Transport for NSW

Waitara Station Upgrade

Review of Environmental Factors

NSW GOVERNMENT

Artist's impression of the proposed Waitara Station Upgrade, subject to detailed design

March 2022

Waitara Station Upgrade Review of Environmental Factors

Transport Access Program
Ref – 6662376

Contents

Document control	
Status:	Final
Date of issue:	March 2022
Version:	2
Document author:	AECOM
Document reviewers:	Transport for NSW
© Transport for NSW	

Figures

Tables

Abbreviations

Term	Meaning
AHIMS	Aboriginal Heritage Information Management System
ARI	Average Recurrence Interval
ASS	Acid Sulfate Soils
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
CPTED	Crime Prevention Through Environmental Design
CTMP	Construction Traffic Management Plan
DDA	*Disability Discrimination Act 1992* (Cwlth)
DPE	NSW Department of Planning and Environment
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
ECM	Environmental Controls Map
EES	NSW Environment, Energy, and Science (Division of Department of Planning and Environment)
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 2021* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
FM Act	*Fisheries Management Act 1994* (NSW)
GREP	Government Resource Efficiency Policy
Heritage Act	*Heritage Act 1977* (NSW)

Term	Meaning
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2000).
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)
IS rating	Infrastructure Sustainability rating under ISC rating tool (v 1.2)
ISC	Infrastructure Sustainability Council
LCVIA	Landscape Character and Visual Impact Assessment
LCZ	Landscape Character Zones
LEP	Local Environmental Plan
LGA	Local Government Area
LSPS	Local Strategic Planning Statement
MNES	Matters of National Environmental Significance
NCA	Noise Catchment Area
NML	Noise Management Level
NPfI	*Noise Policy for Industry*
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	(former) NSW Office of the Environment and Heritage
PA system	Public Address system
PDP	Public Domain Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Roads Act	*Roads Act 1993* (NSW)
SEED	Sharing and Enabling Environmental Data
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
SoHI	Statement of Heritage Impact
SSE	Station Services Equipment
TAHE	Transport Asset Holding Entity of New South Wales

Term	Meaning
TCP	Traffic Control Plan
TMP	Traffic Management Plan
TPZ	Tree Protection Zone
UDP	Urban Design Plan
VDV	Vibration Dose Value
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
WIRES	Wildlife Information, Rescue and Education Service
WM Act	*Water Management Act 2000* (NSW)
REWMP	Resource Efficiency and Waste Management Plan

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 would occur on average once every 100-years.
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
Determining Authority	A Minister or public authority on whose behalf an activity is to be carried out or public authority whose approval is required to carry out an activity (under the EP&A Act).
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 section 193 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.
Kiss and ride bay	A kiss and ride bay allows for quick entry and exit by vehicles, which helps minimise congestion and risk when used properly. These types of bays operate under the same conditions as no parking zones, which means a customer may stop to drop off or pick up others for a maximum of two minutes. They are required to remain in, or within three metres of their vehicle (Service NSW, 2016).
Noise sensitive receiver	In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (e.g. schools, TAFE colleges), health care facilities (e.g. nursing homes, hospitals), recording studios and places of worship/religious facilities (e.g. churches).
NSW Trains	From 1 July 2013, NSW Trains became the new rail provider of services for regional rail customers.
Opal card	The integrated ticketing smartcard introduced by Transport for NSW.
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).

Term	Meaning
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act - in this instance, Transport for NSW.
Rail shutdown	Shutdown is the term used by railway building/maintenance personnel to indicate that they have taken possession of the track (usually a section of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Reasonable	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.
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 Ground Surface Indicators (tactiles) 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 Waitara Station Upgrade.
Vegetation Offset Guide	The Transport for NSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of Section 5.5 of the EP&A Act. 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 Waitara 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 Waitara Station Upgrade (the Proposal) would 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 involve:

- construction of a new pedestrian underpass at the northern end of the platform to provide a new accessible station entrance
- installation of two new lifts at the new northern station entrance including a lift from the commuter car park to the underpass and a lift from the underpass to the platform, including associated landings, canopies and support structures
- construction of new platform stairs and associated canopy to provide access from the new pedestrian underpass to the station platform
- construction of a new northern station entrance including a lift entrance and entrance stairs from the commuter car park off Waitara Avenue, and an eastern entrance from Alexandria Parade
- construction of an accessible pedestrian footpath on Alexandria Parade connecting to a new pedestrian crossing on Alexandria Parade
- provision of seating and wheelchair spaces at the two boarding assistance zones (BAZ) and installation of one canopy on the station platform
- modifications to the station building to provide additional Station Services Equipment (SSE)
- reconfiguration of the existing toilet facilities in the station building to provide a new family accessible toilet and new unisex ambulant toilet
- modifications to the commuter car park including relocation of the turning circle, relocation of two accessible parking spaces and provision of kiss and ride bays
- modifications to the parking on Alexandria Parade to provide a new station entrance including provision of two new accessible parking spaces adjacent to the new station entrance
- ancillary work including platform stabilisation and regrading, station power supply upgrade, protection and relocation of existing services and utilities, installation of new services and utilities, new or reinstatement of Tactile Ground Surface Indicators (tactiles) where required, handrails and fencing, new ticketing facilities including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

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

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

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

Subject to approval, construction is expected to commence in mid 2022 and take up to 18 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF. An overview of the Proposal is shown in Figure ES-1.

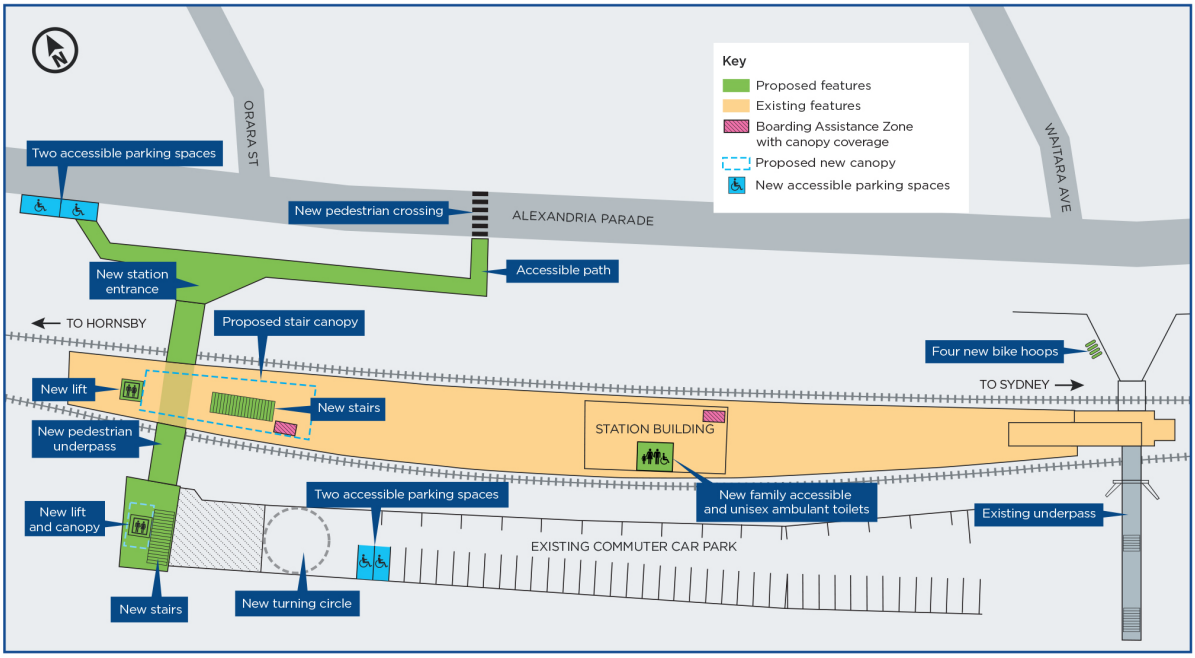


Figure ES-1 Key elements of the Proposal (indicative only - subject to detailed design)

Need for the Proposal

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

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

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

Community and stakeholder consultation

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

Early community engagement was undertaken between 23 September and 7 October 2020 to provide the community an opportunity to have their say on the early concept design. A new concept design was developed in 2021 in response to extensive requests to provide an additional station entry point during this early engagement.

Further engagement on the new concept design was undertaken between 8 November and 22 November 2021 to provide the community with an opportunity to have their say on the new

design. The feedback received from the community was provided to the project team for consideration and to help inform the planning process.

Community consultation activities for the Proposal would be undertaken during the public display period of this REF with the public invited to submit feedback to help Transport understand what is important to customers and the community. The REF would be displayed for a period of two weeks. Further information about these specific consultation activities is included in Section 5.4 of this REF.

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

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

Transport 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 receive planning approval, the community would be kept informed throughout the duration of the construction period. Figure ES-2 shows the planning approval and consultation process for the Proposal.

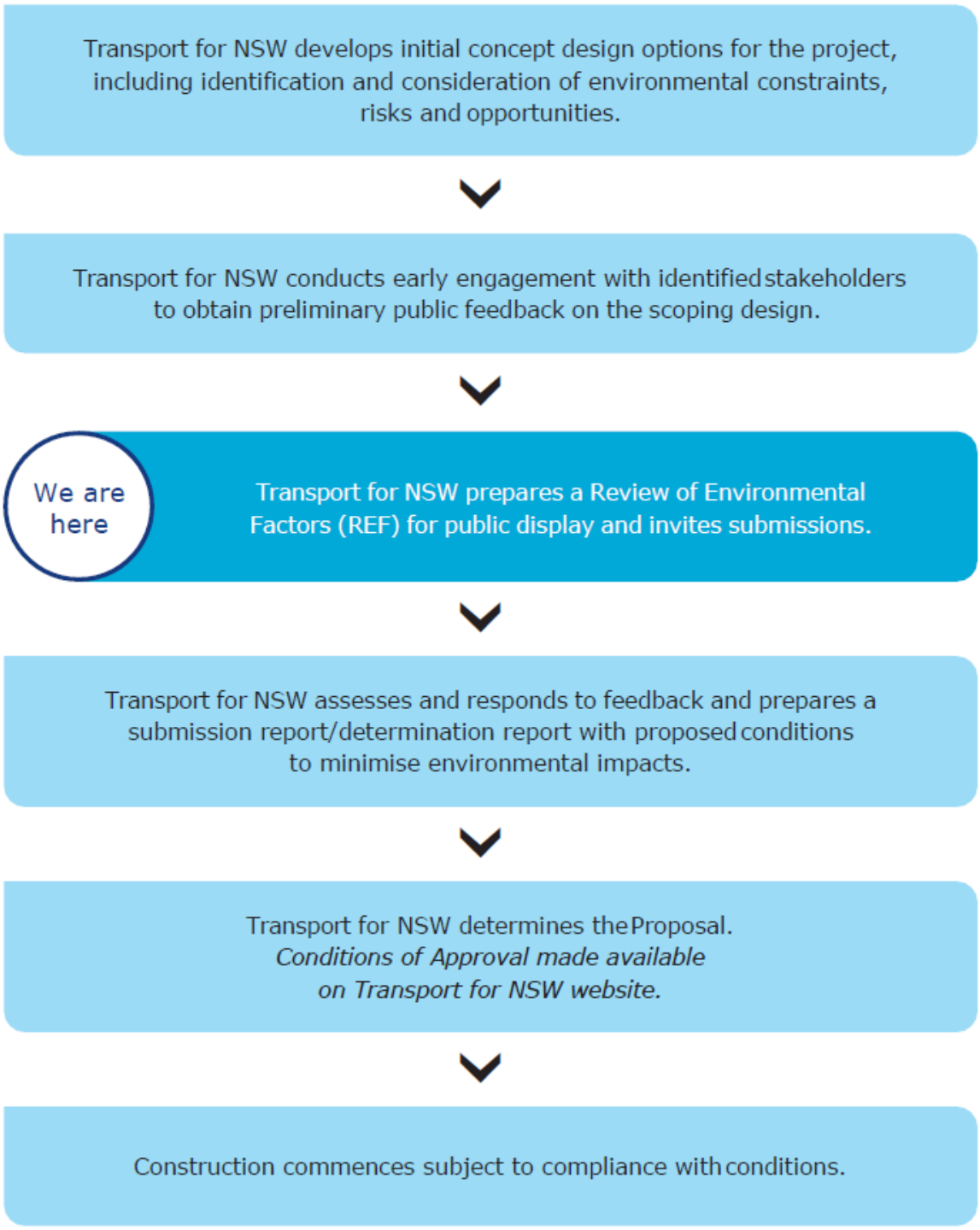


Figure ES-2 Planning approval and consultation process for the Proposal

Environmental impact assessment

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

The Proposal would provide the following benefits:

- an additional station entrance at the northern end of Waitara Station that provides improved and equitable access for customers, including the installation of lifts, new stairs, relocated and additional accessible parking, upgraded accessible paths and BAZ and a new pedestrian crossing on Alexandria Parade
- improved station amenity and safety for customers at the station resulting from the installation of the family accessible toilet, unisex ambulant toilet, new lighting and CCTV
- improved accessibility for cyclists with the provision of new bike hoops
- retention of the existing station entrance and minimised impact to existing heritage fabric.

The likely key impacts of the Proposal are as follows:

- temporary changes to vehicle and pedestrian movements in and around the station during construction including temporary footpath diversions
- temporary changes to parking arrangements (including informal kiss and ride) around the station precinct during construction
- permanent loss of parking on Alexandria Parade for the new northern station entrance and pedestrian crossing
- permanent loss of parking in the Waitara Avenue commuter car park for the new station entrance on the western side of the station
- visual changes due to the introduction of new elements into the existing environment including the new pedestrian underpass, two new lifts and associated canopies and changed parking conditions
- temporary noise and vibration impacts during construction
- impacts to the heritage character of the station through the installation of the new lifts and modifications to the station platform.

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 section 171 of the EP&A Regulation, to ensure that Transport takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The detailed design of the Proposal would also be designed in accordance with the Infrastructure Sustainability Council (ISC) Infrastructure Sustainable (IS) Rating Tool (v 1.2) taking into account the principles of ecologically sustainable development (ESD).

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

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

A photomontage of the Proposal is shown in Figure ES-3. This photomontage shows the indicative configuration of the new pedestrian underpass from Alexandria Parade. The final height of the walls to the underpass would be subject to detailed design and the design and materials for the underpass forecourt would be further refined through detailed design.

Figure ES-3 Photomontage of the Proposal at Waitara Station (indicative only - subject to detailed design)

1 Introduction

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

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

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

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

1.1.2 The Proposal

The key features of the Proposal are summarised as follows:

- construction of a new pedestrian underpass at the northern end of the platform to provide a new accessible station entrance
- installation of two new lifts at the new northern station entrance including a lift from the commuter car park to the underpass and a lift from the underpass to the platform, including associated landings, canopies and support structures
- construction of new platform stairs and associated canopy to provide access from the new pedestrian underpass to the station platform
- construction of a new northern station entrance including a lift entrance and entrance stairs from the commuter car park off Waitara Avenue, and an eastern entrance from Alexandria Parade
- construction of an accessible pedestrian footpath on Alexandria Parade connecting to a new pedestrian crossing on Alexandria Parade
- provision of seating and wheelchair spaces at the two boarding assistance zones (BAZ) and installation of one canopy on the station platform
- modifications to the station building to provide additional SSE
- reconfiguration of the existing toilet facilities in the station building to provide a new family accessible toilet and new unisex ambulant toilet
- modifications to the commuter car park including relocation of the turning circle, relocation of two accessible parking spaces and provision of kiss and ride bays
- modifications to the parking on Alexandria Parade to provide a new station entrance including provision of two new accessible parking spaces adjacent to the new station entrance

- ancillary work including platform stabilisation and regrading, station power supply upgrade, protection and relocation of existing services and utilities, installation of new services and utilities, new or reinstatement of tactiles where required, handrails and fencing, new ticketing facilities including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

Subject to planning approval, construction is expected to commence in mid 2022 and take up to 18 months to complete.

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

1.2 Location of the Proposal

The Proposal would involve upgrade work to Waitara Station, which is located in the suburb of Waitara in the Hornsby Shire local government area (LGA) about 20 kilometres from Sydney's Central Business District (CBD). The location of the station and its regional context is shown in Figure 1-1.

Waitara Station consists of a single island platform and is serviced by the T1 North Shore and Western Line and T9 Northern Line. It is bound by Alexandria Parade to the east and the Pacific Highway to the west, with an underpass crossing under the rail corridor and providing pedestrian access to the station. The Proposal includes upgrades to Waitara Station on land owned by the NSW Transport Asset Holding Entity, and managed by Sydney Trains within the station precinct, with some work also proposed along the station entrances which are managed by Hornsby Shire Council.

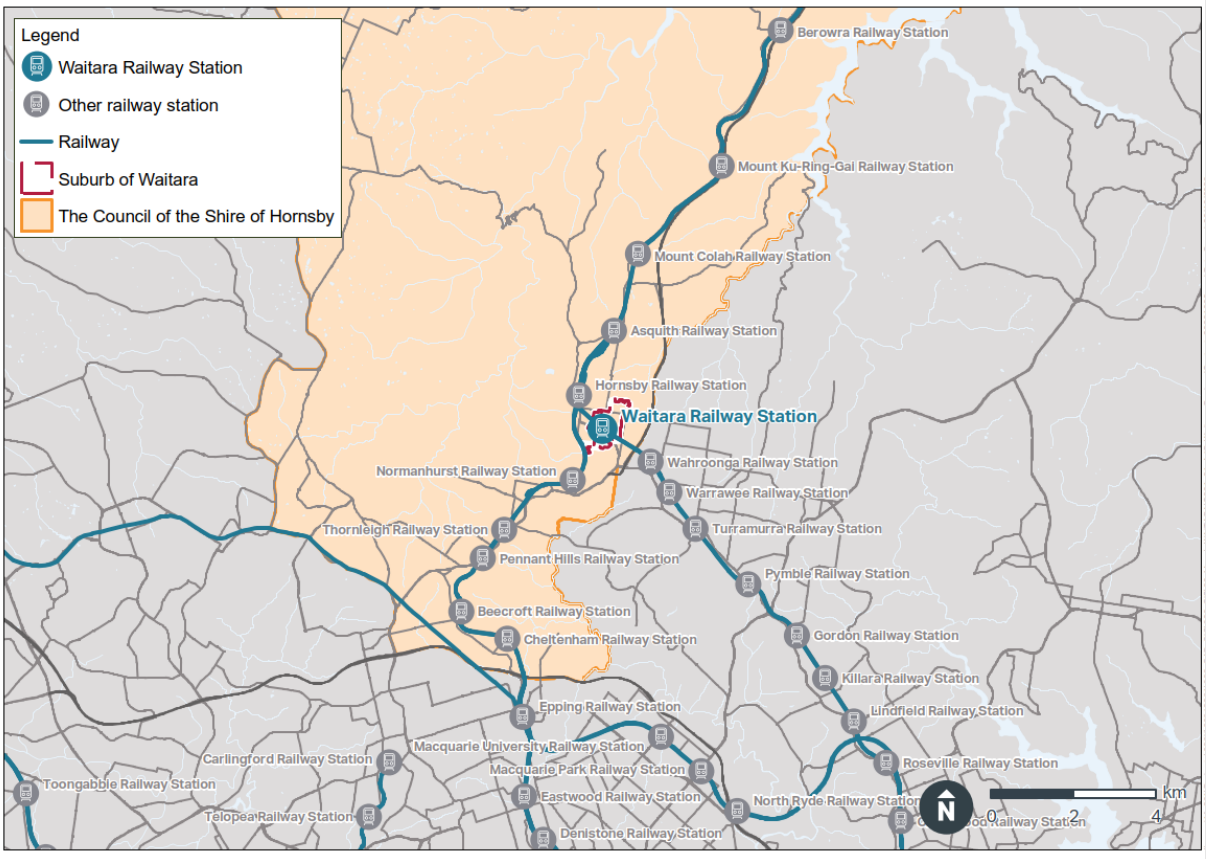


Figure 1-1 Regional context

1.3 Existing infrastructure and land uses

1.3.1 Waitara Station

Waitara Station has a single island platform which is accessed from Waitara Avenue from the west and Alexandria Parade from the east. Access to the station is via a brick lined pedestrian underpass which connects to the southern end of the platform with a set of stairs leading from the underpass up to the platform. Pedestrian access to the underpass is from street level on the eastern side of the station and via a set of stairs on the western side of the station.

There is a single building on the platform which consists of a ticket office, office, storeroom, and male and female toilets. Platform 1 provides services to Central Station and Platform 2 provides services to Hornsby/Berowra. Waitara Railway Station Group is listed on the RailCorp Section 170 Heritage and Conservation Register as holding local heritage significance.

A commuter car park is accessed from Waitara Avenue), which is next to the rail line. There are about 70 parking spaces at this car park, two of which are currently designated as accessible parking spaces. There is also about 535 metres of rear to kerb parking available along Alexandria Parade that is commonly used to access the station. The nearest bus stop which services the station is located on the Pacific Highway, 60 metres west of the station. An existing kiss and ride bay is located on Alexandria Parade, opposite the southern station entrance. There are bicycle locker facilities in the commuter car park, providing secure bicycle parking.

Waitara Station Group is listed on the NSW Transport Asset Holding Entity (TAHE) Section 170 Heritage and Conservation Register (s170 register). Waitara Station is considered to have local significance because like many areas, although there was an established community in Waitara by the late 1880s, the construction of the railway encouraged rapid subdivision and the development of the area. The platform building, island platform and underpass (subway) are representative of structures built at Sydney railway stations particularly between the period between 1909 and 1917 retain heritage significance in terms of integrity and representativeness.

1.3.2 Land uses

The suburb of Waitara consists mostly of houses, townhouses, apartment buildings, seniors housing and nursing homes, commercial, businesses and light industrial land uses.

The local area to the west of the station primarily consists of commercial premises such as car dealerships, cafes and restaurants on Waitara Avenue (west) and Pacific Highway, as well as medium density residential properties, primarily consisting of seniors housing developments.

The local area east of the station is mainly apartment buildings with public recreation areas associated with small parks and Waitara Oval. Asquith Rugby Leagues Club (Magpies) is also located opposite the station to the east on Alexandria Parade.

There is a variety of land uses within an 800 metre radius of the station, including three high schools (Barker College, Hornsby Girls High School and St Leo's Catholic College), two primary schools (Our Lady of the Rosary Catholic Primary School and Waitara Public School), houses, townhouses, seniors living communities and nursing homes, restaurants and Hornsby Westfield Shopping Centre.

The location of the Proposal and surrounding key features is shown in Figure 1-2.

Photographs of the existing station and surrounds are provided in Figure 1-3 to Figure 1-6.

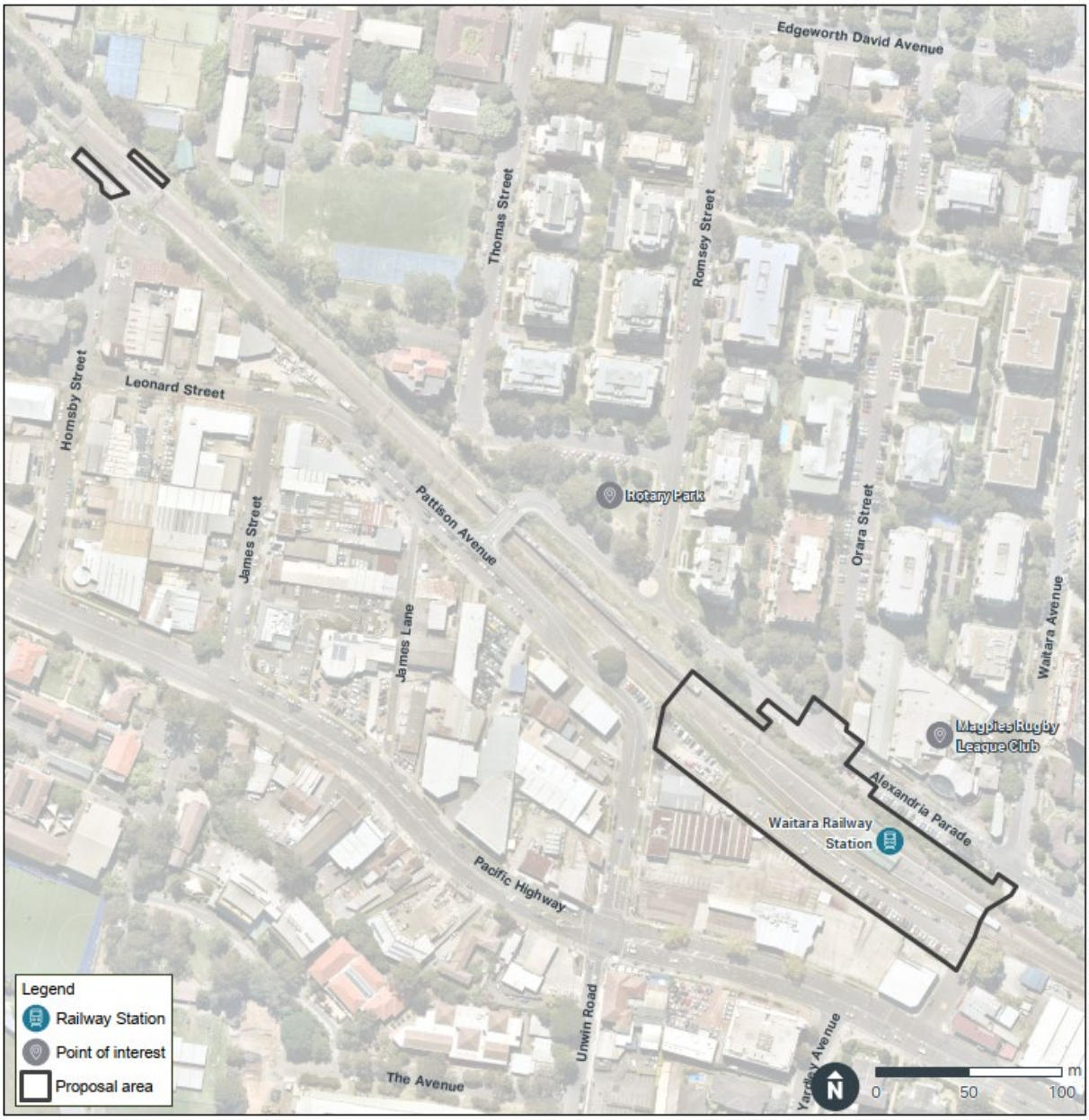


Figure 1-2 Site locality map

Figure 1-3 Platform building at Waitara Station

Figure 1-4 View west from the platform building

Figure 1-5 Location of proposed new station entrance on Alexandria Parade

Figure 1-6 Location of proposed new station entrance from the commuter car park

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by AECOM Australia Pty Ltd on behalf of Transport to assess the potential impacts of the Waitara Station Upgrade. For the purposes of these work, Transport 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 section 171 of the *Environment Planning and Assessment Regulation 2021* (EP&A Regulation).

This assessment has also considered the 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 Australian Department of Agriculture, Water and the 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, having regard to the objectives of the Transport Access Program and the specific objectives of the Proposal. This chapter also provides a summary of the options that have been considered during development of the Proposal and why the preferred option has been chosen.

2.1 Strategic justification

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

The Waitara Station Upgrade, the subject of this REF, forms part of the Transport Access Program. This program is designed to drive a stronger customer experience outcome to deliver seamless travel to and between modes, encourage greater public transport use and better integrate station interchanges for all customers, with the role and function of enhancing town centres associated with train stations within the metropolitan area and developing urban centres in regional areas of NSW.

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

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

Policy / Strategy	Overview	How the Proposal aligns
Future Transport Strategy 2056 (Transport for NSW, 2018b)	*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. *Future Transport 2056* identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport. Customer outcomes relevant to the Proposal includes: • a safe transport system for every customer with the aim for zero deaths or serious injuries on the network by 2056 • fully accessible transport for all customers.	The Proposal aligns with the *Future Transport Strategy 2056* by providing accessible services for people who find it difficult to access public transport services. New lifts, access paths and an underpass would provide a more physically accessible and safe network allowing greater choice for people with mobility constraints to access public transport. Greater accessibility would also mean better connections to places and opportunities for employment, education, business and recreation.
Disability Inclusion Action Plan (2018-2022) (Transport for NSW, 2017a)	The *Disability Inclusion Action Plan 2018-2022* was developed by Transport in consultation with the Accessible Transport Advisory Committee, which consists of representatives from peak disability and ageing organisations within NSW. The Disability Inclusion Action Plan identifies the challenges, the achievements to date, the considerable undertaking that is required to finish the job and provides a solid and practical	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	Overview	How the Proposal aligns
	foundation for future progress over the next five years.	
Transport Sustainability Plan 2021 (Transport for NSW, 2021)	The *Transport Sustainability Plan 2021* ensures Transport is being environmentally and socially responsible in the way we work, embedding sustainability in decision making and building a transport system that is resilient to future shocks and stresses. The plan sets the sustainability vision for a New South Wales where every journey is people and planet positive. Transport developed eight focus areas which address the most important sustainability aspects associated with the activities of Transport, each supported by sustainability goals, where we will concentrate our attention and resources. The 2021 plan identifies four key sustainability initiatives and an accompanying set of actions for 2021-22.	The Proposal furthers Transport's commitment to being environmentally and socially responsible by providing equitable access to the station and preserving heritage items. The Proposal would also encourage a reduction in private vehicle use and increase to the accessibility of public transport services.
Transport Future Energy Strategy and Future Energy Action Plan (Transport for NSW, 2020)	The *Future Energy Strategy* outlines Transport's commitment to securing our transport energy needs from sustainable sources and supports the transport sector's transition to net zero emissions by 2050. The *Future Energy Action Plan* defines the near-term initiatives for achieving the future energy strategy objectives. Transport will continue to update the Future Energy Action Plan and will monitor and report on our progress in delivering outcomes.	The Proposal aligns with this Plan as it would consider the use of renewable energy sources in both construction and operation, such as solar panels as a back-up power supply or certified Green Power as a general energy source.
NSW Waste and Sustainable Materials Strategy 2041 (NSW Department of Planning and Environment, 2021)	The *NSW Waste and Sustainable Materials Strategy 2041*, Stage 1: 2021-2027 outlines the environmental and economic opportunities available in how we manage our waste. The Strategy sets out the actions through to 2027.	The Proposal aligns with this Strategy as it aims to implement circular economy concepts throughout the design and construction phases.
A Metropolis of Three Cities - Greater Sydney Region Plan (Greater Sydney Commission, 2018)	The *Greater Sydney Region Plan* is the NSW Government's 40-year land use plan for Sydney. It establishes a vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City. The vision brings new thinking to land use and transport patterns to boost Greater Sydney's liveability. To deliver a 30-minute city, connections to existing infrastructure need to be improved. Importantly, transport corridors need to be upgraded to ensure efficiency and accessibility to accommodate the projections in population growth across Sydney.	The Proposal is located between the Eastern Harbour City and the Central River City and has been developed to improve the accessibility of Waitara Station, providing easier access to the Sydney CBD, Hornsby and surrounding areas for customers.

Policy / Strategy	Overview	How the Proposal aligns
North District Plan (Greater Sydney Commission, 2018a)	The *North District Plan* is a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year vision for Greater Sydney. It is a guide for implementing A Metropolis of Three Cities, at a district level and is a bridge between regional and local planning. Waitara Station is located on the boundary between the Eastern Harbour City and the Central River City. Within the more detailed plans for the economic, social and environmental visions in Sydney, Waitara is part of the North District Plan. The vision for Greater Sydney as a 30 minute city means residents in the North District would have quicker and easier access to a wider range of jobs, housing types and activities a large part of the, and its economy leans to the Harbour CBD. The vision would improve the District's lifestyle and environmental assets.	The Proposal has been developed to improve the accessibility of Waitara Station, providing easier access to the CBD and surrounding areas for customers.
Building Momentum – State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)	*The State Infrastructure Strategy 2018–2038* builds on the NSW Government's major long-term infrastructure plans over the last seven years. The strategy sets out the government's priorities for the next 20 years and combined with the *Future Transport Strategy 2056* brings together infrastructure investment and land-use planning for our cities and regions. Public transport is viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal.	The Proposal supports investment in rail infrastructure and aligns with the need to continue to provide urban public transport to support Sydney's increasing population. The Proposal is also consistent with overall aims and objectives of the *Future Transport Strategy 2056* to improve transport infrastructure across NSW.
NSW: Premier Priorities *(NSW Government, 2019)* *https://www.nsw.gov.au/improving-nsw/premiers-priorities/*	In June 2019, 14 new Premier's Priorities were announced that would allow the Government to measure and deliver in areas where NSW can do better. The key policy priorities, include the following: • a strong economy • highest quality education • well-connected communities with quality local environments • putting customer at the centre of everything we do • breaking the cycle of disadvantage A key Premier Priority is the delivery of infrastructure, specifically noting the importance of every NSW community receiving its fair share of local projects and extra services.	The Proposal is aligned with the Premiers' Priorities as it is a part of the wider delivery of key infrastructure projects across NSW.

Policy / Strategy	Overview	How the Proposal aligns
Hornsby Local Strategic Planning Statement (LSPS) *(Hornsby Shire Council, 2020)*	The Hornsby LSPS sets up the 30-year vision for land use in the Hornsby area and outlines how this change will be managed. The key priorities emphasised in the Hornsby LSPS relevant to the Proposal include: • P3 - responding to climate change with an active strategy to reduce carbon emissions and manage energy, waste and water efficiently • P5 - enhancing, protecting, conserving and promoting our natural, built and cultural heritage • P5 - revitalising the Hornsby Town Centre • P8 - supporting sustainable economic growth based on the Shire's built and natural assets, infrastructure and locational advantages • P10 - promoting the '30-minute City' by improving the walkability, connectivity and accessibility of our centres and neighbourhoods. Within the Hornsby LSPS, Waitara is identified as a growth area and a housing strategy precinct.	The Proposal is aligned with the Hornsby LSPS as it responds to key priorities and implementation actions by: • P3 - increasing the accessibility of Waitara Station and the railway services to all persons as a method of travel, which is a lower producer of carbon emissions than private motor vehicles • P5 - conserving the heritage value of the railway station during construction and operation • P5 - investing in rail infrastructure at Waitara Station and providing active transport facilities to promote the use of active transport to and from Hornsby town centre • P8 - investing in rail infrastructure accessible to all as a sustainable method of travel as opposed to private vehicle usage • P10 – improving bicycle parking and accessible parking spaces at the station.

2.2 Objectives of the Transport Access Program

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

- stations that are accessible to those with disabilities, that are less mobile, and parents/carers with prams and customers with luggage
- modern buildings and facilities for all modes that meet the needs of a growing population
- modern interchanges that support an integrated network and allow seamless transfers between all modes for all customers
- signage improvements so customers can more easily use public transport and transfer between modes at interchanges
- other improvements and maintenance such as painting, new fencing and roof replacements.

2.3 Objectives of the Proposal

The specific objectives of the Waitara Station Upgrade are to:

- provide a station that is accessible to those with disabilities, that are less mobile and parents/carers with prams and customers with luggage
- improve customer experience (better interchange facilities and visual appearance)
- improve integration with the surrounding precinct and other modes of transport
- improve customer safety
- improve wayfinding in and around the station
- respond to the heritage values of the station
- improve customer amenity
- maintain corridor access/pedestrian links between Alexandria Parade and Waitara Avenue (west).

2.4 Design development

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

2.5 Alternative options considered

The four options had a number of common elements including; installation of new lifts to the platform, new accessible parking spaces and a kiss and ride bay, refurbishment of the existing platform buildings and facilities (with new family accessible and ambulant toilet), upgraded footpaths to the station and ancillary work such as utility relocations, improvements to wayfinding signage, lighting and CCTV. The key differences between Options 1 to 3 involved the placement of lift structures, while Option 4 proposes the provision of new accessible infrastructure at the northern end of the platform.

2.5.1 Option 1

Option 1 achieves compliance to DSAPT standards through the provision of:

- one lift to the existing pedestrian underpass to the platform level
- a new walkway connecting the lift landing to the existing platform
- an extension on the western end of the platform including tactiles and a fence
- a pedestrian ramp on the west side of the rail corridor to provide access from the street level to the pedestrian underpass, including modification of the existing stairs to allow a flat landing at the end of the connecting ramp
- upgrade of all stairs with new compliant hand railing, tactiles and nosing
- relocation of the existing bin storage area, upgrade and relocation of the existing non-compliant accessible car parking bays, a new pedestrian crossing located at the commuter car park entry and lining and tactiles upgrades to the platform.

2.5.2 Option 2

Option 2 achieves compliance to DSAPT standards through the provision of:

- two lifts, one from the existing pedestrian underpass to the platform level with a new walkway to connect the lift landing to the existing platform, and a second lift on the western side of the rail corridor to connect the commuter car park to the pedestrian underpass
- removal of the bricks at the top of the platform stair parapet and addition of a new glazed screen to the top of the brick wall
- modification of the existing southern entry stairs to allow a flat landing connection to the second lift. Due to the lack of available circulation space on the eastern end of the platform, an extension would be required on the western end of the platform and would include tactiles and a fence
- upgrade of all stairs with new compliant handrail, tactiles and nosing
- relocation and upgrade of the existing bin storage area and accessible car parking bays.

2.5.3 Option 3

Option 3 achieves compliance to DSAPT standards through the provision of:

- a new pedestrian bridge with two stair runs and two lifts to connect the west side of the rail corridor to the platform. The first lift would connect the platform to the bridge and the second lift would connect the bridge to the commuter car park and the existing pedestrian underpass below
- modification of the existing stairs to allow access to the new pedestrian underpass lift connection
- upgrade of all stairs with new compliant handrail, tactiles and nosing
- relocation and upgrade of the existing bin storage area and accessible car parking bays.

2.5.4 Option 4 (preferred option)

Option 4 achieves compliance to DSAPT standards through the provision of:

- a new pedestrian underpass at the northern end of the platform to provide a new accessible station entrance, in addition to the retention of the existing station entrance
- two new lifts at the new northern station entrance including a lift from the commuter car park to the underpass and a lift from the underpass to the platform, including associated landings, canopies and support structures
- new platform stairs and associated canopy to provide access from the new pedestrian underpass to the station platform
- a new northern station entrance including a lift entrance and entrance stairs from the commuter car park off Waitara Avenue, and an eastern entrance from Alexandria Parade
- an accessible pedestrian footpath on Alexandria Parade connecting to a new pedestrian crossing on Alexandria Parade
- seating and wheelchair spaces at the two BAZ and installation of an associated canopy on the station platform

- reconfiguration of the existing toilet facilities in the station building to provide a new family accessible toilet and new unisex ambulant toilet
- modifications to the commuter car park including relocation of the turning circle, relocation of two accessible parking spaces and provision of kiss and ride bays
- modifications to the parking on Alexandria Parade to provide a new station entrance including provision of two new accessible parking spaces adjacent to the new station entrance.

2.5.5 The 'do-nothing' option

Under a 'do-nothing' option, existing access to the platform would remain the same and there would be no changes to the way the station currently operates.

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

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

2.5.6 Assessment of identified options

The options were assessed in a multi criteria analysis that included factors such as accessibility, facility operations and maintenance, customer experience, transport integration, urban design, precinct planning, environment, sustainability and heritage to select a preferred option.

2.6 Justification for the preferred option

In 2020, Option 2 was identified as a potential solution to best meet the specific objectives of the Proposal (as outlined in Section 2.3) and the wider Transport Access Program. This option proved to be the less disruptive design and was most cost-effective to construct, operate and maintain.

Community feedback received for Option 2 identified a preference to deliver a new station entrance, separate to the existing station entrance. In addition, Option 2 would have also involved modification of heritage-significant brickwork associated with the subway wall and existing retaining wall at the existing entrance which would have impacted the heritage significance of Waitara Station. Refer to Section 5.1 for details of the consultation undertaken for Option 2, feedback received and subsequent design changes.

Having regard for the feedback received in relation to Option 2, Option 4 was developed. A multi criteria analysis shows that Option 4 scores the highest in deliverability, customer experience, transport integration and urban design and precinct planning categories. Option 4 (preferred option) would include the provision of a new accessible pedestrian underpass, new station entrance and two new lifts located at the northern end of the platform providing alternative access to Waitara Station, with the existing station entrance remaining. The proposed location of this infrastructure would avoid the requirement to modify the southern entrance brickwork, therefore reducing potential impacts to the heritage significance of Waitara Station.

3 Proposal description

Chapter 3 describes the Proposal and summarises key design parameters, construction method, and associated infrastructure and activities. The description of the Proposal is based on a concept design prepared by Gartner Rose, dated January 2022 and is subject to detailed design.

3.1 The Proposal

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

The Proposal would include the following key elements:

- construction of a new pedestrian underpass at the northern end of the platform to provide a new accessible station entrance
- installation of two new lifts at the new northern station entrance including a lift from the commuter car park to the underpass and a lift from the underpass to the platform, including associated landings, canopies and support structures
- construction of new platform stairs and associated canopy to provide access from the new pedestrian underpass to the station platform
- construction of a new northern station entrance including a lift entrance and entrance stairs from the commuter car park off Waitara Avenue, and an eastern entrance from Alexandria Parade
- construction of an accessible pedestrian footpath on Alexandria Parade connecting to a new pedestrian crossing on Alexandria Parade
- provision of seating and wheelchair spaces at the two BAZ and installation of a canopy on the station platform
- modifications to the station building to provide additional Station Services Equipment (SSE)
- reconfiguration of the existing toilet facilities in the station building to provide a new family accessible toilet and new unisex ambulant toilet
- modifications to the commuter car park including relocation of the turning circle, relocation of two accessible parking spaces and provision of kiss and ride bays
- modifications to the parking on Alexandria Parade to provide a new station entrance including provision of two new accessible parking spaces adjacent to the new station entrance
- ancillary work including platform stabilisation and regrading, station power supply upgrade, protection and relocation of existing services and utilities, installation of new services and utilities, new or reinstatement of Tactile Ground Surface Indicators (tactiles) where required, handrails and fencing, new ticketing facilities including additional Opal card readers, improvement to station communication systems (including CCTV cameras) and wayfinding signage.

Figure 3-1 shows the general layout of key elements for the Proposal.

Figure 3-2 shows a photomontage of the Proposal. The final height of the walls to the underpass would be subject to detailed design and the design and materials for the underpass forecourt would be further refined through detailed design.

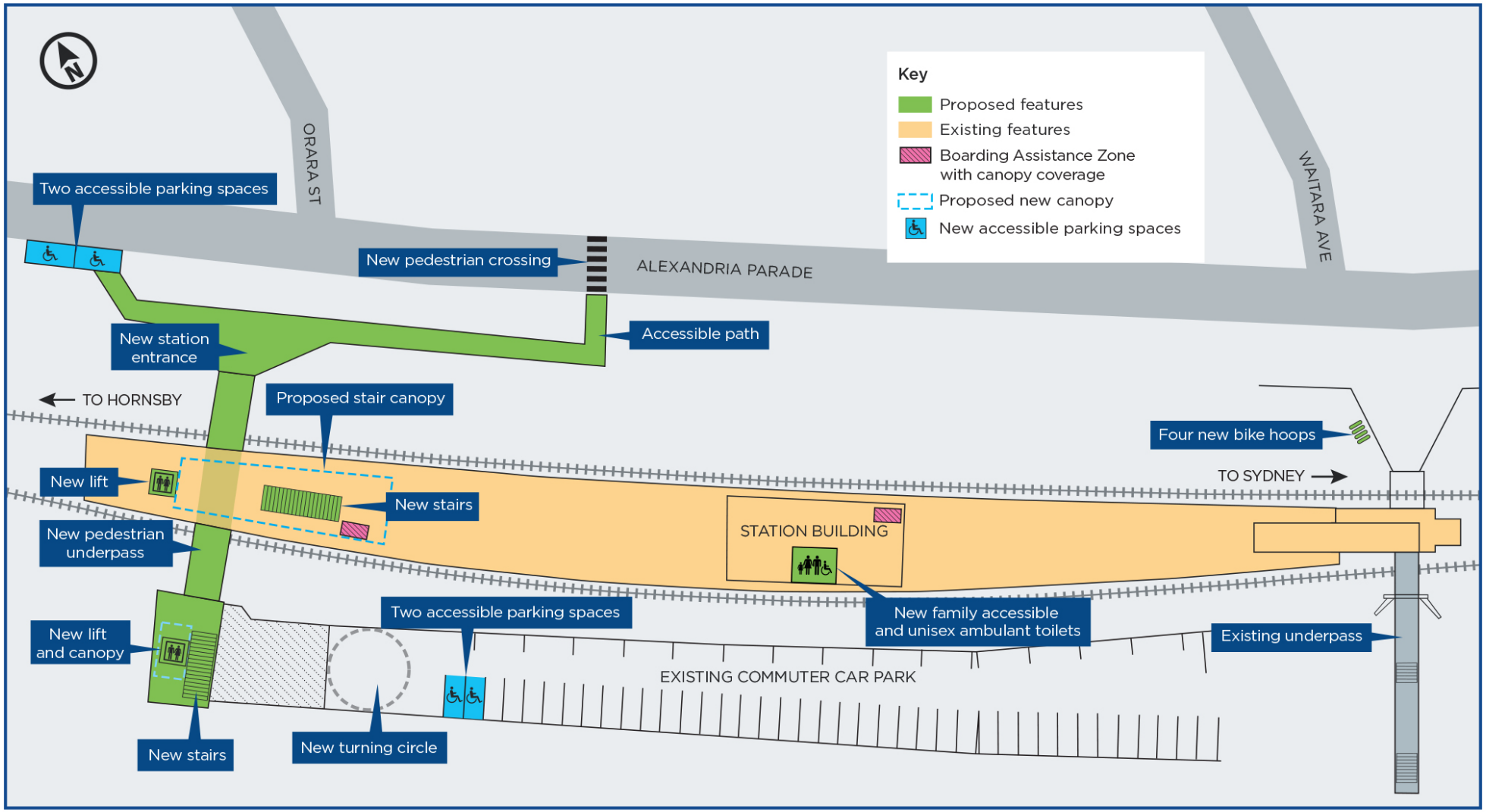


Figure 3-1 Key elements of the Proposal (Indicative only, subject to detailed design)

Figure 3-2 Photomontage of the proposed view towards Waitara Station from Alexandria Parade (Indicative only, subject to detailed design)

3.2 Scope of work

This section provides a more detailed explanation of the Proposal which would improve accessibility at Waitara Station.

3.2.1 Station upgrade

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

- construction of a new pedestrian underpass at the northern end of the platform to provide an additional station entrance including excavation underneath the existing railway track beneath the station platform
- construction of new station entrances and installation of two new lifts (and lift landings) at the northern end of the station including:
    - construction of a new station entrance including new entrance stairs and installation of a new lift to provide access from the commuter car park off Waitara Avenue to the new pedestrian underpass
    - construction of a new station entrance including an accessible pedestrian footpath on Alexandria Parade connecting to a new pedestrian crossing on Alexandria Parade
    - installation of a new lift to provide access from the new pedestrian underpass to the station platform
    - installation of weather protection canopies at the lift landings.
- construction of new platform stairs at the northern end of the station including:
    - excavation of the station platform
    - installation of new platform stairs to provide access from the new pedestrian underpass to the station platform
    - installation of an associated canopy, provision of handrails, tactiles and non-slip stair edging.
- provision of seating and wheelchair spaces at the two BAZs and installation of a canopy on the platform
- modifications to the station building to provide additional SSE.
- reconfiguration of the existing female toilets into one unisex ambulant toilet including widening of the door to meet accessibility requirements
- reconfiguration of the existing male toilets into one new unisex family accessible toilet including:
    - lowering the floor to the family accessible toilet to allow for level access
    - relocating an internal wall
    - removing the existing door and provision of a new door to achieve the required clearance width
- regrading the platform as required to achieve compliant gradients for accessible pathways.

3.2.2 Interchange facilities

Interchange upgrade work to improve connectivity within the station precinct would include:

- upgrades to the interchange facilities at the new northern entrance on Alexandria Parade including:
    - provision of a new pedestrian crossing
    - provision of an accessible footpath from the new station entrance to the new pedestrian crossing
    - provision of two accessible parking spaces near the new station entrance
- upgrades to the interchange facilities at the new northern entrance in the commuter car park including:
    - relocation of the turning circle located at the end of the commuter car park to accommodate the new station entrance
    - relocation of two existing accessible parking spaces closer to the new entrance
    - provision of kiss and ride bays
    - provision of an accessible footpath from the accessible parking spaces to the new lift
- provision of four new bike hoops at the existing station entrance on Alexandria Parade.

3.2.3 Ancillary work

Additional ancillary work within the station precinct including:

- electrical and power supply upgrade work including a new substation and padmount, a new Installation Main Switch Board (IMSB) room, two new underground to overhead poles and installation of two new Combined Services Routes (CSRs)
- stormwater drainage upgrade work on the eastern side of the railway track
- upgrades to lighting and CCTV cameras to comply with the DSAPT
- protection and relocation of services and utilities as required
- new fencing and upgrades to existing fencing where required by the new installation
- upgrades to the public address system, including relocating existing speakers and extending the system to the new lift areas
- other work including installation of new opal card readers and wayfinding signage
- new tactiles on the platform, as required.

3.2.4 Materials and finishes

Materials and finishes for the Proposal have been selected based on the criteria of durability, low maintenance and cost effectiveness, to accord with heritage requirements, to minimise visual impacts, and to be aesthetically pleasing.

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

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

- pedestrian underpass walls – high quality finishes
- new station entrance walls – high quality finishes, including consideration of opportunities for public art or Aboriginal heritage interpretation
- lift shafts – lower lift shaft concrete, upper lift shaft steel frame with glass infill panels
- lift doors – stainless steel
- lift glass – clear
- lift canopy – consistent with the existing station entrance canopy
- lift ventilation – powder coated steel
- lift roof – steel frame with roof sheeting
- platform – asphalt
- footpath – concrete
- canopy – steel frame with roof sheeting and glass panels as required.

The design would be submitted to Transport's Design Review Panel for independent review before being accepted by Transport. An Urban Design Plan and Landscape Plan (UDLP) would also be prepared by the Contractor, prior to finalisation of detailed design for endorsement by Transport.

3.3 Design development

3.3.1 Engineering constraints

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

Existing structures: the placement and integrity of existing structures needed to be considered during the development of the design – these structures included the existing railway tracks, underground services, the existing underpass, station platform, station building, stairs and elements of heritage significance, including the ticket booths.

Sydney Trains' 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 railway track, and safe working provisions.

Heritage: the Waitara Railway Station Group has heritage significance at a local level as a station that represents early twentieth century station design. The platform building, island platform and existing underpass are particularly representative of structures built between 1909 and 1917. The Proposal would involve impacts to the Waitara Railway Station Group. Efforts to minimise potential heritage impacts have been considered during the design development for the Proposal, including avoiding impacts to the existing station entrance and underpass. Potential impacts to non-Indigenous heritage are assessed in Section 6.5.

Construction access: cross-corridor access via the existing underpass would be retained throughout construction. Vehicular access to the commuter car park, which is spatially constrained, would be required for certain plant and equipment. A construction compound would be established adjacent to the commuter car park and would be accessed from Romsey Street, however construction vehicle movements through the commuter car park would be required at times to allow through movement of large vehicles. Construction access would also be required off Alexandria Parade for the construction of the underpass and new station entrance. Construction access would also be required to the proposed material storage area at the laydown area to the north of the station, which would be accessed via Hornsby Street (and the rail corridor during possessions). Traffic control measures would be undertaken to manage construction access and continued operation of customer parking at both sides of the station.

Constructability constraints

In addition, the following constructability constraints have influenced the design development of the Proposal:

- installation of the new lifts and pedestrian underpass would require the relocation of several services
- construction of the new platform stair canopy would require installation of underground drainage services beneath the railway track
- compliance with minimum clearance specifications between the top of the pedestrian underpass and above railway tracks.

3.3.2 Design standards

The Proposal would be designed having regard to the following:

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

3.3.3 Sustainability in design

The Proposal is targeting a rating of 'Excellent' using the ISC Infrastructure Sustainability (IS) Rating Scheme (v1.2). The rating scheme provides an independent and consistent methodology for the application and evaluation of sustainability outcomes in infrastructure projects. The sustainability outcomes address environmental, social, economic and governance aspects.

The IS Rating Scheme is grouped into six key themes:

- management and governance
- using resources
- emissions, pollution and waste
- ecology
- people and place
- innovation.

These sustainability themes are divided into 15 performance categories, against which the Proposal would be independently assessed and assigned a rating level.

Circular economy considerations would form part of the design and construction process.

3.4 Construction activities

3.4.1 Work methodology

Subject to approval, construction would be expected to commence in mid 2022 and take up to 18 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with Transport.

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

Table 3-1 Indicative construction staging for key activities

Stage	Activities
Site establishment and enabling work	• survey investigations including examining geophysical, hydrological and contamination conditions • dilapidation surveys identifying and recording the condition and location of buildings, structures and services (including investigation of the crane location) • temporary relocation of services required for construction • establishment of site compound (i.e. erect fencing, site offices, amenities and plant/material storage areas) • establishment of temporary facilities as required (e.g. hoarding, scaffolding, formwork, establishing crane and piling pads, temporary toilets)
New pedestrian underpass	• vegetation removal where required • installation of piling on the platform as well as under and between the railway track for the new pedestrian underpass • removal of railway tracks and sleepers and excavation of platform and railway tracks to provide for the new pedestrian underpass • installation of retaining headwalls and roof slabs • underpass excavation from both sides of the station using small excavator and bobcat to loosen material and progressively remove spoil offsite • installation of structural walls progressively during pedestrian underpass excavation • structural and waterproofing work • pedestrian underpass finishing (including installation of the ceiling, wall finishes, floor tiling and installation of services within the retaining walls)
New northern station entrances	• construction of new entrance stairs and lift access area from the commuter car park • construction of a new accessible pedestrian footpath on Alexandria Parade • pavement re-grading and kerb landing and treatments around the new lift and entrance stairs from the commuter car park and the new footpath on Alexandria Parade

Stage	Activities
New lifts, stairs and platform upgrades	• excavation and installation of piling on the platform for the new platform stairs • removal of excavated material through the new pedestrian underpass during rail shutdowns • installation of formwork and shotcrete roofing to cover the excavated area • construction and installation of lifts, including shaft foundations, the roof, louvres and screens • construction of new platform stairs, including walls, non-slip stair edging, handrails and screens • construction weather protection canopies at the lift landings, including drainage downpipes connecting to the commuter car park • platform regrading to achieve compliant gradients • installation of BAZ seating and wheelchair spaces and an additional canopy • installation of fixtures, tactiles as required, lighting, signage and CCTV cameras
Station building reconfiguration work	• reconfiguration of the existing station building to provide a family accessible toilet and a unisex ambulant toilet • modifications to the station building to provide additional SSE
Interchange work	• construction of a new accessible pedestrian footpath between the new pedestrian crossing on Alexandria Parade and the new station entrance • construction of a new pedestrian crossing on Alexandria Parade • reconfiguration of existing parking spaces to provide two accessible parking spaces on Alexandria Parade • provision of new bike hoops at the existing station entrance on Alexandria Parade • reconfiguration of car parking spaces to provide two accessible parking spaces and two kiss and ride bays in the commuter car park • relocation of the current turning circle in the commuter car park • line-marking and signage for the reconfigured accessible parking spaces and kiss and ride bays on both sides of the station • installation of wayfinding signage and other statutory/regulatory signage • fencing adjustments
Service and utilities upgrade work	• installation of the new substation, transformer and new IMSB room • installation of two new underground to overhead poles • diversion of the existing 11kV overhead cables via the new poles to the new substation • installation of electrical services beneath the railway track via underbore • installation of new drainage infrastructure on the eastern side of the railway track to connect to a new drainage system
Demobilisation, testing and commissioning	• dismantling of existing site compound/hoarding areas • testing electrical, communications and signalling components

3.4.2 Plant and equipment

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

- cranes
- air compressor
- water truck
- concrete pumps
- light construction vehicle
- piling rig
- concrete mixer
- trucks (semi-trailer and tipper)
- hi-rail (type of truck that is able to travel on railway tracks)
- nail gun
- impact drill
- excavator (with auger)
- line marking truck
- coring machine
- demolition saw
- jack hammer
- grinder
- manitou (forklift)
- scissor lift
- franna crane
- lighting tower
- crane truck
- compactor roller
- vacuum truck
- small excavator
- wacker packer
- generator
- bobcat
- hand tools
- skip truck
- elevated work platforms
- drill rig.

3.4.3 Working hours

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

- 7am to 6pm Monday to Friday
- 8am to 1pm Saturdays
- no work on Sundays or public holidays.

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

Out of hours work may be 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 around six rail shutdowns would be required to facilitate the following:

- installation of piles (using piling rig) for the lifts, underpass and new platform stairs
- excavation and installation of the new platform stairs, lift and the underpass
- lifting and installation of new platform canopy and the lift shaft
- establishment of a temporary concrete ramp in the commuter car park
- establishment of a temporary access ramp and a temporary underline crossing at the northern end of the platform
- installation of two new underground to overhead poles to facilitate the power upgrade
- modification of electrical cables and CSR works
- power upgrade switchover
- platform resurfacing work.

Out of hours work may also be scheduled outside rail shutdown periods. Approval from Transport would be required for any out of hours work and the affected community would be notified as outlined in Transport's *Construction Noise and Vibration Strategy* (TfNSW, 2019a) (refer to Section 3.4.3 for further details).

3.4.4 Earthworks

Excavations and earthworks would generally be required for the following:

- construction of the new pedestrian underpass, which would require bulk excavation underneath the station and railway track
- construction of the new platform stairs, which would require excavation of the existing station platform
- construction of the lift shafts for the two new lifts and entrance stairs from the commuter car park
- excavation to install two new CSRs under the northern end of the platform
- the foundations and pits for the new lift shafts and lifts, which would require excavation at each proposed lift location
- the construction of upgraded footpaths (e.g. pavement resurfacing) and station entrances
- other minor civil work including platform regrading, footings and foundations and drainage/stormwater work.

The Proposal would require the excavation of about 2,840 tonnes of material. Excavated material would be loaded on the platform and lifted to the construction compound by a telehandler where it would be stored for reuse onsite where possible or removed in accordance with relevant legislative requirements. The surplus excavated materials are expected to be recyclable and non-recyclable general solid waste or virgin excavated natural material. Surplus excavated materials would be recycled at licensed facilities. Where re-use is not appropriate, surplus materials would be disposed of offsite at licensed facilities.

The detailed design would confirm the volume of materials excavated to accommodate the underpass, lift pits and foundations, and other ancillary work.

3.4.5 Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal and would consider the requirements of the ISC Infrastructure Sustainability Rating Scheme (v1.2). Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable. Circular economy principles would inform the design and construction.

3.4.6 Traffic access, parking and vehicle movements

Traffic, parking and transport impacts associated with the Proposal are assessed in Section 6.1 of this REF. An indicative construction methodology has been developed for the Proposal (refer to Section 3.4.1). A detailed construction methodology and associated management plans (such as a Construction Environmental Management Plan (CEMP) would be developed during the next design phase of the Proposal to manage potential traffic and access impacts.

For work undertaken during a rail shutdown period, up to 45 heavy vehicles and 40 light vehicles per shift would be expected to travel to and from the Proposal area, while during a normal week day up to 25 heavy vehicles and 30 light vehicles would be expected. It is anticipated that this level of traffic would not have a significant impact on existing traffic

conditions. Traffic control (e.g. signage) would be in place around work areas to inform the public.

The commuter car park would need to be accessed to transport spoil offsite. In addition, during possessions large areas of the car park would need to be accessed by construction workers utilising equipment. It is likely that there would be some disruption to use of the commuter car park during construction for the new underpass, new lifts and unloading of construction materials to the platform, however works would be scheduled to reduce inconvenience to commuters.

Construction vehicles would also need to access the Alexandria Parade new station entrance work area which would require lane closures and traffic control measures at times. Additionally, construction vehicle movements would occur between the laydown area to the north of the station located at Hornsby Street and the compound adjacent to the commuter car park to transport plant and spoil. Some of these movements would occur within the rail corridor during possessions. The community would be informed prior to any changes to access to the commuter car park or parking arrangements on Alexandria Parade. Haulage routes for the Proposal are shown in Figure 3-4.

3.4.7 Ancillary facilities

A temporary construction compound would be required to accommodate site offices, amenities, and a storage area for materials. A construction support site would also be required to facilitate construction of the new pedestrian underpass. Other construction ancillary sites would also be required for materials storage, laydown and construction areas for the new pedestrian underpass. The construction compound location and ancillary sites are shown in Figure 3-2.

Other areas may also be identified as suitable locations and would be subject to further assessment and approval following detailed design of the Proposal. The area nominated for the compound is on land owned by TAHE. Impacts associated with using this area have been considered in Chapter 6 of this REF.

3.4.8 Public utility adjustments

The Proposal would require electrical and power supply upgrades including a new substation and padmount, a new IMSB room, two new underground to overhead poles, and two new CSRs.

The Proposal would also require adjustments to other utilities and services including relocation of stormwater services and new drainage infrastructure. Other services that may need to be relocated include platform lighting and public address services, and the relocation of signalling services required for the new station entrance on Alexandria Parade. The proposed relocation of existing power services would require some scheduled power outages during rail shutdowns.

Further investigation may be required during detailed design to establish the extent of the adjustments. Service relocation and adjustment would be undertaken as required by the construction contractor’s activities. This would be confirmed during detailed design and would be planned and undertaken with the relevant service provider.

Figure 3-3 Key features of the Proposal

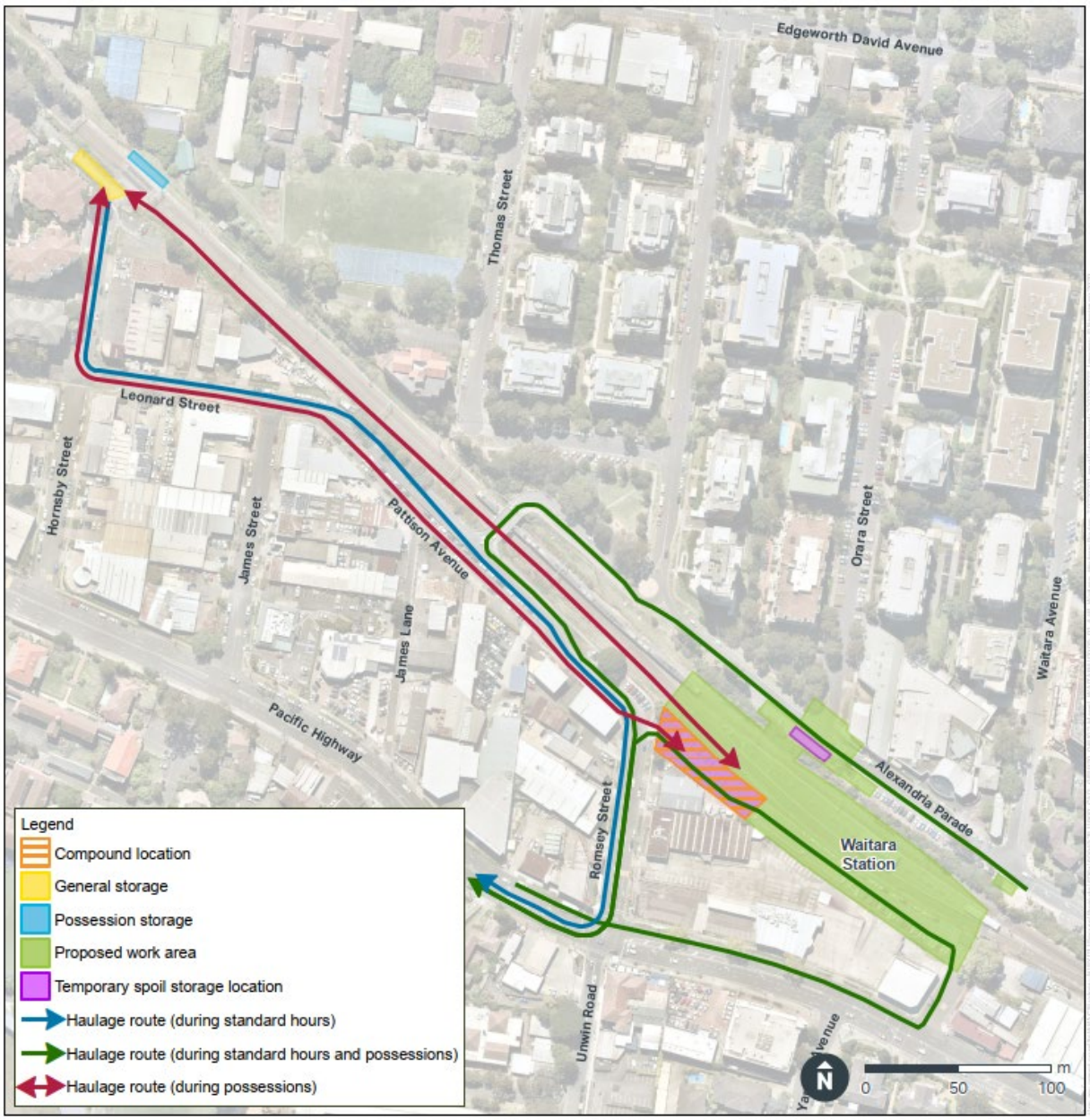


Figure 3-4 Haulage routes for the Proposal

3.5 Property acquisition

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

3.6 Operation and maintenance

The future operation and maintenance of Waitara Station would be subject to further discussions between Transport, Sydney Trains and Hornsby Shire Council. Structures constructed under this Proposal would be maintained by Sydney Trains.

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.

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

4.1.2 Other Commonwealth legislation

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

Table 4-1 Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	There is an obligation on a person who discovers anything which he or she has reasonable grounds to suspect are Aboriginal remains to report that discovery to the Minister, giving particulars of the remains and their location. The Proposal does not include any previously identified Aboriginal sites and/or places (refer Section 6.5); however, considerations for unexpected finds further detailed in mitigation measures and applies to this Act.
Disability Discrimination Act 1992 (DDA)	This Act aims to eliminate as far as possible, discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land. The Proposal would be designed having regard to the requirements of this Act. The key objective of the Proposal is to improve the accessibility of Waitara Station which is consistent with the objectives of this Act.
Native Title Act 1983	This Act aims to provide for the recognition and protection of Native Title, how Native Title land is used and establishes a mechanism for determining claims to Native Title. There are no pending or approved Native Title claims over the Proposal land.

4.2 NSW legislation and regulations

4.2.1 Transport Administration Act 1988

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

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

2A Objects of Act

…

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

b) to promote the integration of the transport system,

c) to enable effective planning and delivery of transport infrastructure and services,

d) to facilitate the mobilisation and prioritisation of key resources across the transport sector,

e) to co-ordinate the activities of those engaged in the delivery of transport services,

f) to maintain independent regulatory arrangements for securing the safety of transport services.

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

…

(a) ***Environmental sustainability***

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

(b) ***Social benefits***

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

4.2.2 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the system of environmental planning and assessment in NSW. This Proposal is subject to the environmental impact assessment and planning approval requirements of Division 5.1 of the EP&A Act. Division 5.1 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as Transport, which do not require development consent under Part 4 of the Act.

In accordance with Section 5.5 of the EP&A Act, Transport, 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.

Section 171 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has or is likely to have a significant impact on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with section 171 and Appendix B specifically responds to the factors for consideration under section 171.

4.2.3 Other NSW legislation and regulations

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

Table 4-2 Other legislation applicable to the Proposal

Applicable legislation	Considerations
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 (NSW)	Clause 22 requires any person who deals with a biosecurity matter has a duty to ensure that in so far as is reasonably practicable, the potential biosecurity risk is prevented, eliminated or minimised. Appropriate management methods would be implemented during construction if declared noxious weeds in the Hornsby Shire LGA are identified (refer to Section 6.7).
Contaminated Land Management Act 1997 (CLM Act) (NSW)	Section 60 of the CLM Act imposes a duty on landowners to notify the Department of Planning and Environment (DPE), 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 work on any Crown land.
Disability Discrimination Act 1992 (DDA Act) (Cwlth)	The Proposal would be designed having regard to the requirements of this Act.
Heritage Act 1977 (Heritage Act) (NSW)	The following sections of the Heritage Act contain requirements for impacts to heritage listed items or exposure of relics: • 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. The Proposal would involve work within the locally listed Waitara Railway Station (which is listed under the TAHE Section 170 Heritage and Conservation Register). The Proposal would have a moderate to minor impact to the station. The key elements that contribute to the station's historical significance (station building and subway) would remain largely intact (refer Section 6.5).
National Parks and Wildlife Act 1974 (NPW Act) (NSW)	Sections 86, 87 and 90 of the NPW Act require consent from NSW Department of Planning and Environment (DPE) for the destruction or damage of Indigenous objects. The Proposal would be unlikely to disturb any Indigenous objects (refer to Section 6.4). However, if unexpected archaeological items or items of Indigenous heritage significance are discovered during the construction of the Proposal, all work would cease and appropriate advice 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) would not be required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, Transport would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Contractor.
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 work on unclassified roads. The Proposal would not require work on any surrounding roads, therefore consent under the Roads Act would not be required.
Sydney Water Act 1994 (NSW)	The Proposal would not involve discharge of wastewater to the sewer.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW)	Transport would carry out the Proposal having 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 work, drainage or flood work, controlled activities or aquifer interference.

4.2.4 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

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

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

> *'Development for the purpose of a railway or rail infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land.'*

Clause 78 defines 'rail infrastructure facilities' as including elements such as:

> *'railway tracks, associated track structures, cuttings, drainage systems, fences, tunnels, ventilation shafts, emergency accessways, bridges, embankments, level crossings and roads, pedestrian and cycleway facilities.' (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.

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

State Environmental Planning Policy 55 – Remediation of Land

State Environmental Planning Policy No.55 — Remediation of Land (SEPP 55) provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. While consent for the Proposal is not required, the provisions of SEPP 55 have still been considered in the preparation of this REF.

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

4.2.5 Hornsby Local Environmental Plan 2013

The Proposal is located within the Hornsby Shire LGA. The Infrastructure SEPP prevails over all other environmental planning instruments (such as Local Environmental Plans (LEPs)) except where there is an inconsistency with the State Significant Precincts or Coastal Management SEPPs. During the preparation of this REF, the provisions of the *Hornsby Local Environmental Plan 2013* (Hornsby LEP) were considered (refer Table 4-3).

Under the Hornsby LEP, the rail infrastructure is zoned SP2 Infrastructure (classified railway). To the west of the station the land is primary zoned B6 Enterprise Corridor and contains various car dealerships and light industrial premises. The area to the east of the station is primarily zoned as R4 High Density Residential land, apart from land zoned B2 Local Centre located opposite from the station building.

The land use zoning of the station and surrounding areas under the Hornsby LEP is shown in Figure 4-1.

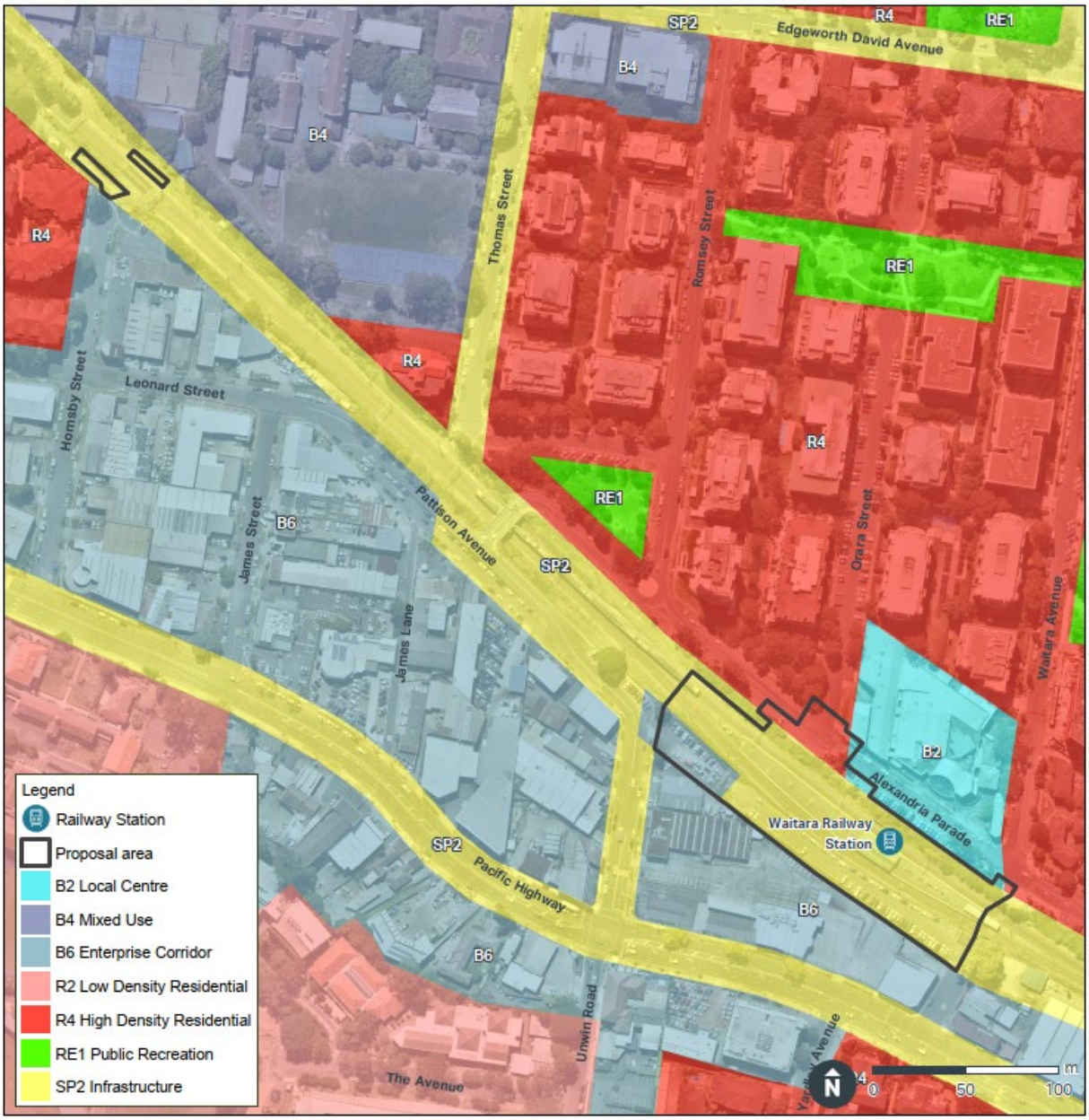


Figure 4-1 Land use zoning surrounding the Proposal

Table 4-3 Relevant provisions of the Hornby LEP

Provision description	Relevance to the Proposal
Clause 2.3 – Zone objectives and Land Use Table	Under the Hornsby LEP: • the rail corridor and commuter car park is zoned SP2 – Infrastructure (Railway) • area to the west is zoned as B6 – Enterprise Corridor • area to the east is zoned as B2 – Local Centre • immediate surrounding residential areas are zoned R4 – High Density Residential. The Proposal (including the location of temporary construction facilities) would be located within the rail corridor (land zoned SP2 and B6). The Proposal is consistent with the objectives of the SP2 infrastructure zoning as it would provide for infrastructure uses associated with the railway and would ensure that the scale and character of the development is compatible with the landscape setting and built form of surrounding development. Proposed work on land zone B6 would be for construction purposes only and therefore temporary.
Clause 7.2 – Natural resources sensitivity – biodiversity	Clause 6.4 of the Hornsby LEP is aimed at maintaining terrestrial biodiversity, including protecting native fauna and flora and ecological processes. By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the clearing of vegetation for the Proposal is permissible without development consent. A discussion of potential impacts to vegetation is discussed in Section 6.7.
Clause 5.10 – Heritage conservation	Clause 5.10 of the Hornsby LEP aims to conserve the environmental heritage within the LGA. There are several listed heritage items within proximity of the Proposal, including a conservation area, street trees along Alexandria Parade, and a shop. A Statement of Heritage Impact has been prepared as part of this REF which considers the impact the Proposal would have on these heritage items and concludes there would be no adverse impacts. Potential impacts to Aboriginal and non-Aboriginal heritage are assessed in Section 6.4 and 6.5.
Clause 5.12 – Infrastructure development and use of existing buildings of the Crown	Clause 5.12 of the Hornsby LEP does not restrict or prohibit the carrying out of any development, by or on behalf of a public authority, which is permitted to be carried out with or without development consent. The Proposal would be undertaken by a public authority and is permitted without development consent.
Clause 6.1 – Acid Sulfate Soils	The Proposal is located within an area of probability of occurrence of acid sulfate soils (ASS). Consideration of the potential effects of ASS is provided within Section 6.8 of this REF.

Provision description	Relevance to the Proposal
Clause 6.2 – Earthwork	Clause 6.2 of the Hornsby LEP aims to ensure that earthworks for which development consent is required would 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; however, consideration of the potential impacts and mitigation measures for earthworks associated with the Proposal are outlined in Section 7.2.

4.3 Ecologically sustainable development

Transport 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 section 193 of the EP&A Regulation as:

- the precautionary principle – if there are threats of serious or irreversible environmental damage, lack of full scientific certainty 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 conservation of biological diversity and ecological integrity should be a fundamental consideration.
- improved valuation, pricing and incentive mechanisms – environmental factors should be included in the valuation of assets and services.

The principles of ESD have been adopted by Transport throughout the development and assessment of the Waitara Station Upgrade. Section 6.12 includes an assessment of the Proposal on climate change and sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5 Community and stakeholder consultation

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

5.1 Stakeholder consultation during the concept design

Key stakeholders including Hornsby Shire Council, Sydney Trains and Transport, were engaged during development of the concept design plan to provide insights into the scope of work for the Proposal, and to participate in the development and assessment of the station upgrade options.

Early engagement was undertaken between 23 September and 7 October 2020 to provide the community an opportunity to have their say on the concept design for Option 2 (see Section 2.5). Transport advertised this engagement period via:

- advertisements in the North Shore Times
- notifications distributed to a 500 metre radius of Waitara Station
- notifications handed out at the station during morning and afternoon peaks
- geo-targeted social media posts
- signage installed at the station, a dedicated project web page and social media updates with information on the project, with a web feedback form to collect feedback from the community.

The project received 24 submissions during this have your say period. Community sentiment was supportive of the proposed concept design, however potential heritage impacts were raised as a concern, as well as consideration of a new station entrance. The feedback received from the community was provided to Transport for consideration and to help inform the planning process and documentation.

Key themes which emerged during early engagement included:

- support for the Proposal
- requests to preserve the heritage character of the station
- requests for additional lighting and CCTV to increase customer safety
- requests for additional canopies and shelter at the station
- suggestions to improve pedestrian movement around the station.

In response to this feedback and as a result of ongoing design development to manage potential heritage impacts, a new concept design was developed in 2021 and has been assessed in this REF (Option 4).

Due to the extent of changes to the Proposal as a result of the new concept design (Option 4) that included a new accessible station entry point at the northern end of the station, Transport undertook another round of engagement on the new concept design in late 2021. Feedback on the new concept design was invited from 8 November until 22 November 2021. Transport advertised this engagement period via:

- advertisement in the North Shore Times
- notifications distributed to a 500 metre radius of Waitara Station

- geo-targeted social media posts
- signage and poster installed at the station, with notifications made available to customers
- a dedicated project web page and social media updates with information on the project, with a web feedback form to collect feedback from the community
- email blast to stakeholders.

The project received 66 submissions during this have your say period. Key themes which emerged were:

- support for the new concept design
- requests for the new lifts or one lift to be installed in the existing southern entrance
- suggestions to improve pedestrian movement around the station
- support to retain the existing underpass/entrance
- suggestions on traffic impact/changes
- requests for an accessible pathway to the lifts from the commuter car park
- requests for additional canopies and shelter at the station.

5.1.1 Community consultation during COVID19

In response to the evolving COVID19 situation, Transport follows NSW Health advice and adapts the way it engages with the community on important transport infrastructure projects.

We provide multiple communication channels for stakeholders and the community to learn more about the project, provide important feedback and raise concerns, ask questions, meet with members of the project team, and be kept up to date on progress, safely and effectively.

This includes information on our website, social media and online meetings/discussions where appropriate, emails and phone calls and face to face interactions, which comply with Public Health Orders and Transport policies.

Transport will continue to deliver projects across NSW, while ensuring the safety of all staff and the community.

5.2 Consultation requirements under the Infrastructure SEPP

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

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

Table 5-1 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 | Consultation with Councils – development with impacts on council related infrastructure and services	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 • significantly disrupt pedestrian or vehicle movement • involve significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes work that would: • disrupt pedestrian and vehicle movements • impact on road pavements under Council's care and control • impact on Council-operated footpaths. Consultation with Hornsby Shire Council has been undertaken and would continue throughout the detailed design and construction phases.
Clause 14 | Consultation with Councils – development with impacts on local heritage	Where railway station work: • substantially impact on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area.	The Proposal would have an impact on a local heritage item listed on the s.170 Register (Waitara Railway Station Group). Waitara Railway Station is not listed within the Hornsby LEP as a local heritage item and therefore consultation with Hornsby Shire Council under this clause is not required. However, consultation with Sydney Trains Heritage Team has been undertaken and would continue throughout the detailed design and construction phases.
Clause 15 | Consultation with Councils – development with impacts on flood liable land	Where railway station work: • 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 not located on land that is susceptible to flooding. Accordingly, consultation with Council is not required in regard to this aspect.
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	Where railway station work: • impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land	Waitara Station is not located on land that is within a coastal vulnerability area and therefore this clause does not apply. Accordingly, consultation with Council is not required in regard to this aspect.

Clause	Clause particulars	Relevance to the Proposal
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	Where railway station work: • impact on flood liable land -written notice must be given (together with a scope of work) to the State Emergency Services and take into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given.	Waitara Station is not located on land that is on flood liable land and therefore this clause does not apply and consultation with the State Emergency Service is not required.
Clause 16 | Consultation with public authorities other than Councils	For *specified development* which includes consultation with DPE for development that is undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974*, and other agencies specified by the Infrastructure SEPP where relevant. Although not a specific Infrastructure SEPP requirement, other agencies Transport may consult with could include: • Sydney Trains • NSW Train Link • EES.	The Proposal is not located adjacent to land reserved under the *National Parks and Wildlife Act 1974*. Accordingly, consultation with the DPE on this matter is not required. The Proposal is not considered to be specified development under Clause 16 of the Infrastructure SEPP. Consultation with Sydney Trains has occurred throughout the optioneering and concept design process and would continue during detailed design of the Proposal.

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 project team. The consultation strategy developed ensures stakeholders, customers and the community are informed and have the opportunity to provide important input on the Proposal.

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 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:

- distribution of a project newsletter to local community and rail customers, outlining the Proposal and inviting feedback on the REF
- advertisement of the REF public display in local newspaper (North Shore Times) with a link to the Transport website that includes a summary of the Proposal, links to the REF and supporting document and information on how to provide feedback
- a geo-targeted social media campaign during the public display period (Facebook)
- consultation with Council, Sydney Trains, NSW Trains and other non-community stakeholders
- a community information session on Wednesday 30 March between 4-6pm at Waitara Station
- stakeholder emails to members of the community who have registered to the project contact list
- online feedback form on the project website
- posters at the station advising customers where to view the REF and how to make a submission.

Community consultation activities for the Proposal would be undertaken during the public display of this REF. The display period of the REF would be advertised the day the public display commences. The REF would be displayed for a period of two weeks. The REF would be placed on public display on the Transport website: www.transport.nsw.gov.au/waitara

Further information on the Proposal may be requested by contacting the Project Infoline on 1800 684 490 or by email at projects@transport.nsw.gov.au.

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

- email: projects@transport.nsw.gov.au
- Feedback form via the Transport website: www.transport.nsw.gov.au/waitara
- writing to:
  Transport Access Program – Waitara Station Upgrade
  Associate Director, Planning
  Transport PO Box K659, Haymarket NSW 1240

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

5.5 Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal (the area around Waitara Station) plus a 50 metre radius, on 18 February 2022. The search result indicated no Aboriginal sites or items within the search area.

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

5.6 Ongoing consultation

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

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

Should Transport determine to proceed with the Proposal, the project team would keep the community, councils 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 section 171 of the EP&A Regulation. A checklist of section 171 factors and how they have been specifically addressed in this REF is included at Appendix B.

6.1 Traffic and transport

6.1.1 Existing environment

Waitara Station

Waitara Station is served by the T1 North Shore and Western Line and T9 Northern Line with services to Sydney CBD, Hornsby, Berowra, North Sydney, Parramatta and Blacktown. The adjacent stations to Waitara Station are Wahroonga Station (to the south) and Hornsby Station (to the north). Wahroonga Station is currently undergoing a Transport Access Program station upgrade. Construction commenced late 2020 and is due to be completed in 2022.

The station is located between Alexandria Parade and Waitara Avenue and is accessed by an underpass between these two roads. The station has one island platform (Platform 1 and 2). Platform 1 provides train services to the city and Platform 2 provides services to Berowra.

Both platforms have services every eight minutes during peak periods (7:30am to 8:30am and 6pm to 7pm) and every 15 minutes outside the peak period. Based on Opal data provided by Transport in 2014, Waitara Station recorded 1,035 trips during the AM peak hour demand on an average day.

Stairs down to the underpass and up to the platform provide the only means of access to the platform. Accessibility to the station is currently limited for people with mobility issues, as stairs provide the only means of access to the platform and to the southern entry to the station on the opposing side of the station. The underpass also provides a means for pedestrians and cyclists to cross the railway corridor.

The majority of the station facilities (e.g. toilets, payphone, etc.) are located on the platform. A number of interchange facilities include the commuter car park, accessible car spaces, and kerbside kiss and ride bays.

The modes used to access Waitara Station are summarised in Figure 6-1. The largest access mode for the station is walking (66%) while the other three access modes are equally distributed at around 12% each.

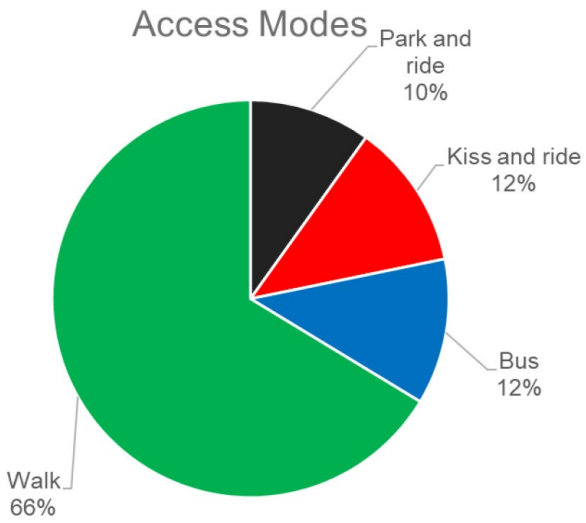


Figure 6-1 Modes of access to Waitara Station by customers (Source: Stantec, 2019)

Pedestrian facilities

Footpaths are present along the eastern side of Alexandria Parade, and both sides of Waitara Avenue. From Waitara Avenue and Alexandria Parade, it is a 50 metre and 40 metre walk respectively to the platform. There is no formal pedestrian footpath between the parallel parking on the western side of Alexandria Parade and the station.

A signalised pedestrian crossing is located on Alexandria Parade, opposite Waitara Avenue, which enables pedestrians to cross Alexandria Parade to enter the underpass.

The underpass provides a permeable street network, allowing pedestrians to cross the rail corridor between Pacific Highway and Alexandria Parade.

Bicycle network and facilities

There is currently limited bicycle connectivity to Waitara Station although Alexandria Parade adjacent to the station is categorised as a 'moderately difficult' route on the Hornsby Shire Council cycling map (Hornsby Shire Council, 2008).

The Hornsby Shire Council's *Draft Walking and Cycling Strategy* (2020a) is based off the major movement corridors provided in the North District Plan (Greater Sydney Commission, 2018a). The draft strategy identifies various potential bike routes in the area, including:

- along parts of Edgeworth David Avenue from Hornsby town centre through the suburb of Waitara
- along Waitara Avenue and along Park Lane (east bound) until Woonona Avenue and then joining up with Edgeworth David Avenue
- along Waitara Avenue, across the Pacific highway, and west on Yardley Avenue
- roads surrounding schools including Clarke Road, Malsbury Road and Urwin Road
- along Alexandria Parade nearby its intersection with the Pacific Highway towards Ku-ring-Gai Council.

Acknowledging multiple barriers to cycling within the Hornsby Shire LGA, the draft strategy objectives include identifying future cycling routes with appropriate gradients, appropriate road or pavement space, and appropriate tree canopy cover. While provision of bicycle facilities on the surrounding street network is minimal, this is projected to be improved with the implementation of the draft strategy once finalised.

At Waitara Station there are four secure bike lockers located at the turning circle at the western end of the commuter car park. The underpass provides cyclists with a way to cross the rail line, however cyclists have to dismount to use the stairs.

Public transport

The nearest bus stop which services Waitara Station is located on the Pacific Highway, 60 metres west of the station. The stop provides services west to The San Hospital, Parramatta, Cherrybrook and Castle Hill (bus routes 600, 589 and N90 NightRide). Northbound these same bus services on the Pacific Highway all terminate at Hornsby.

The area is also serviced by the 587 Hornsby to Westleigh (Loop Service), the 588 Hornsby to Normanhurst West (Loop Service), which pass many schools located to the west of the Pacific Highway.

On the eastern side of Waitara Station, the nearest bus stop is located on Edgeworth David Avenue opposite Willow Park. Services that run from this location include the 575 Hornsby to Macquarie University via Turramurra, and the 591 Hornsby to St Ives.

There are also multiple schools located in the area that run private bus services for students. These are likely to operate before school and after school hours. In addition, the nearby Magpies Rugby Leagues Club on Alexandria Parade run a courtesy bus in the afternoon and evenings from Thursday to Sunday.

There are also likely to be other community bus services such as those offered for residents of the retirement villages located nearby.

Road network

The key existing roads in the vicinity of the Proposal include Alexandria Parade, Waitara Avenue and Pacific Highway as shown in Figure 1-2.

Alexandria Parade is a two-way, two lane local road which provides parking on each side. The road links to Pattison Avenue/ Romsey Street to the north and Millewa Avenue to the south. The road primarily provides access to the station and residential and commercial properties to the east of the station. The road is designated as a shared zone where the speed limit of 40km/h applies in the vicinity of the station.

Waitara Avenue is an east-west road which is transected by the rail line. On the western side, the road connects the commuter car park with the Pacific Highway. It is a two-lane local road, with a parking lane on each side. The road primarily provides access to the station, commercial properties and a restaurant to the west of the station. Waitara Avenue has a posted speed limit of 50km/h and 40km/h during the school zone times

Parking

Car parking facilities are currently provided on both sides of Waitara Station. A dedicated off-street commuter car park is located off Waitara Avenue which provides unrestricted parking for station customers. Two accessible parking spaces are located within this car park. There are six restricted on-street car parking spaces on Waitara Avenue.

At-grade parking along Alexandria Parade provides unrestricted car parking for station customers. Two accessible parking spaces are also currently provided in this location near the station entrance. Unrestricted parking is available on Park Avenue, to the south of the station entrance. A mixture of 1P timed parking and unrestricted parking is also available on the eastern side of Alexandria Parade. On Orara Street, there is a mixture of 2P and 4P timed parking and unrestricted parking further away from Alexandria Parade nearby Waitara Park Playground.

An existing informal kiss and ride bay is located on Alexandria Parade, opposite the station entrance. Waitara Avenue and the commuter car park are both likely to be used as informal kiss and ride bays on the western side of the station.

Taxi activity for the station is likely to be limited, however, taxis would occasionally use the informal kiss and ride bay on Alexandria Parade to pick-up and drop-off passengers.

6.1.2 Potential impacts

Construction phase

Pedestrians

During construction, pedestrian access to the station would be maintained via the existing access arrangements, including cross-corridor access across the station. Temporary pedestrian diversions or disruptions around the construction work areas including along Alexandria Parade would have the potential to increase risk to pedestrian safety, due to potential interactions with construction plant and vehicles.

Construction vehicles would mainly access the site from the Pacific Highway and Waitara Avenue, however some construction vehicles may also use Alexandria Parade. Appropriate signs and/or traffic controllers would be positioned to notify pedestrians of any temporary access arrangements. Potential interaction between construction plant or vehicles and pedestrians would be managed and controlled by traffic controllers.

The presence of construction work on the platform would reduce the amount of space available on the platform and temporarily impact pedestrian movements, however the majority of work would be contained to the northern end of the platform, away from the existing station entrance area. Construction work would be staged and certain activities (such as lift installation and modifications to existing stairs) would be scheduled during the railway shutdowns to minimise these impacts. Appropriate signage would be provided to mitigate any potential impacts to pedestrian movement on the platform.

Mitigation measures would be subject to further consideration during detailed design and construction planning in consultation with the relevant authorities. A CEMP would be in place for the Proposal, including a Construction Traffic Management Plan (CTMP) which would include management of potential impacts to pedestrians. Wherever possible, the community would be notified in advance of any planned work which would impact pedestrian movements.

Cyclists

The secure bike storage facility located within the commuter car park would be permanently removed during the construction of the Proposal. To reduce the impact on cyclists, the construction works would be sequenced in a way that prioritises the early installation of bike hoops at the southern end of the station. Therefore, construction work would have a minor impact on the use of the facility, and it is not expected that cyclists would be significantly affected.

Public transport

No impacts to public transport are anticipated during construction of the Proposal.

Road network

Haulage routes for construction vehicles accessing the construction compound and laydown area and removing spoil would include the Pacific Highway, Hornsby Street, Romsey Street, Pattison Avenue, Leonard Street, Waitara Avenue and Alexandria Parade (as shown in Figure 3-4). Traffic generated by construction vehicles, including staff vehicles, is likely to be intermittent given the nature of the work proposed.

For work undertaken during a rail shutdown period, up to 45 heavy vehicles and 40 light vehicles per shift are expected to travel to and from the Proposal area, while during a normal weekday up to 25 heavy vehicles and 30 light vehicles are expected. It is anticipated this level of traffic would not have a significant impact on existing traffic conditions. Traffic control (e.g. signage) would be in place around work areas to inform the public.

During construction, there may be interruptions to traffic flow along Alexandria Parade, including temporary lane closures for construction of the pedestrian underpass, the new northern station entrance and installation of the new pedestrian crossing. Localised traffic control during construction would be essential to maintaining functionality of the road network particularly Alexandria Parade.

Consultation with Hornsby Shire Council would be undertaken with regard to potential disruptions to Alexandria Parade. It is unlikely a road occupancy licence would be required as no impacts to the Pacific Highway (which is a classified road) are proposed. Road work would be undertaken progressively and in the minimum area and timeframe required to undertake the particular phase of work.

Access for emergency vehicles would be maintained at the station in accordance with emergency vehicle requirements. Emergency services would be advised of all planned changes to traffic arrangements prior to applying the changes. The existing kiss and ride bay on Alexandria Parade would remain in operation during construction of the Proposal.

Other construction traffic impacts may also include a minor increase in traffic on the local road network due to the increase in construction vehicle movements.

Parking

Parts of the commuter car park and at-grade parking on Alexandria Parade would remain available for commuter use during the construction of the Proposal.

A temporary construction support site would be located in the commuter car park which would result in a temporary loss of up to around 25 car parking spaces at the north end of the commuter car park for construction work, including the excavation of the new underpass, construction of the lift, loading and unloading construction materials to the platform and removal of spoil. During possessions, the whole commuter car park would be closed to the public and utilised by construction equipment. This impact would be temporary and is not expected to be significant as commuters are unlikely to be using the commuter car park during possessions, which would be over the weekend. The surrounding parking network on local streets east of the station would be sufficient to absorb the increased demand in parking. Prior notice would be provided to commuters if a temporary loss to existing car parking is required during construction.

Up to around 20 car parking spaces would be temporarily unavailable during construction on Alexandria Parade to facilitate a safe work area for the new station entrance. Potential impacts to traffic movements along Alexandria Parade would be managed through traffic control measures in consultation with the relevant authority.

This impact would reduce parking availability around the station and increase demand on surrounding roads. The existing non-compliant accessible parking spaces would be maintained during construction where possible, however there is potential for these to be temporarily unavailable during the construction work to reconfigure these spaces to ensure DDA compliance.

Parking provisions are not proposed for construction staff vehicles within or adjacent to the construction site. Construction workers would be required to park around the Proposal area (avoiding the commuter car parks) and be encouraged to car-pool or use public transport services. However, it is expected that workers would travel via private vehicles which may marginally increase the demand for parking surrounding the station during the construction period. The CTMP would be prepared to manage the impacts of construction traffic parking by

reducing the size of the construction area within the commuter car park whenever possible and identifying options for offset parking to account for the loss of commuter car parking spaces during construction. Construction workers would also be encouraged to park away from the station and residential areas where possible. Prior notice would be provided to customers if a temporary loss to existing car parking is required during construction.

Property access

It is expected that surrounding property access would be maintained during construction.

Prior to construction, the construction Contractor would obtain any licences / approvals required for operating a crane within private airspace where required. Proposed work within private airspace (if required) would be undertaken in accordance with the requirement of any relevant licences / approvals and in consultation with affected property owners and the contactor would adhere to all relevant requirements to ensure the safe operation of the crane.

Operational phase

Pedestrians

The Proposal would include the provision of a new pedestrian footpath from the station to the proposed pedestrian crossing on Alexandria Parade, improving pedestrian access on the eastern side of the station. Existing station access and egress arrangements for pedestrians would remain unchanged.

The installation of two new lifts would enable access to the station platform from the new pedestrian underpass at the northern end of the platform. New kerb ramps would provide access from the relocated accessible parking spaces in the commuter car park directly to the new lift which would increase accessibility to and from the station. Customer connectivity would be improved by the provision of two new parallel kiss and ride bays in the commuter car park.

The Proposal would improve the user experience in the vicinity of the station with the potential to encourage more customers to walk to the station.

Cyclists

The bike lockers facility located within the commuter car park would be replaced with four new bike hoops on Alexandria Parade at the existing station entrance. The provision of new bike hoops in a more accessible location would encourage bike storage at the station and potentially encourage more customers to cycle to the station.

Public transport

The Proposal does not include changes to bus or rail services and would not impact on the operation (service operation or timetabling) of public transport in the vicinity of Waitara Station. The Proposal includes improved facilities and access to Waitara Station, which may increase rail patronage.

Road network

The Proposal would assist in making public transport infrastructure more accessible to rail customers and in providing an improved transition between transport modes, which would likely increase patronage. It is anticipated that the improved commuter experience and upgraded facilities are likely to result in a marginal increase in traffic (from people accessing the station by car), with a negligible impact on the surrounding road network.

Parking

The Proposal includes the provision of two new accessible parking spaces on Alexandria Parade and two new kiss and ride bays within the commuter car park. No formal taxi zone has been proposed as part of the Proposal.

The Proposal improves the accessibility at Waitara Station by relocating the accessible parking spaces in the commuter car park closer to the northern station entrance which would provide a DDA compliant path of travel from the commuter car park to the station platform.

In total, the following car parking spaces would be removed to facilitate the northern station entrance, new accessible parking, kiss and ride bays and pedestrian underpass:

- up to 20 car parking spaces from Alexandria Parade
- up to 14 car parking spaces from the commuter car park.

These numbers represent worst case requirements and it is expected that during detailed design, refinements of the construction methodology would further reduce parking impacts with the objective of minimising loss of public parking.

Overall, given the existing number of car parking spaces available at Waitara Station and that there is unrestricted on-street car parking on both sides of Alexandria Parade, it is not expected that this loss would have a major impact on car parking demand. Opportunities for offset parking arrangements would be further investigated regarding the use of existing car parks in the vicinity of the station and nearby stations, and communication would be provided to the local community regarding this matter.

Property access

No changes to private property access would be required as part of the operation of the Proposal.

6.1.3 Mitigation measures

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

- procedures for preparing and implementing Traffic Control Plans (TCPs) which would provide details for signage and timing of any detours and traffic controls to manage temporary road disruptions such as modifications to the commuter car park on Waitara Avenue and the delivery of large plant and materials
- identification of final construction traffic access routes, ancillary facilities, contractor parking and loading zones
- nomination of access routes to and from the local road network and contractor parking
- scheduling of work / deliveries to avoid peak times and limiting of work in the road carriageway as much as practicable to limit traffic and parking impacts and maintain customer access to the station
- consideration of opportunities to minimise the size of the construction area within the commuter car park whenever possible to minimise parking unavailability during construction
- identification of options for offset parking to account for loss of commuter car parking spaces surrounding Waitara Station
- measures to:
    - maintain pedestrian underpass cross corridor access and customer access to the station through traffic and pedestrian diversions
    - maintain private property access unless otherwise agreed

- identify changed traffic/pedestrian conditions including details of construction signage including signposts and variable message signs, traffic controllers and other community notifications
- sequence construction work to prioritise the early installation of bike hoops at the southern end of the station.

To mitigate operational parking impacts, opportunities for offset parking arrangements would be further investigated regarding the use of existing car parks in the vicinity of the station and nearby stations including the availability of the 321 Transport leased car parking spaces within Hornsby Westfield (L4) (available until 3 July 2022) and the Hornsby commuter car park of 143 car parking spaces on Jersey Street, Hornsby (expected to be available by 25 August 2022). Communication would be provided to the local community regarding the loss of car parking spaces and the available offset parking opportunities in nearby locations.

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

6.2 Urban design, landscape and visual amenity

A Landscape Character and Visual Impact Assessment (LCVIA) was undertaken for the Proposal (AECOM, 2022). The assessment included a desktop review, visual envelope mapping, site visit (7 February 2022), landscape character assessment, visual impact assessment and preparation of photomontages. The photomontages provide an indication of what the Proposal may look like from key viewing areas upon completion and the likely scale of the Proposal's features.

The LCVIA assesses the Proposal at operation and also provides a brief high-level commentary around visual impacts arising from construction. The method distinguishes between the 'impact' (defined as the action being taken), and the 'effect' (defined as the change resulting from that action).

An impact grading matrix for sensitivity and magnitude was used to assess both landscape and visual impacts. Sensitivity relates to the ability of the landscape to accept a change (such as the introduction of lifts) without adverse impact on its character. Magnitude relates to the degree of change affecting a landscape.

The matrix is used to combine the ratings for sensitivity and magnitude to provide an overall 'Significance of Landscape Effects' rating and 'Significance of Visual Effects' rating. Ratings of high and high-moderate are considered to be significant. This matrix is presented in Table 6-1. A qualitative assessment further assigns a rating of Adverse, Neutral or Positive to the change in the views seen by receptors.

Table 6-1 Landscape character and visual impact grading matrix

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High	High to Moderate	Moderate	Negligible
	Moderate	High to Moderate	Moderate	Moderate to Low	Negligible
	Low	Moderate	Moderate to Low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

6.2.1 Existing environment

Landscape character

A study area comprising a 750 metre radius from the Proposal was selected for this assessment. This was considered a conservative radius given the relatively flat topography, the low elevation of the station and the visual screening provided by vegetation within the rail corridor and adjacent built form.

As outlined in Section 1.2, Waitara Station is located around 20 kilometres from the Sydney CBD. The topography within the Proposal area includes two ridgelines: one to the south running in a north-south direction; the other roughly following the Pacific Highway and running from the north to south. Waitara Station is located on the north-south ridgeline, with the landscape falling to the east away from the rail corridor. There are no waterways within the study area. The area surrounding Waitara Station is predominantly high density residential development to the north and light industrial development to the west.

Landscape character zones

A landscape character assessment was undertaken which identified what makes Waitara Station and it's surrounds distinctive, without necessarily assigning a value to it. Distinct parts of the overall landscape have been separately defined and mapped as 'Landscape Character Zones' (LCZ) to provide a framework to describe the Proposal area. The LCZs help assess how the Proposal would affect the elements that make up the landscape, aesthetic and perceptual aspects of the landscape and its distinctive character.

Eight LCZs have been identified within the study area (refer Figure 6-2):

- LCZ 1: Rail Corridor
- LCZ 2: Major Road Corridor
- LCZ 3: Education
- LCZ 4: Town Centre / Retail
- LCZ 5: Recreation
- LCZ 6: High Density Residential
- LCZ 7: Medium to Low Density Residential
- LCZ 8: Mixed Use / Light Industrial.

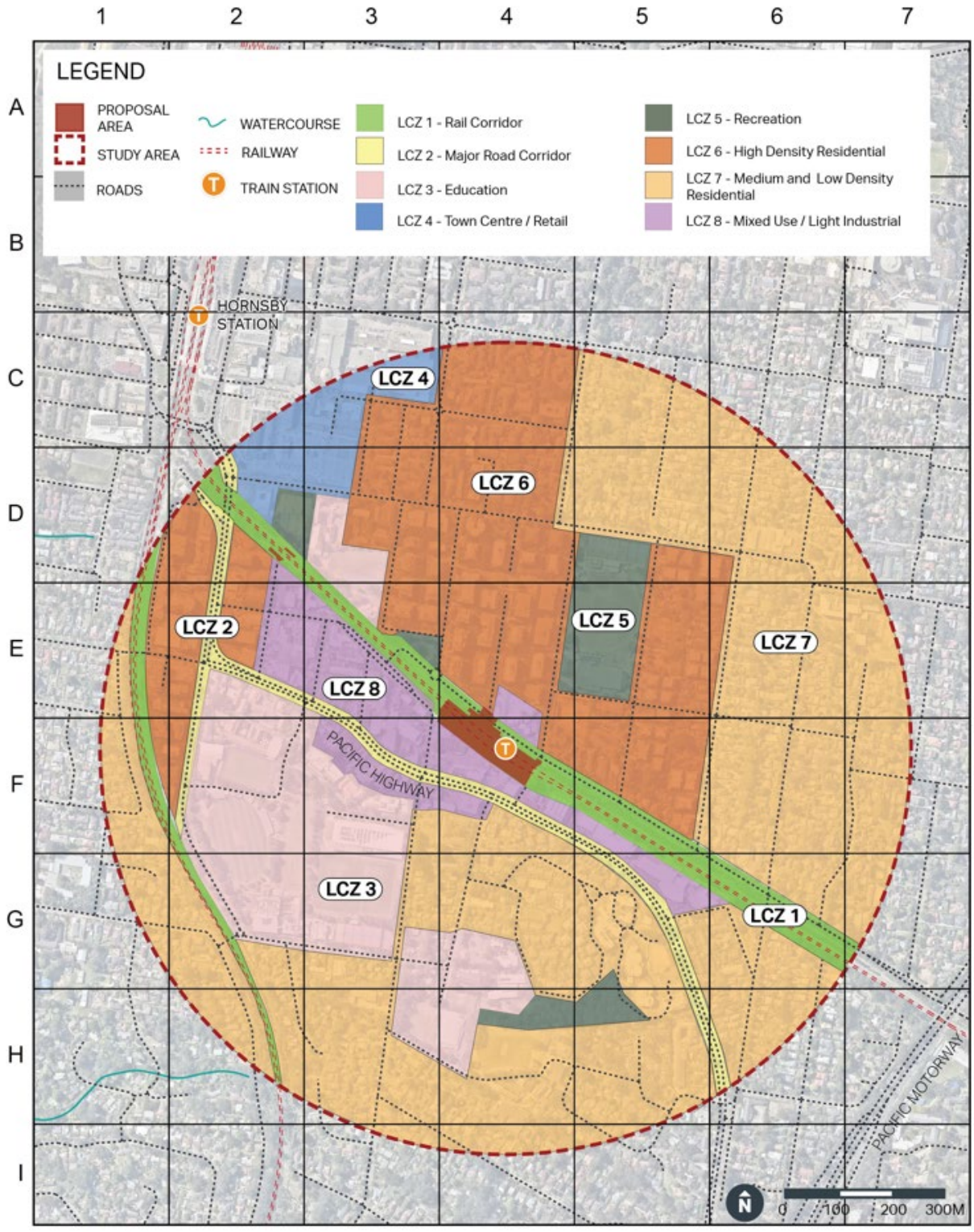


Figure 6-2 Landscape Character Zones

Visual receptors

Visual receptors are individuals and/or groups of people whose views may be affected by the Proposal. Key visual receptors include:

- rail commuters accessing or passing through Waitara Station
- workers or visitors to the nearby business enterprises
- residents in surrounding taller residential apartment buildings near to the station.

Five representative viewpoints have been chosen to represent the change in views from the visual receptors as a result of the Proposal. These are shown in Table 6-2 and Figure 6-3. The rationale for choice of viewpoints is as follows:

Table 6-2 Visual receptor locations

Viewpoint	Location	Description
Viewpoint 1	Magpies Waitara	This viewpoint was selected to assess the changes observed from the public domain and from Magpies Waitara Rugby League Club at 11-37 Alexandria Parade.
Viewpoint 2	Intersection of Orara Street and Alexandria Parade, Waitara	This viewpoint was selected to assess the changes viewed from the intersection at this location, which is near a private park space provided for one of the high-density residential apartments.
Viewpoint 3	Alexandria Parade Overbridge, Waitara	This viewpoint was selected to assess the changes as seen from the road overbridge. This would be the location at which all changes resulting from the Proposal would most likely be seen at one time.
Viewpoint 4	Intersection of Pattinson Avenue and Romsey Street	This viewpoint was selected to assess the changes seen from Romsey Street looking towards the station, which would be the location at which the Proposal would be most visible to passing traffic.
Viewpoint 5	Waitara Station commuter car park, Waitara	This viewpoint was selected to assess the changes seen from the commuter car park as commuters enter the station.

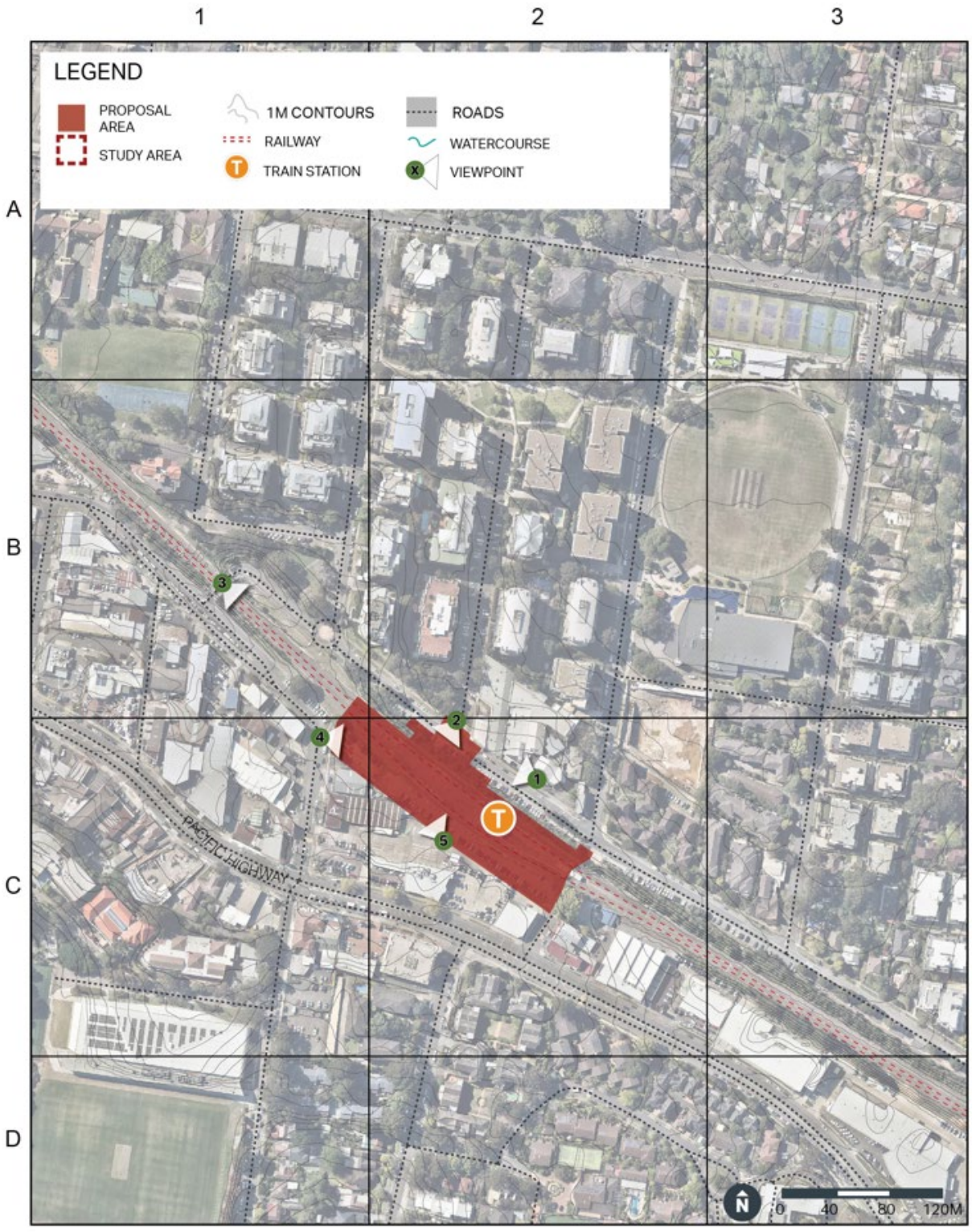


Figure 6-3 Representative viewpoint locations

6.2.2 Potential impacts

Landscape character zones

While eight LCZs have been identified for this assessment, changes due to the Proposal:

- only occur within one LCZ (LCZ 1)
- lie within close proximity of two additional LCZs (LCZs 6 and LCZ 8).

The Proposal would result in no changes to LCZ 2, 3, 4, 5 and 7 due to their distance from the Proposal and / or screening by built form, topography and vegetation, therefore these, while identified, have not been described in detail or assessed.

A summary of potential impacts to the relevant LCZs using the impact grading matrix is shown in Table 6-3.

Table 6-3 Impacts to Landscape Character Zones

Zone	Anticipated change	Sensitivity to change	Magnitude of change	Rating (refer to Table 6-1)
LCZ 1: Rail Corridor	Key changes due to the Proposal include the presence of new infrastructure including the new pedestrian underpass and associated station entrances, two new lifts and stairway canopy structures.	Considering the existing station heritage character, vegetation surroundings, the level of current maintenance and scope of work, the sensitivity of LCZ 1 is considered to be Moderate.	The magnitude of change would be Moderate. Although the scale of the proposed changes would be similar to the larger pieces of existing infrastructure at the station, the materials proposed for the new elements would differ to the existing station.	Moderate
LCZ 6: High Density Residential	The proposed work would lie adjacent to a small portion of the LCZ on Alexandria Parade and the proposed changes would not alter the character within the LCZ.	N/A	N/A	No change
LCZ 8: Mixed Use / Light Industrial	The proposed work would lie adjacent to a small portion of the LCZ, be consistent with the existing station setting and would not alter the character within the LCZ.	N/A	N/A	No change

Visual impact assessment

Construction phase

Visible construction elements would be expected to typically include excavation machinery, site sheds, hoardings, equipment, plant and heavy vehicles bringing in and unloading materials. A temporary construction compound at the existing commuter car park would be required to accommodate a site office, amenities, and construction compound and laydown area for materials (Figure 3-3). Other construction ancillary sites would also be required for materials storage, laydown and construction areas for the new pedestrian underpass. These visual impacts would be visually prominent but are considered to be consistent with similar temporary construction work sites, and transitory over a period of up to 18 months until completion of the Proposal.

Operation phase

The Proposal would introduce new elements and built forms in the visual environment including the new pedestrian underpass and northern station entrance, two new lifts, walkways, a pedestrian crossing and removal and reconfiguration of existing parking arrangements. An assessment of the visual sensitivity and magnitude of change at each visual receptor location was undertaken for the operational phase of the Proposal. The results of this assessment are provided in Table 6-4.

A photomontage was produced to illustrate the proposed changes from three key viewpoints. These are shown in Figure 6-5, Figure 6-7 and Figure 6-9.

Table 6-4 Operational visual impact assessment

Viewpoint and location	Anticipated change	Sensitivity to change	Magnitude of change	Rating
Viewpoint 1 Magpies Waitara	The key changes to the view would comprise the new pedestrian crossing, pedestrian underpass and associated station entrances, two new lifts and stairway canopy structures (refer to Figure 6-5).	The sensitivity would be low as patrons of Magpies Waitara are likely to be focussed on their visit to the entertainment centre, while receptors travelling along the road would be focused on their view within the road corridor at street level.	The magnitude of change would be low given the changes would be viewed from a distance (around 90 metres) and only occupy a small fraction of the view.	Low (neutral)
Viewpoint 2 Intersection of Orara Street and Alexandria Parade, Waitara	The key changes to the view would comprise the new pedestrian crossing, pedestrian underpass and associated station entrances, two new lifts and stairway canopy structures and vegetation loss (refer to Figure 6-7).	The sensitivity would be low as residents would be moderately focused on the view as they entered and left their premises. Receptors travelling along the road would be focused on their view within the road corridor at street level, however the new station entrance would be a key feature in this view.	The magnitude of change would be high as the new station entrance would be visually prominent from this viewpoint.	Moderate (neutral)
Viewpoint 3 Alexandria Parade Overbridge, Waitara	The key changes to the view would comprise the new lift, new stairs and associated canopies on the platform.	The sensitivity would be low as commuters would typically have a low interest in views to the rail corridor and pedestrians, cyclists and motorist receptors are likely to only get very short, partial views of the changes as they pass the overbridge	The magnitude of change would be low as changes at the northern end of the platform would be a similar scale to that of the other rail buildings within the corridor.	Low (neutral)
Viewpoint 4 Intersection of Pattinson Avenue and Romsey Street, Waitara	The key changes to the view would comprise the new northern station entrance from the commuter car park, two new lifts and stairway canopy structures.	The sensitivity would be low as employees of visitors to the businesses on Pattinson Avenue and Romsey Street would be focussed on tasks within the building rather than the external landscape. Passers-by would only have a casual interest in the views as they move along the street.	The magnitude of change would be low as although the new station infrastructure would be clearly seen, they would occupy only a small portion of the middle to background of the view.	Low (neutral)

Viewpoint and location	Anticipated change	Sensitivity to change	Magnitude of change	Rating
Viewpoint 5 Waitara Station Commuter Car Park	The key changes to the view would comprise the reconfigured commuter car park, new northern station entrance from the commuter car park, two new lifts and stairway canopy structures on the station platform (refer to Figure 6-9).	The sensitivity would be low as commuters would expect to see station infrastructure within this view and would have a casual interest in the views as they move through the commuter car park.	The magnitude of change would be low as the new station infrastructure would be consistent with the existing station setting.	Low (neutral)

Figure 6-4 Existing view towards Waitara Station from Magpies Waitara (viewpoint 1)

Figure 6-5 Photomontage of the proposed view towards Waitara Station from Magpies Waitara - Indicative only, subject to detailed design (viewpoint 1)

Figure 6-6 Existing view towards Waitara Station from the intersection of Orara Street and Alexandria Parade (viewpoint 2)

Figure 6-7 Photomontage of the proposed view towards Waitara Station from the intersection of Orara Street and Alexandria Parade - Indicative only, subject to detailed design (viewpoint 2)

Figure 6-8 Existing view towards Waitara Station from the commuter car park (viewpoint 5)

Figure 6-9 Photomontage of the proposed view towards Waitara Station from the commuter car park - Indicative only, subject to detailed design (viewpoint 5)

6.2.3 Mitigation measures

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

The detailed design of the Proposal is to be undertaken with reference to the recommendations included in the Landscape Character and Visual Impact Assessment (AECOM, 2022c). These recommendations include that detailed design would consider:

- the use of brick elements within the design of the station landscaping, particularly new planted beds and retaining walls, to reference the existing brick used in landscape elements and assist in visually 'bedding down' new elements into the landscape
- retaining and reusing materials that are removed due to the Proposal
- minimising light spill from the construction area into adjacent visually sensitive properties 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
- a finish to the proposed pedestrian underpass entrance on Alexandria Parade and retaining walls, including consideration of opportunities for a public artwork or Aboriginal heritage interpretation
- landscaping on the batters to the rail corridor comprising native vegetation of varying heights to reduce the visual prominence of the new infrastructure
- consider opportunities for the 44 replacement trees to be provided to offset tree removal to visually screen the Proposal
- placement of lighting to minimise the upward spread of light at the northern end of the station where the station is elevated above the adjacent road corridor and tall residential apartments buildings are in the surrounding landscape. Care would be taken when selecting lighting to ensure that light spill and glare are kept to a minimum
- minimising disturbance to vegetation limited to the minimum amount necessary to construct the proposal
- inclusion of measures to limit or deter graffiti on proposed structures.

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

6.3 Noise and vibration

A Noise and Vibration Impact Assessment (AECOM, 2022a) was undertaken for the Proposal, which included the following scope:

- establish the existing background noise levels in the vicinity of the Proposal
- establish construction noise management levels (NMLs) and vibration limits that would apply to the Proposal
- predict environmental noise and vibration levels at nearby residential and other sensitive receivers due to the Proposal
- predict noise levels from additional off-site construction traffic generated by the Proposal
- recommend mitigation measures, where necessary, to reduce and manage noise and vibration impacts from the Proposal to comply with established construction NMLs and vibration limits

- consider noise from the operation of the upgraded Waitara Station.

The findings of this assessment are summarised below.

6.3.1 Existing environment

Waitara Station is located within a mixed-use environment, with predominately light industrial uses located immediately west of the station and mainly residential uses located immediately east of the station.

Receivers predominantly comprise residential properties to the east of the railway line and extend the length of the Proposal area along Alexandria Parade. The residential receivers to the west of the station are generally multi-storey apartment buildings, whilst the receivers to the east comprise one and two storey houses.

Receivers are generally commercial between the railway line and the Pacific Highway. To the west of the Pacific Highway receivers are generally residential, being predominately seniors housing with some commercial and educational receivers.

To provide a comprehensive assessment, 22 representative residential receivers surrounding the Proposal were selected to describe the noise impacts associated with the Proposal. Table 6-5 lists the representative residential receivers surrounding the Proposal area.

Table 6-5 Representative residential receivers surrounding the Proposal

Receiver ID	Noise Catchment Area (NCA)	Address	Building type	Distance from Proposal (metres)
R1	2	14 Waitara Avenue, Waitara	Multi-storey	48
R2	2	11 Orara Street, Waitara	Multi-storey	76
R3	1	2 McAuley Place, Waitara	Detached	95
R4	1	8 McAuley Place, Waitara	Detached	155
R5	1	65 Pacific Highway, Waitara	Multi-storey	157
R6	2	57 Alexandria Parade, Waitara	Detached	168
R7	1	108 McAuley Place, Wahroonga	Townhouse	218
R8	2	15 Yardley Avenue, Waitara	Detached	234
R9	2	18 Park Avenue, Waitara	Multi-storey	245
R10	2	3 Thomas Street, Hornsby	Multi-storey	254
R11	2	45 Waitara Avenue, Waitara	Multi-storey	316
R12	2	67 Alexandria Parade, Waitara	Detached	334
R13	2	27 Yardley Avenue, Waitara	Detached	362
R14	2	26 Balmoral Street, Waitara	Detached	377
R15	1	2C Carden Avenue, Wahroonga	Townhouse	387
R16	2	40 Park Avenue, Waitara	Multi-storey	423
R17	2	7 Edgeworth David Avenue, Hornsby	Multi-storey	427

Receiver ID	Noise Catchment Area (NCA)	Address	Building type	Distance from Proposal (metres)
R18	2	3 Clarke Road, Waitara	Detached	450
R19	2	46 Balmoral Street, Waitara	Detached	456
R20	2	28 Myra Street, Wahroonga	Detached	486
R21	1	12B Woolcott Avenue, Wahroonga	Detached	490
R22	2	4 Myra Street Wahroonga	Detached	491

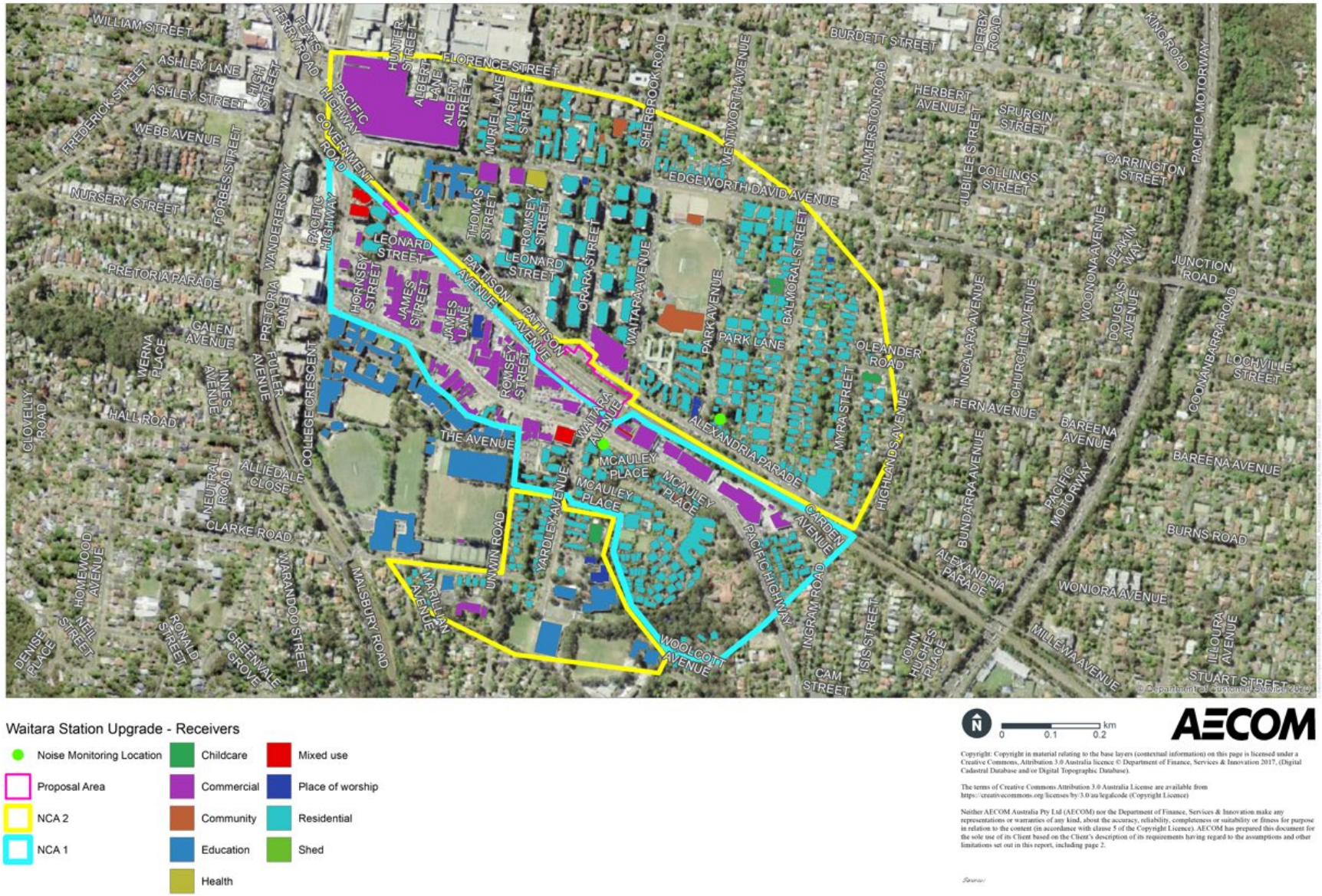
Thirteen representative non-residential receivers surrounding the Proposal were selected to describe the noise impacts associated with the Proposal. The representative non-residential receivers surrounding the Proposal are shown in Table 6-6.

Table 6-6 Representative non-residential receivers surrounding the Proposal

Receiver ID	Address	Distance from Proposal (metres)
N1	Volvo Car Dealer, Waitara	25
N2	Magpies Leagues Club, Waitara	36
N3	Hornsby Mazda, Waitara	54
N4	Waitara Seventh-day Adventist Church, Waitara	131
N5	PCYC Hornsby, Hornsby	181
N6	Barker College, Hornsby	221
N7	Bars N Racks Sydney (auto parts shop), Hornsby	251
N8	Centacare Children's Services Waitara, Waitara	253
N9	Edgeworth Medical Centre, Hornsby	344
N10	Explore & Develop Childcare Centre, Waitara	371
N11	Wallarobba Arts and Cultural Centre, Hornsby	464
N12	St Leo's Catholic College, Wahroonga	477
N13	Westfield Hornsby	515

To assist in determining noise criteria for the receivers surrounding the Proposal, two noise catchment areas (NCAs) were identified. The noise environment at each of the residential receivers within each NCA is considered to be similar.

The representative receivers and NCAs are shown in Figure 6-10 and shown by receiver ID in Figure 6-11. The applicable NCA for the representative residential receivers are identified in Table 6-6. NCA 1 includes receivers adjacent to the Pacific Highway for a distance of up to around 250 metres and generally has a higher background noise level associated with traffic movements on the Pacific Highway. NCA 2 includes receivers beyond this distance from the Pacific Highway and receivers on the eastern side of the station which generally have a lower (and similar) background noise level being further away from the Pacific Highway.



Copyright: Copyright in material relating to the base layers (contextual information) on this page is licensed under a Creative Commons, Attribution 3.0 Australia licence © Department of Finance, Services & Innovation 2017, (Digital Cadastral Database and/or Digital Topographic Database).

The terms of Creative Commons Attribution 3.0 Australia License are available from https://creativecommons.org/licenses/by/3.0/au/legalcode (Copyright Licence)

Neither AECOM Australia Pty Ltd (AECOM) nor the Department of Finance, Services & Innovation make any representations or warranties of any kind, about the accuracy, reliability, completeness or suitability or fitness for purpose in relation to the content (in accordance with clause 5 of the Copyright Licence). AECOM has prepared this document for the sole use of its Client based on the Client's description of its requirements having regard to the assumptions and other limitations set out in this report, including page 2.

Source:

Figure 6-10 Noise and vibration receivers and NCAs and logger locations

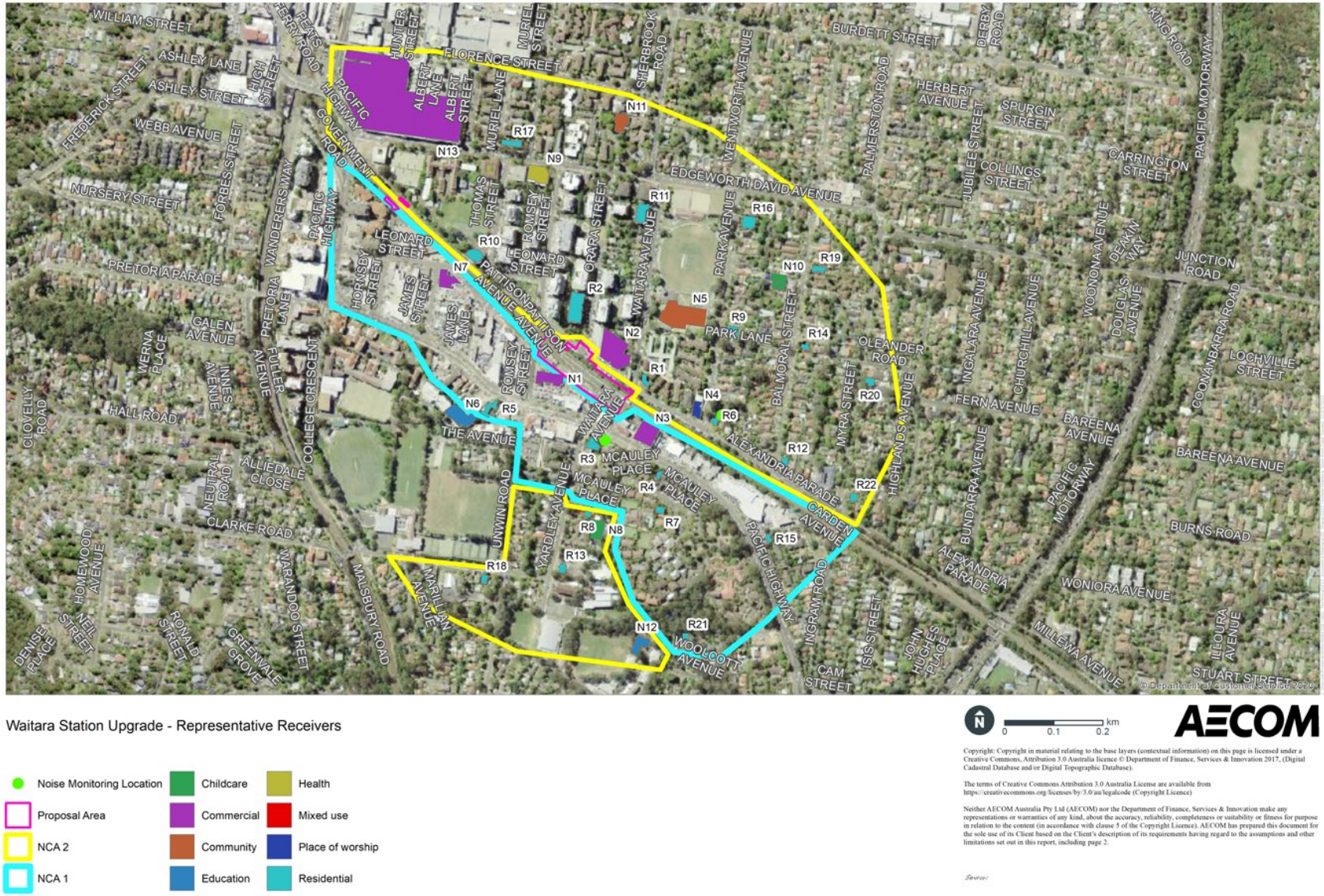


Figure 6-11 Representative receiver locations

Background noise levels

Long term unattended and short term attended measurements were undertaken to establish the existing ambient and background noise environment at potentially affected receivers.

Unattended noise monitoring

Long term unattended noise monitoring was conducted between 14 and 23 October 2020 at 2 McAuley Place (logger location 1), and between 23 October and 3 November 2020 at 59 Alexandria Parade (logger location 2). Table 6-7 presents the existing overall representative L_{Aeq} ambient noise level and the background L_{A90} noise levels for the day, evening and night periods. The L_{A90} noise levels are the levels exceeded for 90% of the measurement period, while the L_{Aeq} level is the equivalent continuous sound level.

Table 6-7 Existing background and ambient noise levels

Location	Rating background level, LA90, dB(A)			Ambient LAeq noise levels, dB(A)		
	Day[1]	Evening[1]	Night[1]	Day[1]	Evening[1]	Night[1]
NCA 1	52	47	38	65	64	61
NCA 2	38	34	32	71	67	66

Notes:

1. *Day is defined as 7:00 am to 6:00 pm, Monday to Saturday and 8:00 am to 6:00 pm Sundays & Public Holidays. Evening is defined as 6:00 pm to 10:00 pm, Monday to Sunday & Public Holidays. Night is defined as 10:00 pm to 7:00 am, Monday to Saturday and 10:00 pm to 8:00 am Sundays & Public Holidays.*

Attended noise monitoring

Attended noise measurements were conducted at the two unattended monitoring locations on 14 October 2020. The measurement was conducted over a 15-minute period for each location. Weather conditions were sunny on the day of monitoring, with no wind. The results of the attended noise monitoring are presented in Table 6-8.

Table 6-8 Attended noise measurements

Logger	Date	Time	L_{Aeq} dB(A)	L_{A90} dB(A)	Comments
1	14/10/2020	9:18 am	68	53	Noise environment dominated by road traffic noise on Pacific Highway. Truck pass-by 78 dB(A). Bus braking 66 dB(A). Local vehicle traffic 62 dB(A). Birds chirping (42 dB(A)) and mild breeze noise contributes to the noise environment.
2	14/10/2020	9:42 am	59	46	Noise environment dominated by road traffic noise on Alexandria Parade and Pacific Highway in background. Train pass-by 63 dB(A). Local vehicle traffic 60 dB(A). Birds chirping (50 dB(A)) and mild breeze noise contributes to the noise environment.

The acoustic environment is dominated by road traffic noise at both logging locations with natural sounds in the background. Intermittent rail noise is also audible. These characteristics are typical of a suburban environment.

6.3.2 Noise assessment criteria

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: 7:00am to 6:00pm
- Saturday: 8:00am to 1:00pm
- Sundays and public holidays: no work.

The ICNG also states that during recommended standard hours where construction noise levels reach 75 dB(A) at residences, residential receivers can be considered as 'highly noise affected' and the proponent may be required to consider restricting hours of very noisy work to provide respite periods.

Further, NMLs were developed for the Proposal. Where NMLs are predicted to be exceeded, the ICNG recommends certain measures to be implemented to minimise adverse impacts. NMLs for the Proposal during standard construction hours is the applicable rating background level (RBL) + 10 dB(A), while the NML outside of recommended standard hours is the applicable RBL + 5 dB(A).

The construction NMLs for the residential and non-residential receivers are detailed in Table 6-9 and Table 6-10.

Table 6-9 Construction NMLs – residential receivers

NCA	Period	RBL, L_{A90} dB(A)	Standard hours noise management levels, $L_{Aeq,15min}$, dB(A)		Out-of-hours noise management levels, $L_{Aeq,15min}$, dB(A)
1	Day	52	62	75 (highly noise affected level)	57
	Evening	47	N/A		52
	Night	38	N/A		43
2	Day	38	48	75 (highly noise affected level)	43
	Evening	34	N/A		39
	Night	32	N/A		37

Table 6-10 Construction NMLs – non-residential receivers

Land use	Noise management levels, LAeq,15min (applies when properties are in use)
Place of worship	55 dB(A)[1]
Community Hall	55 dB(A)[1]
Commercial premises (including offices, retail outlets)	70 dB(A)

Land use	Noise management levels, LAeq,15min (applies when properties are in use)
Industrial	75 dB(A)
Classroom at schools and other educations institutions	55 dB(A) [1]
Hospital wards and operating theatres	55 dB(A) [1]

Notes:

1. *This external management level is based upon a 45 dB(A) internal noise management level and a 10 dB reduction from outside to inside through an open window.*

Sleep disturbance criteria

Sleep disturbance noise goals have also been established for residential receivers which are based on the *NSW Road Noise Policy* (Department of Environment, Climate Change and Water, 2011). Based on the measured background noise levels during the night, the sleep disturbance criteria for the nearest noise sensitive residential receivers are presented in Table 6-11.

Table 6-11 Sleep disturbance criteria

NCA	Background noise level (L_{A90}), dB(A)	Sleep disturbance criteria, $L_{A1(1\ minute)}$, dB(A) (external)	
		Screening level	Awakening reaction
1	38	53	60 – 65
2	32	47	60 – 65

Construction traffic noise criteria

To assess noise impacts from construction traffic an initial screening test is required, by evaluating whether existing road traffic noise levels would increase by more than 2 dB(A), in line with the *Road Noise Policy*. Where the predicted noise increase is 2 dB(A) or less, then no further assessment is required. However, where the predicted noise level increase is greater than 2 dB(A), and the predicted road traffic noise level exceeds the road category specific criterion then noise mitigation should be considered for those receivers affected.

Construction vibration criteria

When assessing vibration there are two categories of vibration criteria: one related to the impact of vibration to human comfort (tactile vibration) and one relating to structural damage.

Structural damage to buildings

At present, no Australian Standards exist for the assessment of building damage caused by vibration.

The German standard (DIN 4150) provides recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration. DIN 4150 states that buildings exposed to higher levels of vibration than recommended limits would not necessarily result in damage.

Human comfort

The assessment of intermittent vibration outlined in the A*ssessing Vibration: A Technical Guideline* is based on Vibration Dose Values (VDVs). The VDV accumulates the vibration energy received over the daytime and night-time periods.

The VDV criteria are based on the likelihood that a person would be annoyed by the level of vibration over the entire assessment period.

Operational noise criteria

The NSW *Noise Policy for Industry* (NPfI) (NSW EPA, 2017) provides guidance in relation to acceptable noise limits for industrial noise emissions, which includes, but is not limited to, noise emissions from mechanical plant (NSW EPA, 2017). The assessment procedure in the NPfI has two components:

- controlling intrusive noise impacts in the short term for residences
- maintaining noise level amenity for residences and other land uses.

Both components are assessed at the boundary of the noise sensitive receiver site, or if the site boundary is more than 30 metres from the noise sensitive building, a distance of 30 metres from the noise sensitive building.

The specific noise levels established for the operation of the Proposal are summarised in Table 6-12 and are based on the lower of the intrusive and amenity criteria. The criteria apply to environmental noise emissions from plant and equipment installed as part of the Proposal.

Table 6-12 Summary of environmental noise emission criteria

Location	Time of day	Intrusive criteria L_{Aeq}, dB(A)	Amenity criteria L_{Aeq}, dB(A)	Project specific noise levels criteria[1] L_{Aeq}, dB(A)
NCA 1	Day	57	58	57
	Evening	52	48	48
	Night	43	43	43
NCA 2	Day	43	58	43
	Evening	39	48	39
	Night	37	43	37
School classroom	Noisiest 1-hour period when in use		48	48
Place of worship	When in use	-	53	53
Active recreation area	When in use	-	58	58
Commercial premises	When in use	-	68	68

Notes:

[1] *Project noise trigger levels represent the lower of the intrusive and amenity criteria.*

6.3.3 Potential impacts

Construction phase

Noise

Eight distinct work packages, each consisting of a number of construction activities, were assessed for the Proposal. All work packages have been assessed with the exception of the final package 8 ‘Demobilising, testing and commissioning’, as this is expected to be a relatively low noise impact activity. The work packages would occur in line with the following scheduling:

1. Site establishment and enabling work
2. New pedestrian underpass
3. New northern station entrances
4. New lifts, stairs and platform upgrades
5. Station building reconfiguration
6. Interchange works
7. Service and utilities upgrade work
8. Demobilisation, testing and commissioning.

Noise from activities within the construction compounds has been assumed to be minor in comparison to the noise generated by the worst case work packages assessed.

In order to assess noise impacts from the site during construction, a noise model was created to represent ‘reasonable’ worst periods of upgrade work.

Residential receivers

A summary of the predicted construction noise levels for each work stage during standard working hours for residential receivers is shown in Table 6-13. These results show that there are a number of exceedances of the NMLs during the daytime for all work stages. The largest numbers of exceedances occur during work package 5 – Station building reconfiguration, however the highest noise levels are experienced during work package 2 – New pedestrian underpass at R2, which may be ‘highly affected’ at times (i.e. a construction noise level of 75 dB(A) or greater).

Table 6-13 Predicted noise impacts at representative residential receivers for each work package during standard hours

Receiver ID[1]	NCA	Distance, metres	Standard hours NML, dB(A)	Highly affected noise level, dB(A)	Work Package[2]						
					1	2	3	4	5	6	7
R1	2	48	48	75	**52**	**61**	**56**	**62**	**67**	**59**	**60**
R2	2	76	48	75	**64**	**76**	**71**	**74**	**64**	**73**	**68**
R3	1	95	62	75	39	61	56	62	**65**	57	52
R4	1	155	62	75	36	46	40	48	51	46	37
R5	1	157	62	75	41	46	40	46	57	40	37
R6	2	168	48	75	43	**51**	39	**52**	**55**	**49**	39
R7	1	218	62	75	29	42	36	45	48	40	33
R8	2	234	48	75	22	31	26	30	30	27	23
R9	2	245	48	75	45	**56**	**49**	**56**	**56**	48	47
R10	2	254	48	75	**54**	**59**	**53**	**59**	**54**	**52**	**50**
R11	2	316	48	75	31	39	33	41	50	32	29
R12	2	334	48	75	22	33	28	33	32	27	26
R13	2	362	48	75	24	40	34	34	42	34	32
R14	2	377	48	75	24	35	22	35	36	30	27
R15	1	387	62	75	38	49	43	49	48	44	40
R16	2	423	48	75	27	34	28	36	**51**	27	25
R17	2	427	48	75	47	37	27	38	31	28	24
R18	2	450	48	75	30	30	25	34	30	28	24
R19	2	456	48	75	36	32	26	**49**	45	45	23
R20	2	486	48	75	37	47	43	48	46	42	40
R21	1	490	62	75	26	34	29	37	35	31	26
R22	2	491	48	75	39	46	39	47	44	43	36

Notes:

1. *Addresses of receivers and noise catchment areas are provided in Table 6-5*
2. *Bold items shaded in grey indicate the predicted noise levels at this receiver during this work package exceed the daytime NMLs. Items in red indicate the receiver is highly noise affected during this work package.*

A summary of the predicted construction noise levels for each work package outside standard working hours for residential receivers is shown in Table 6-14.

These results show construction noise levels are predicted to exceed the NMLs outside standard operating hours (including at night) for all assessed construction work packages at most representative receivers. The highest noise levels are experienced during work package – 2, 4 and 5. Overall, there are exceedances at receivers R1 to R7, R9 to R11, R13, R15 to R17, R19, R20 and R22. Noise levels at receivers R1 and R2 are predicted to exceed the NMLs by more than 25 dB(A) at times. However, these exceedances would be limited to the rail shutdown periods. In addition, night work would not be undertaken for more than two consecutive nights.

Table 6-14 Predicted noise impacts at representative residential receivers for each work package outside standard hours

Receiver ID[1]	NCA[2]	Distance (metres)	Night-time NML,	Work Package					
			(dB(A))	2	3	4	5	6	7
R1	2	48	37	**61**	**56**	**62**	**67**	**59**	**60**
R2	2	76	37	**76**	**71**	**74**	**64**	**73**	**68**
R3	1	95	43	**61**	**56**	**62**	**65**	**57**	**52**
R4	1	155	43	**46**	40	**48**	**51**	**46**	37
R5	1	157	43	**46**	40	**46**	**57**	40	37
R6	2	168	37	**51**	**39**	**52**	**55**	**49**	**39**
R7	1	218	43	42	36	**45**	**48**	40	33
R8	2	234	37	31	26	30	30	27	23
R9	2	245	37	**56**	**49**	**56**	**56**	**48**	**47**
R10	2	254	37	**59**	**53**	**59**	**54**	**52**	**50**
R11	2	316	37	**39**	33	**41**	**50**	32	29
R12	2	334	37	33	28	33	32	27	26
R13	2	362	37	**40**	34	34	**42**	34	32
R14	2	377	37	35	22	35	36	30	27
R15	1	387	43	**49**	43	**49**	**48**	**44**	40
R16	2	423	37	34	28	36	**51**	27	25
R17	2	427	37	37	27	**38**	31	28	24
R18	2	450	37	30	25	34	30	28	24
R19	2	456	37	32	26	**49**	**45**	**45**	23
R20	2	486	37	**47**	**43**	**48**	**46**	**42**	**40**
R21	1	490	43	34	29	37	35	31	26
R22	2	491	37	**46**	**39**	**47**	**44**	**43**	36

Notes:

1. *Addresses of receiver and noise catchment areas are provided in Table 6-5*
2. *Bold items shaded in grey indicate the predicted noise levels at this receiver during this work package exceed the daytime NMLs. Items in red indicate the receiver is highly noise affected during this work package.*

Non-residential receivers

A summary of the predicted construction noise levels for non-residential receivers is shown in Table 6-15. These are the Volvo Car Dealer (N1) (work package 1 – 4, 6), Magpies Leagues Club Waitara (N2) (work package 2 to 5), and PCYC Hornsby (N5) (work package 4 and 5). Key noisy activities include the use of concrete saws, jack hammers and bored piling. For receiver N1 an exceedance of up to 16 dB(A) is predicted for Work Package 4 which would be of limited duration. It is also noted that the predicted noise levels are based on all equipment operating at once and at the closest location to each receiver, therefore noise levels would be lower for significant periods of time.

Table 6-15 Predicted noise impacts at representative non-residential receivers

Receiver ID[1]	Distance (metres)	NML (dB(A))	Work Package						
			1	2	3	4	5	6	7
N1	25	70	**79**	**82**	**71**	**86**	67	**74**	68
N2	36	70	57	**76**	**71**	**76**	**74**	**79**	69
N3	54	70	48	57	45	58	63	57	47
N4	131	55	33	41	34	43	49	36	34
N5	181	55	46	50	45	**57**	**62**	50	38
N6	221	55	35	42	36	42	45	39	33
N7	251	70	50	57	50	55	50	49	48
N8	253	55	20	35	30	31	37	33	27
N9	344	55	45	38	28	38	33	31	25
N10	371	55	37	31	26	51	49	44	23
N11	464	55	34	50	45	50	41	44	42
N12	477	55	25	33	27	36	34	31	25
N13	515	70	54	48	33	48	36	42	30

Notes:

1. *Addresses of receiver areas are provided in Table 6-6*
2. *Bold items shaded grey indicate predicted noise levels at this receiver during this work package exceed the NML*

Sleep disturbance

The awakening reaction criterion of 65 dB(A) is predicted to be exceeded at residents along Yardley Avenue, Waitara Avenue, Orara Street, and Alexandria Parade during work packages 2 to 5. In addition, the awakening reaction may be exceeded at residential receivers along Leonard Street during work package 1 and Orara Street during work package 7.

The typical outdoor to indoor noise reductions provided by most standard dwellings (i.e. without acoustical treatment) is generally accepted as being 10 dB with windows slightly open and a minimum of 20 dB with windows closed. Therefore, by closing their windows during noisy activities residents can potentially attenuate external noise levels by 20 dB which would result in internal noise levels which are less than the sleep awakening criterion. In addition, the predicted construction noise levels are typically the worst case noise levels, therefore the majority of the actual $L_{A1(1min)}$ noise levels are likely to be less than those predicted.

Construction traffic

The numbers of construction vehicles have been estimated by Transport for a rail shutdown period to be up to 45 heavy vehicles and 40 light vehicles per shift for travel to and from the Proposal area. For a normal weekday, up to 25 heavy vehicles and 30 light vehicles are expected. Vehicles would access the site primarily via Alexandria Parade, and some vehicles would access the site from Romsey Street, Pattison Avenue and Leonard Street.

Traffic noise levels during construction would not increase by more than 2 dB on Waitara Avenue or Alexandria Parade, which complies with the *Road Noise Policy* criteria. There would be intermittent use of the rail corridor during rail possessions between the compound/ancillary sites and the station to transport plant and material. Noise from these movements would be similar in nature to the existing Sydney Trains rail movements passing through and stopping at Waitara Station. Therefore noise associated with these movements is not anticipated to impact nearby residents.

Construction vibration

Vibration intensive work may include the use of the following items of equipment:

- jackhammer
- bored piling rig.

The minimum working distances of these items of equipment from off-site receivers are shown in Table 6-16 which is based on recommendations of the Transport Construction Noise and Vibration Strategy. Waitara Station's platform building, island platform and underpass (subway) are a locally listed heritage item under 'Waitara Railway Station Group' on the TAHE Section 170 Heritage and Conservation Register. Therefore, the cosmetic damage levels for heritage items would be considered.

Vibration intensive work would likely be required within the minimum working distances of the significant heritage elements associated with the station (such as the ticket booths and station building). If these minimum working distances are complied with, no adverse impacts from vibration intensive work is likely in terms of human response or cosmetic damage.

It is unlikely that work would be undertaken within the minimum working distances for heritage, commercial and residential receivers during the proposed vibration intensive work, with the exception of heritage items at the station itself. Should work be required within the minimum working distances, the recommended additional mitigation measures would be implemented.

If vibration intensive work is required within these minimum working distances, mitigation measures to control excessive vibration would be implemented as outlined in Section 7.2.

Table 6-16 Minimum working distances of vibration intensive equipment to be used during the Proposal.

Plant	Rating/ description	Cosmetic damage - heritage	Cosmetic damage - residential/commercial	Human response
Jackhammer	Handheld	1 metre (nominal)	1 metre (nominal)	Avoid contact with structure
Bored piling	≤ 800 mm	4 metres	2 metres	N/A

Operational phase

Operation of the Proposal including the addition of two lifts would not produce notable noise emissions, and as such, the operational noise environment is expected to remain largely unchanged. Standard noise controls such as appropriate selection of mechanical plant and periodic maintenance would reduce any potential noise emissions. If required, operational noise emissions would be addressed during the detailed design phase to comply with operational noise criteria as per the *Noise Policy for Industry.*

6.3.4 Mitigation measures

Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the Construction Noise and Vibration Strategy (Transport for NSW, 2019a) and the Noise and Vibration Impact Assessment (AECOM, 2022a) and in consultation with impacted receivers.

The CNVMP would prescribe reasonable and feasible mitigation measures to minimise construction noise and vibration. The measures would focus on contractor inductions, selection and operation of plant and equipment, work scheduling (including respite periods), prescribing safe working distances for vibration intensive equipment, procedures for noise and

vibration monitoring and obtaining approvals for out of standard hours work. The CNVMP would also detail requirements for managing potential vibration impacts to heritage structures through monitoring and safe working distances.

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

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

6.4 Aboriginal heritage

6.4.1 Existing environment

The Proposal is located on the traditional lands of the Darug and Guringai people who occupied and thrived in the Hornsby area prior to European occupation.

An AHIMS search was undertaken for a 50 metre radial buffer around the Proposal on 18 February 2022. No AHIMS sites were identified in the search.

Certain landscape features, such as waterways, sand dune systems, ridge tops, ridge lines, headlands, cliff faces and rock caves/shelters, can indicate the likely presence of Aboriginal sites. None of these features are present immediately surrounding the station, which is located within a disturbed and developed area (i.e. a rail corridor surrounded by predominantly residential and commercial development). Therefore, the Proposal is not considered to be located within a high-risk landscape for Aboriginal heritage potential. The extensive landscape modification and high level of disturbance that has occurred due to development of the rail corridor across the Proposal area suggests that the presence of culturally sensitive buried items is unlikely within the boundaries of the Proposal.

6.4.2 Potential impacts

Construction phase

Construction of the Proposal would involve some minor excavation and other ground disturbance, including:

- excavation of the pedestrian underpass at the new northern station entrance
- excavation at each proposed lift location for the lift foundations and pits
- minor excavation for construction of upgraded access paths including pavement resurfacing.

Ground disturbing activities have the potential to impact Aboriginal sites if present. As no known Aboriginal heritage items are located in the vicinity of the Proposal and no high-risk landscaping features are located at or near the Proposal, the potential for unknown items to be present is considered to be low. As such, the Proposal is unlikely to affect Aboriginal heritage during construction.

Operational phase

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

6.4.3 Mitigation measures

If previously unidentified Aboriginal sites or objects are uncovered during construction, work would cease in the vicinity of the find in accordance with Transport's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019g). The Transport Project Manager and Transport Senior Environment and Sustainability Officer would be notified immediately to assist in coordinating the next steps, which are likely to involve consultation with an archaeologist,

Heritage NSW and the Local Aboriginal Land Council/s. If human remains are found, work would cease, the site would be secured and the NSW Police and Heritage NSW would be notified.

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

6.5 Non-Aboriginal heritage

A Statement of Heritage Impact (SoHI) was prepared by AECOM for the Proposal (AECOM, 2022b). The SoHI was prepared in order to provide an understanding of the impact of the Proposal to heritage items within the Proposal area, namely the Waitara Railway Station Group.

6.5.1 Existing environment

A desktop search of non-Aboriginal heritage registers was undertaken to assess the extent of known historical heritage items in proximity to the Proposal. This included a search of the:

- World Heritage List
- Commonwealth Heritage List
- Register of the National Estate (non-statutory archive)
- NSW State Heritage Register (SHR)
- RailCorp Section 170 Heritage and Conservation Register
- Hornsby LEP 2013.

Waitara Railway Station Group is listed on the TAHE Section 170 Heritage and Conservation Register as holding local heritage significance. This item and other heritage listed items within the vicinity of the Proposal are listed in Table 6-17. No heritage items were found from the World Heritage List, the National Heritage List, the Commonwealth Heritage List, the Register of the National Estate and the State Heritage Register.

No impacts are proposed to heritage items outside Waitara Station as a result of this Proposal. As such, these items are not considered further in this assessment.

Table 6-17 Summary of listed heritage items within and adjacent to the Proposal area

Heritage list	Heritage item	Level of significance	Distance to Proposal area (metres)
TAHE Section 170 Heritage and Conservation Register	Waitara Railway Station Group (SHI #4802058)	Local	N/A
Hornsby LEP 2013	Street Trees, Alexandria Parade (#772)	Local	30
Hornsby LEP 2013	Curiosity Shop, 37 Alexandria Parade, Waitara (#773)	Local	50
Hornsby LEP 2013	Waitara Park (#783)	Local	18
Hornsby LEP 2013	Barker College Heritage Conservation Area	Local	165
Hornsby LEP 2013	Barker College Centenary Design Centre, McCaskill Music Centre and Development Office (#782)	Local	165
Hornsby LEP 2013	Shop (#773)	Local	16

Historical context

Waitara Station was not envisaged until the early 1890s, when land was to be developed for subdivisions to the south of Hornsby and a mode of transport to support them was required. The original Waitara Station consisted of a narrow timber platform with a single waiting shed.

Waitara Station has been subject to a number of modifications since its opening in 1887. The original fabric and known upgrades include:

- 1890 – construction of a timber platform and timber waiting shed
- 1909 – construction of an island platform, brick subway entrance, Station Master's house
- 1938 – construction of ticket booths
- 1966 – replacement of the original ticket booth with a new booking office
- 1960s – modification of the ticket booth and removal of the awning and fencing
- 1960s – addition of hard wearing surface to the platform
- 1979 – removal of the Station Master's house and construction of the first half of the car park
- 1998 – addition of roof over the Subway entrance lightwell
- 2000s – upgrade to the commuter car park stair entrance with new treads and landings
- 2011 – extension to the western platform end (small concrete platform finger extension added).

Significance criteria

Waitara Station has been assessed against the heritage criteria in the TAHE Section 170 Heritage and Conservation Register to determine the level of significance and related statutory protection as outlined in Table 6-18.

Table 6-18 Significance assessment – Waitara Railway Station Group

Significance criteria	Application of criteria
Historical significance **SHR criteria (a)**	Waitara Railway Station has historical significance at a local level, because like many areas, although there was an established community in Waitara by the late 1880s, the construction of the railway encouraged rapid subdivision and the development of the town.
Historical association significance **SHR criteria (b)**	The item does not meet this criterion.
Aesthetic significance **SHR criteria(c)**	Waitara Railway Station has aesthetic significance at a local level. The station is a good example of early twentieth century station design with fabric and details typical of this period and is similar to other rail buildings of the late nineteenth and early twentieth century in the Sydney region. The design of the station building makes a contribution to the overall character of the North Shore line, with its homogenous set of historic station buildings. The station building sits in an elevated position and is clearly visible from both sides of the line and is a well-known local landmark. The elevated position does however detract from the historic setting of the station, as modernisation of the urban environment in Waitara is clearly evident. Other stations on the North Shore line better retain their historic setting because they are screened by trees and/or embankments.
Social significance **SHR criteria (d)**	The place has the potential to contribute to the local community's sense of place and can provide a connection to the local community's past.
Technical/Research significance **SHR criteria (e)**	The item does not meet this criterion.
Rarity **SHR criteria (f)**	The item does not meet this criterion.
Representativeness **SHR criteria (g)**	The platform building, island platform and subway are representative of structures built at Sydney railway stations between 1892 and 1929, particularly the period between 1909 and 1917. The subway, with its high quality bricklaying and ticket collecting booths at the top of the stair, is a particularly fine example of its type.

Significance criteria	Application of criteria
Integrity/Intactness	Although some modifications have been carried out internally, the platform building displays a high level of integrity and intactness. Modern renovations have been carried out in sympathy with the original plan of the building which retains a large amount of original fabric.

The existing Statement of Significance reads as follows:

> *Waitara Railway Station Group has significance at a local level. The present station was opened in 1909 following duplication of the line and relocated slightly north of the original. The station is historically significant for although there was an established community in Waitara by the late 1880s, the construction of the railway encouraged rapid subdivision and the development of the town. Waitara Railway Station has aesthetic significance at a local level as a good example of early twentieth century station design with fabric and details typical of this period and is similar to other rail buildings of the late nineteenth and early twentieth century in the Sydney region. The platform building, island platform and subway are representative of structures built at Sydney railway stations between 1892 and 1929, particularly the period between 1909 and 1917. The subway, with its high quality brickwork and ticket collecting booths at the top of the stair, is a particularly fine example of its type.*

This Statement of Significance was last updated 7 May 2009.

Grading of significant elements to Waitara Railway Station

Different features of Waitara Railway Station have different contributions to its overall heritage significance. As part of the heritage assessment undertaken for the Proposal, features were graded in accordance with the NSW Heritage Division (NSW Heritage Office, 2001) grading criteria, in the following descending order from greatest to lowest (detracting) contribution to the item's heritage significance:

- exceptional
- high
- moderate
- little
- intrusive.

Features within the Waitara Railway Station group have been graded as follows:

- exceptional: nil
- high: Station building (1909), Platforms (1909), Subway (1909)
- moderate: brick walls either side of the staircase entrance from the commuter car park to the subway and ticket collecting booths (1938)
- little: nil
- intrusive: subway modern staircase treads and risers and balustrades, modern stairs and balustrades on the Waitara Avenue entrance to the subway.

Archaeological potential

The presence of archaeological remains in the Proposal area is unlikely, however is also unknown due to multiple previous land developments and upgrades to the station.

The former Station Master's house was located on the southern side of the station, in what is now the commuter car park. The building was likely a brick and weatherboard building, likely

built on raised timber footings. The age of the building is not known, but the house is likely associated with the construction of the 1909 Waitara Station, and not the original 1894 station.

Overlaying historic maps and plans show the building was located at the entrance to the commuter car park. The house remained on the site until the late 1960s, when the site was transformed into the commuter car park.

6.5.2 Potential impacts

Construction phase

Table 6-19 describes the proposed work that may impact the heritage value of Waitara Station.

Table 6-19 Impact of the Proposal to the heritage significance of Waitara Railway Station Group

Significance criteria	Description of impacts
Historical significance criteria (a)	The station's current configuration would be altered due to the construction of a new pedestrian underpass at the northern end of the station. As the existing entrance at the southern end of the station and its historically significant subway would be retained, there would be a negligible impact to the historical significance of the station. The construction of new stairs would result in a moderate physical impact to the platform. However as its historical significance lies in its continued use rather than its fabric, the additional staircase would have a minor impact on the historical significance of the platform. The modification of the station building for the SSE would substantially alter the historical layout of the three rooms, having a major adverse impact on the historical significance of these rooms.
Aesthetic significance criteria (c)	The new pedestrian underpass and station entrances would have a minor adverse impact on the existing platform as these new elements would generally be at ground level and underground. The construction of the proposed lifts would have a minor adverse impact on the aesthetic significance of the station, as the overrun of the new lift on the platform would create new elevated elements that would be visible. However, the design has minimised these impacts to the overall character of the building by relocating the lift away from the aesthetically significant station building. The new stairs on the platform would be a new element, however given the presence of an existing stairway servicing the pedestrian underpass at the southern end of the platform, the new stairs may serve to provide an aesthetic symmetry. The BAZ canopy would have a minor adverse impact on the aesthetic significance of the station, however has been designed to be as lightweight and visually recessive as possible. The aesthetics of the station building rests with its overall external character and its position in the landscape. The modification of the station building for SSE would not impact on these values. Materials and finishes proposed to be used for the Proposal would be sympathetic and consistent with materials for station upgrades. Originally constructed out of timber, the station evolved to be rebuilt using brick, the modern and acceptable building material of the time. Subsequent work through the 1940s through to the 1980s, including the construction of a

Significance criteria	Description of impacts
	new ticket building and later roof over the subway stair entrance, used similar design materials specific to the time, being brick and corrugated iron. The proposed materials for this new work continue the use of modern materials for upgrades to the station which have occurred when required over the last 100 years.
Social significance criteria (d)	The new underpass and station entrance would not impact the social significance of the station. The proposal would provide equitable access to the platform, thereby enhancing its social significance for the community. The construction of lifts would provide equitable access to the island platform, which would allow a wider range of the community to appreciate the heritage significance of the station. The installation of the new lifts would allow for the continued use of the station, and would retain the connection between the local community, the railway station and the wider rail network. The provision of seating, wheelchair spaces and a canopy at the existing BAZ would not impact on the social significance associated with the station. The proposed removal of the current male and female toilet fittings and fixtures, installation of a family accessible toilet, and widening of the entrance doorways would be unlikely to have a negative adverse impact on the social significance associated with this station as the proposed alterations would make the toilets more user friendly.
Representativeness significance criteria (g)	The new pedestrian underpass and station entrances would not significantly impact the platform building, island platform and subway all of which are historically significant. As these items would be retained, so would the ability to interpret these items as representative of early 20th century station buildings. The construction of the new lifts would not have a direct impact on the station building, however the placement of the new lift at the northern end of the platform would have a minor adverse impact to the platform structure. This is however, not expected to have an impact to the representativeness associated with the station. The BAZ canopy would not have a direct impact on the representative significance associated with Waitara Station as the new structure would not have a physical impact on the station building or its other key elements. The internal refitting of both toilets as a family accessible toilet and unisex ambulant toilet would not have a negative impact to the significance under this criterion, as the work would be contained to areas that have already been modified. Externally, the toilet entry door for the new family accessible toilet would be required to be widened to meet DDA compliance. This widening would require alteration to the external façade brickwork to the station building with removal of bricks up to one course of brick wide. This impact is not likely to alter the appearance or intactness of the station building if managed in a sympathetic way.

Summary of heritage impacts

The potential impacts to the Waitara Railway Station have been assessed against the NSW Heritage Division Guidelines (NSW Heritage Office, 2002). A summary of the impacts and their grading is outlined below in Table 6-20.

Table 6-20 Summary of the nature of the direct impacts

Impact Type	Impact
Major negative impacts (substantially affects fabric or values of state significance)	None.
Moderate negative impacts (irreversible loss of fabric or values of local significance; minor impacts on State significance)	The construction of the new northern station entrance including the pedestrian underpass, two new lifts and stairs and associated canopies would have a moderate negative impact to significant heritage fabric. The removal of an internal wall in the station building for the SSE work would have a moderate negative impact, resulting in an irreversible loss of fabric. The modification of the two BAZ to provide seating, wheelchair spaces and a canopy on the platform would have a moderate negative impact on the aesthetic significance associated with the station.
Minor negative impacts (reversible loss of local significance fabric or where mitigation retrieves some value of significance; loss of fabric not of significance but which supports or buffers local significance values)	The removal of original fabric (brickwork) from the station building to widen the entrance door to one of the existing toilets for the creation of the new family accessible toilet, would have a minor negative impact to the station building.
Negligible or no impacts (does not affect heritage values either negatively or positively)	The internal reconfiguration of the existing toilets into the new ambulant toilet, and creation of a family accessible toilet is not considered to have a negative or positive heritage impact. This work would be contained within the existing toilets, which were upgraded recently. All current fixtures and fittings, including tiles, are non-original. The interchange works including new accessible pathways and pedestrian crossing would not have an impact on the heritage significance associated with the station. The regrading of the station platform surface and installation of the tactile ground surface indicators would have a negligible impact to the heritage significance associated with the station.
Minor positive impacts (enhances access to, understanding or conservation of fabric or values of local significance)	None.

Impact Type	Impact
Major positive impacts (enhances access to, understanding or conservation of fabric or values of state significance)	The Proposal would improve safety and accessibility and the station would be enhanced following its refurbishment. The construction of the new lift structures would enable access to and appreciation of the station by a wider demographic.

Potential archaeological impacts

The Proposal area is unlikely to uncover archaeological remains due to the highly developed nature of the land and previous upgrades to the station.

The former Station Master's house raised on timber footings was likely demolished in the late 1960s and work would have likely cleared out any archaeological potential below the footprint of the house. However, deeper structures, such as chimney foundations, and the remains of the rear of house privy may remain on the site.

Excavation is not proposed in the area of the former Station Master's house in the current design of the Waitara station upgrade. If this remains the same, potential impacts to historical archaeological remains associated with the Station Masters' house would be not expected. There are no known areas of archaeological potential located at the northern end of the station.

There are not expected to be archaeological remains associated with the former ticketing office buildings present below the platform surface at the station. Their demolition and subsequent resurfacing work is likely to have removed foundation remains associated with the 1909 and later 1940s ticketing offices.

In the event that any archaeological remains are discovered during construction work, the Heritage Council must be notified under Section 146 of the *Heritage Act 1977.*

Operational phase

The Proposal would not substantially impact non-Aboriginal or archaeological heritage. While there would be minor permanent visual impacts on the heritage setting of the station, this would be offset by the long term benefits by improving accessibility at Waitara Station.

6.5.3 Mitigation measures

A number of site-specific mitigation measures are proposed to minimise the potential heritage impact of the Proposal on the Waitara Railway Station Group.

The following recommendations are made in relation to heritage advice:

- a heritage consultant would be engaged to provide ongoing heritage and conservation advice throughout the detailed design process. In addition to ongoing heritage advice, the nominated heritage consultant shall:
    - undertake heritage fabric analysis of the areas impacted by the work
    - confirm and document options analysis around impacts to significant elements and design mitigation to avoid or reduce adverse impacts, including visual impacts from the intersection of Orara Street and Alexandria Parade
    - ensure that the final design adheres to the relevant policies, including but not limited to the *Heritage Platforms Conservation Management Strategy, Canopies and Shelters: Design Guide for Heritage Stations* and the *Station Access Heritage Conservation Guide*

- the nominated heritage consultant may be required to update this assessment when impacts are defined during the detailed design phase and record the above additional analysis in an updated report.

The following recommendation is made in relation to specialist construction contractors:

- a specialist construction contractor experienced in working with heritage fabric would be engaged to undertake work associated with the widening of the toilet entrances during the construction stage of the Proposal.

The following recommendation is made in relation to the modification for SSE:

- alternatives to the demolition of the wall separating rooms 1 and 2 should be explored. If no feasible alternatives can be found, it is recommended that the existing SSE in its current form is archivally recorded prior to any works taking place.

The following recommendations are made in relation to the station building refurbishment:

- care would be taken when undertaking all demolition work so as not to damage significant fabric. Demolition would be limited to brickwork that may be required to be removed to widen the entry door to both toilets
- any new brickwork should match the original in terms of brick colour, mortar composition and brick orientation (bricks should be laid in the Flemish bond – alternating between header and stretcher alignment)
- new services, including outlets, wall units and brackets should be located internally in areas already modified and/or consolidated in one location. Existing openings in ceilings are the preferred location for the installation of new services. New services and fittings should use existing fixing points or be located at mortar joints
- impacts to the detailed architraves around the current toilet entry door and transom window should be minimised
- new interior tiling should consider the Sydney Trains *Draft – NSW Heritage Station Passenger Tile Finishes (2020).*

The following recommendation is made in relation to the new lifts and stairs design:

- In accordance with Strategy 10 of the *Heritage Platforms Conservation Management Strategy* (Australian Museum Consulting, 2015) and Design in Context, Guidelines for infill development in the historic environment (NSW Heritage Office 2005), the following principles should apply to the detailed design of the new lifts and stairs on the platform:
    - upgrades should support their ongoing use without obscuring or damaging significant built heritage fabric or the integrity of the original designs
    - the new lifts and stairs should not overwhelm the heritage fabric of the platform or associated features, either in scale, mass or colour, and should complement the character of the station precinct. They should also blend into the broader landscape setting of the station.

The following recommendation is made in relation to platform upgrade work:

- where required, platform re-grading would not cover any existing wall vents that have been installed along the lower course of the brickwork to the station building. If cast iron gratings are removed, these should be stored for future reuse.

The following recommendation is made in relation to the BAZ canopy design:

- the height of the eaves associated with the new BAZ canopy should be lower than the height of the eaves of the existing station building. The lower height of the introduced canopy would retain the physical dominance of the heritage station building.

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

6.6 Socio-economic impacts

6.6.1 Existing environment

Waitara is a local and town centre within the Hornsby Shire LGA. Land uses surrounding Waitara Station include high density residential development, industrial and urban services such as car dealerships, schools, retirement villages, churches, food outlets and retail, recreational centres, state emergency services, and NSW Ambulance Wahroonga.

The area is highly characterised by retirement living and educational facilities. There are various retirement villages in the area including The Grande Village located at 2 McAuley Place, Wahroonga and McQuion Park Retirement Village directly adjacent to the station at 35 Pacific Highway, Wahroonga. The retirement village Kokoda Residences located on the at 18 Waitara Avenue, is still under construction and is set for completion by July 2022. There are five schools in the local area including Barker College (91 Pacific Highway), Our Lady of the Rosary Catholic Primary School (23 Yardley Avenue), St Leo's Catholic College (16 Woolcott Avenue), Waitara Public School (Myra Street) and Hornsby Girls High School (12 Edgeworth David Avenue).

The closest residential properties to the Proposal area are located about 50 metres away on Alexandria Parade and comprise multi-storey residential apartments. The closest non-residential land use to the east is Magpies Waitara Rugby League Club located about 65 metres east of the station on Alexandria Parade. The closest non-residential land use to the west is Volvo Car Dealer which abuts the commuter car park.

A review of the Australian Bureau of Statistics 2016 census data provides a brief demographic overview for the suburb of Waitara, with:

- a population of 5,491 people with a median age of 35
- approximately 33% of the population born in Australia
- 67% of people (who are over the age of 15) in full time employment
- 70% of all households as family households, while 27.1% of all households as single person households and 2.8% as group households
- 13.6% of the population are aged over 65
- approximately 42% as using the train as their primary method of travel to work
- 4% of people require help or assistance due to a disability, a long-term injury or age.

The 2021 Census data was not available at the time of preparation of this REF. According to the Scoping Design Report prepared by Stantec for Transport in 2019, the average daily AM peak hour patronage at Waitara Station in 2017 was 1035 and is forecast to increase to 1517 by 2036 (which includes an additional 15% to account for potential increases in population). Within the LSPS (Hornsby Shire Council, 2020a), the suburb of Waitara is identified as a growth area and a housing strategy precinct within the Hornsby LSPS. According to the Hornsby Shire Council's Housing Strategy, between 2016-2021 the population growth was projected to be greatest in the suburbs of Waitara and Asquith. In the Hornsby Shire LGA, Waitara had the highest proportion of high-density dwellings (75.2%) followed by Hornsby.

The Hornsby LSPS (Hornsby Shire Council, 2020a) outlines strategic plans and priority issues for the community. A demonstration of how the Proposal responds to the key relevant priorities for the Hornsby Shire Council area is provided in Table 2-1.

6.6.2 Potential impacts

Construction phase

Construction of the Proposal has the potential to temporarily impact customers, pedestrians, residents, motorists, local businesses and other receivers because of:

- temporary changes to pedestrian and public transport access to, through and around the station
- temporary disruptions to local traffic movements near the station
- temporary loss of parking around the station in the adjacent commuter car park
- increased truck and vehicle movements due to the delivery of materials and equipment and the transportation of waste
- construction noise, vibration, dust and visual impacts.

Station access would be maintained at all times, except when construction work occurs during a rail shutdown. Rail shutdowns are standard practice for work in the rail corridor that cannot be undertaken while there are regular train movements. The rail shutdown would occur regardless of the Proposal being undertaken.

Temporary pedestrian diversions would be in place around the construction areas on Alexandria Parade for the pedestrian underpass construction, footpath upgrades and construction of the pedestrian crossing.

Customer parking at the station would be impacted during construction both within the commuter car park and along Alexandria Parade as discussed in Section 6.1.2.

Disruptions from rail shutdowns (e.g. requirement for replacement buses) would be as per normal Sydney Trains practice and would occur regardless of the Proposal. There may also be temporary minor disruptions to nearby on-street parking as a result of construction workers parking around the Proposal area.

In general, businesses in the area are unlikely to be adversely affected by the proposed work. There is potential for a minor temporary increase in retail and other purchases from construction workers during the work.

Operational phase

Operation of the Proposal would likely result in socio-economic benefits to the Waitara community and the wider Hornsby Shire LGA including:

- improved accessibility for customers at Waitara Station by providing two new lifts to access the station
- construction of a new pedestrian footpath and pedestrian crossing across Alexandria Parade improving safe access to the station
- reconfiguration of accessible parking in the commuter car park to provide access to the lift
- improved customer connectivity with provision of new accessible parking spaces on Alexandria Parade, relocated accessible parking spaces in the commuter car park closer to the northern station entrance and new kiss and ride bays in the commuter car park
- additional CCTV cameras contributing to positive CPTED outcomes for the station
- improved toilet facilities including the reconfiguration of existing male and female toilets to a family accessible toilet and a unisex ambulant toilet, with level access from the platform

- improved customer station facilities including new bike hoops
- potential economic improvements to surrounding businesses because of increased patronage to the station as a result of improved access.

6.6.3 Mitigation measures

A number of mitigation measures are recommended to minimise potential impacts on the community with a particular focus on keeping the community informed, 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
- development of a Community Liaison Management Plan (prior to construction), which would identify potential stakeholders and 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 where possible
- informing the community of construction progress, activities and impacts in accordance with the Community Liaison Management Plan
- providing contact details for a Project Infoline (24-hour construction response line) and email address to enable ongoing stakeholder contact throughout the construction phase.

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

6.7 Biodiversity

This section provides a summary of the potential biodiversity and tree impacts as a result of the Proposal and was informed by a site inspection at Waitara Station by an ecologist and arborist on 3 November 2021. The detailed methodology for the Arboricultural Impact Assessment is provided in the full report (Urban Tree Management, 2022).

6.7.1 Existing environment

Landscape context

Waitara Station is located within a highly modified and urbanised environment. The area is characterised by the rail line, the station platform, buildings, car parking, landscaping, pedestrian thoroughfares and operational railway areas. The station and its surrounds are not mapped as having any native vegetation cover under the *Vegetation Mapping of the Sydney Metropolitan Area* (VIS 4489). None of the vegetation present is considered to be remnant.

Database assessment

A search of the Atlas of NSW Wildlife (NSW BioNet) in February 2022 found previous records for 83 threatened species listed under the BC Act within a 10 square kilometre area centred on the station. This includes Grey-headed Flying Fox (nearest record 300 metres), Powerful Owl (nearest record 480 metres) and *Tetratheca glandulosa* (nearest record 425 metres).

A further search of the EPBC Act Protected Matters Search Tool in February 2022 indicated the potential presence of up to 51 threatened species and eight threatened ecological communities listed under the EPBC Act, within a five kilometres radius of the Proposal area.

Database searches are based on historic records and are an indication of the likely species present only. The likelihood that any historically recorded species or community is still present depends on several factors including the degree of clearing and development that has taken place since the record, as well as the present quality of habitat more generally. As such these searches should be viewed only as an indication of the species that may occur in the area.

No threatened species or ecological communities were recorded within the Proposal area during the field survey.

Site inspection

A site inspection was undertaken by Transport and AECOM on 3 November 2021.

Conditions during the survey were clear, around 20 degrees Celcius with no rain. There had been no rain in the preceding seven days.

The proposed work area was observed to have very little vegetation cover. The vegetation is generally limited to landscape plantings and naturally regenerated weeds within the station's gardens and surrounding rail corridor . The rail corridor also contains areas of managed vegetation, however this vegetation is located outside of the Proposal area.

The overall habitat value of the station area (for both flora and fauna) and rail corridor is considered to be low. This is based on the relative lack of any extensive vegetation cover, as well as the low overall diversity of this vegetation and its domination by exotic species. Despite the site's urban context, it is likely to be used by urban adapted native and exotic fauna.

Habitat for migratory birds was noted to be absent during the site inspection.

Flora

Vegetation observed within the landscaped areas of the station comprised a mix of native and exotic species including:

- *Lomandra longifolia*
- Camphor laurel (*Cinnamomum camphora*)
- Broad-leaf privet (*Ligustrum lucidum*)
- Sow thistle (*Sonchus sp*)
- Crofton weed (*Ageratina adenophora*)
- *Melaleuca linariifolia*.

Vegetation within the rail corridor, at the northern end of the station, adjacent to Alexandria Parade is heavily dominated by exotic species such as Broad-leaf Privet and Bamboo. One native canopy species is present – a single *Angophora costata* individual adjacent to the parallel car parking along the street.

There is one mature tree (Broad-leaf Privet) located adjacent to the proposed northern station entrance within private property. This large mature tree is about 12 metres tall with a canopy spread of 4.5 metres and is shown in Figure 6-12.

Figure 6-12 *Ligustrum lucidum* (Broad-leaf privet) located adjacent to the west of the proposed northern station entrance

Fauna

Targeted surveys for threatened or migratory fauna were not conducted during the site inspection, though incidental observations of fauna were noted. The Proposal area is highly disturbed and is subject to ongoing human activity including train and pedestrian movements throughout the day and night. As such the potential habitat value for threatened or migratory fauna is considered to be low.

There was no immediate evidence of use of the site by native mammals, though it is likely that some vegetation would provide habitat and foraging resources for certain native species such as possums and/or bats. This vegetation is also likely to provide occasional roosting and foraging opportunities for other species such as birds. The surrounding area would provide a minor degree of reptile habitat, particularly for snakes. Amphibian habitat is likely to be restricted to the most urban and disturbance adapted species only, such as striped marsh frog and common eastern froglet.

Fauna observed during the site inspection included:

- Noisy miner
- Sulphur-crested cockatoo.

6.7.2 Potential impacts

Construction phase

The Proposal would require the removal of nine trees comprising four species near the new northern entrance to the station to facilitate installation of the pedestrian underpass, new lifts and station entrance areas. These trees are within the rail corridor. Specifically, the following vegetation would be affected:

- Sweet Pittosporum *(Pittosporum undulatum)*
- Cinnamomum camphora *(Camphor Laurel)*

- Broad-leaf Privet *(Ligustrum lucidum)*
- Lombardy Poplar *(Populus nigra var. italica).*

Of the nine trees that would be removed, five trees are weed species and exempt from protection by the Hornsby Development Control Plan 2013.

The loss of vegetation around the northern station entrance is expected to be up to 80 square metres. This vegetation is comprised solely of common native landscaping species, as well as naturally generated urban exotics. The loss of this vegetation would not represent a significant impact in the context of the broader vegetation present in the area and is likely to be readily replaced through landscaping efforts associated with the Proposal. In accordance with Transport's *Vegetation Offset Guide* (2019m), a minimum of 44 trees would be planted to offset tree removal.

Despite the site's urban context, it is likely to be used by both native and exotic fauna. The degree of usage is likely to be low given the highly urbanised surrounding environment. Overall, the Proposal is considered unlikely to result in a significant impact on individual fauna species or the habitat of threatened or migratory fauna.

Works associated with the reconfiguration of the turning circle within the commuter car park would be located within the tree protection zone (TPZ) of a Broad-leaf privet shown in Figure 6-12. Efforts to minimise impacts to this tree would be applied through the design development and construction phases. This tree would be retained with the application of tree sensitive excavation and construction work in this location and would be protected during construction. The potential impacts above would be managed in accordance with the mitigation measures outlined in Section 7.2.

Construction of the Proposal has the potential to aid the spread of weeds into and out of the site during construction (both within the rail corridor and adjacent riparian areas). The degree of this impact would be readily managed via the application of suitable hygiene protocols outlined in Section 7.2 and is considered to be minor.

Operational phase

The operation of the Proposal would not result in any ongoing impacts to vegetation within or around the station.

Lighting at the station is proposed to be upgraded as part of the Proposal, however given the urbanised nature of the area, this is not expected to result in any substantial impacts upon native fauna.

The operation of the Proposal is intended to facilitate additional use of the station by a range of customers. Whilst this may result in a minor increase in the level of human activity, this is not expected to substantially adversely affect native fauna in the area.

6.7.3 Mitigation measures

The following mitigation measures are proposed to minimise the biodiversity impact of the Proposal including:

- in accordance with Transport's Vegetation Offset Guide (2019m), a minimum of 44 trees would be planted to offset tree removal
- disturbance of vegetation which would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the Arborist Assessment (Urban Tree Management, 2022) would be clearly demarcated onsite prior to construction. Trees to be retained would be protected through temporary protection measures discussed below
- Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Arborist Assessment (Urban Tree Management, 2022). Tree

protection would be undertaken in line with AS 4970-2009 Protection of Trees on Development Sites and would include exclusion fencing of TPZs

- non-destructive slit trenching along the edge of the footpath adjacent to the Broad-leaf privet (Tree 13) would be undertaken as supervised and monitored by an arborist in an effort to retain the tree.

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

The *1:100,000 Geological Map of Sydney* indicates that Waitara Station is underlain by Ashfield Shale of the Wianamatta group. The station and surrounding area is classified as part of the Hydrosols group, with the primary soils identified as yellow podzolic soils with regular occurrences of earthy sands and siliceous sands in the surrounding area.

A search of relevant datasets within the NSW Government Sharing and Enabling Environmental Data (SEED) portal was performed to establish the existing soil salinity level for the Proposal area. No salinity results were mapped within or near the Proposal area.

A review of the Atlas of Australian Acid Sulfate Soils (CSIRO, 2017) indicated that there is a low probability of occurrence of ASS within one kilometre of the Proposal area. ASS contain iron sulfides which when disturbed or exposed to air can release sulfuric acid. These soils are common along the coast of NSW and are also found inland around waterways, wetlands and drainage channels. The NSW Government Acid Sulfate Soils Risk Maps indicate that the area surrounding Waitara is classified as having no known occurrence of ASS.

The platform is elevated relative to the rail track bed and land surrounding the rail corridor. The topography of the site slopes down towards Alexandria Parade to the east of the station.

Contamination

The NSW EPA list of contaminated sites and record of notices in Waitara and surrounding suburbs indicates that there is are several recorded sites within proximity of the Proposal. These include::

- multiple petrol stations along the Pacific Highway (Caltex Star Mart Waitara at 59-61 Pacific Highway around 140 metres away and Coles Express and Shell at 194-206 Pacific Highway located about 500 metres away)
- industrial uses (Perini & Scott Pty Ltd at 126A Pacific Highway located about 180 metres from the Proposal)
- recycling facilities (CIC Master Pty Ltd at 1/26 Florence Street located about 680 metres from the Proposal)
- car dealerships (Hornsby Toyota at 42-54 Pacific Highway located about 240 metres away, Hornsby BMW at 56-62 Pacific Highway located about 180 metres away, Hornsby Mazda at 64-70 Pacific Highway located about 50 metres away, Volvo Cars Lindfield at 80-90 Pacific Highway located about 20 metres, Subaru Waitara at 47-53 Pacific Highway located about 120 metres away, and Mercedez Benz at 120-124 Pacific Highway located about 130 metres from the Proposal)
- car repair shops (Brydie Automotive and Muxlow Motors at 4 Romsey Street located about 40 metres away, Advance Tyres & More at 7 Romsey Street located about 100 metres away, and The Car Guys – Mechanic at 37 Alexandria Parade located about 50 metres away).

As the station precinct has operated since 1867, there is a risk of typical rail-related contaminants within the Proposal area relating to:

- fuel and oil spills, and engine emissions from historical rail activities
- pesticides and herbicides from weed and vegetation control
- potential asbestos containing materials within historical cabling and pipework ducting
- former site structures and brake linings
- various contaminants associated with the fabric of old rolling stock and structures and associated with imported fill and ballast.

AS 4482.1-2005 – *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds* lists chemicals used by specific industries, and includes chemicals commonly associated with railway yards which may be present at Waitara Station, including:

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

The Proposal would include modifications to the existing station building. Asbestos and lead paint have also been identified as likely in the kitchen area, Station Master's Office and male and female public toilet ceilings.

6.8.2 Potential impacts

Construction phase

The Proposal would require excavation work for the new pedestrian underpass as well as for installation of foundations and footings for new lift shafts and lifts, platform modifications and resurfacing. Other earthworks may be required for footpath work, relocation of services, drainage connection work and ground levelling work.

Soil disturbance, erosion and sedimentation

Excavation and other earthworks, if not adequately managed, could result in the following

Impacts:

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

Such impacts can potentially lead to adverse environmental impacts on biodiversity, for example through the introduction of sediment downstream into the nearby Waitara Creek, Cockle Creek and Jimmy Bancks Creek. These impacts would be minor given the scale of the work, limited amount of ground disturbance required, and the relatively flat surrounding topography and stability of the Proposal area.

As there is a low probability of ASS occurring in the Proposal area, there are not expected to be any impacts associated with ASS.

Contamination

Excavation and other earthworks have the potential to expose contaminants, which, if not appropriately managed, can present a health risk to construction workers and the community. Contaminants can also pose an environmental risk if they are released to soils or nearby waterways. As there is potential for existing soil contamination onsite, chemical testing and visual characterisation in accordance with the *Waste Classification Guideline* (EPA, 2014) would be undertaken to confirm the composition and nature of excavated material. Potential contamination at the Proposal area is unlikely to be at a level that would preclude the proposed work, especially as there is no change to the existing land use.

Excavation for the pedestrian underpass would require the removal of spoil offsite. Where spoil is classified as unsuitable for reuse, it would be transported to an appropriately licensed offsite facility.

Construction work to the station building also has the potential to disturb asbestos containing material and other hazardous substances (such as lead paint), posing a potential health risk to both construction workers and passengers. Potential contamination impacts may also arise from accidental spills of fuels, lubricants and chemicals used for construction plant and equipment. Accidental spills have potential to contaminate soils and waterways. The risk of impacts from contamination from construction activities would be low if the mitigation measures identified in Section 7.2 are implemented.

Operational phase

There would be no risks to geology, soils or contamination resulting from the operational phase of the Proposal.

6.8.3 Mitigation measures

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

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

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

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

6.9 Hydrology and water quality

6.9.1 Existing environment

Surface Water

The site is mostly impervious and the rail corridor and station area runoff generally discharges through local council-maintained infrastructure. Stormwater from the site would be expected to ultimately discharge into the three nearest waterways: Waitara Creek (750 metres west), Cockle Creek (one kilometre south) or Jimmy Bancks Creek (850 metres north).

Waitara Creek, the closest watercourse is a small creek which flows in a westerly direction where it joins Berowra Creek. The Proposal area is located within the Cowan Creek catchment area and is not located within a flood planning area due to the elevation and topography of the local area.

Flooding

The Proposal area is not mapped within Hornsby Shire Councils records as being flood prone.

A flood study was undertaken for a site adjacent to the west of Waitara Park which is around 230 metres east of the Proposal (GRC Hydro, 2019). This study concluded that the existing drainage infrastructure surrounding Waitara Park was undersized, resulting in frequent nuisance flooding across Edgeworth David Avenue to the east in events as minor as the 50% AEP storm event (1 in 2 year storm).

The topography generally slopes east with Waitara Station being around 15 metres higher in elevation than Waitara Park. It is therefore likely that during rainfall events, runoff discharges downhill and is unlikely to flood at or immediately surrounding the station.

Groundwater

The Australian Government Bureau of Meteorology Groundwater Explorer mapping system was used to identify all bores in the vicinity of the Proposal area. In total, two bores were identified over a kilometre south east of the station at depths of 216 metres and 162 metres. Given the location and depth of the bores, it is unlikely that any contamination associated with the station would impact the bores. Given the limited number of registered bores and the generally commercial/industrial nature of the land use directly surrounding the station, it is considered unlikely that the groundwater in the area would be used for any sensitive purposes such as a source for drinking water. There is a reticulated drinking supply in this area.

A report prepared by WSP in 2011 for a property located about 50 metres to the east of the site states that the soils in the area tend to form natural barriers of low permeability which would inhibit the migration of groundwater and any potential contaminants. The depth of groundwater encountered during this work was at nine metres with groundwater flow estimated as being in an easterly direction (WSP Environmental Pty Ltd, 2011).

A second report also produced by WSP in 2011 for a property located 15 metres to the west of the station platform found groundwater at a depth of eight metres with groundwater flow also estimated to be in an easterly direction (WSP Environmental Pty Ltd, 2011).

6.9.2 Potential impacts

Construction phase

The construction phase of the Proposal has the potential to impact on hydrology and water quality.

The Proposal has the potential to increase pollutant loads within local waterways through the release of sediment and debris from excavation during construction. This would be somewhat naturally mitigated by the substantial separation between the Proposal area and nearby waterways. Waitara Creek is the closest recognised waterway and is located 750 metres from the Proposal. Despite this it is recommended that suitable sediment control measures are implemented and maintained during construction. Should these be implemented, it is expected that the overall impact upon local waterways and their water quality would be negligible to minor. Excavations for the pedestrian underpass and to construct the lift shaft have the potential to result in the run-off of contaminated sediments into the nearby Waitara Creek, Cockle Creek and Jimmy Bancks Creek which may result in a decline of water quality and potential impacts to aquatic health.

Pollutants (fuel, chemicals or wastewater from accidental spills and sediment from excavations) could potentially reach Cowan Creek or Berowra Creek from the smaller

waterways mentioned above. Cowan Creek and Berowra Creek ultimately drain into the Hawkesbury River. 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.

It is estimated that the maximum depth of excavation required for the lift installations would be around seven metres deep, which is above the groundwater level identified in the reports for the sites near the station. As such, it is not expected that groundwater would be intercepted and the potential for impacting groundwater is low.

Direct impacts to the underground stormwater network may occur from construction activities. Appropriate controls would be detailed in the CEMP to ensure the drainage points are adequately protected during construction activities.

Operation phase

The Proposal does not change the elevation of the area in a way that would modify the current storage capacity and as such, it is unlikely that the Proposal would pose any risk of changing flood patterns.

New drainage outlets installed near the new lift areas would connect to existing stormwater pits. Runoff from the new pedestrian underpass and reconfigured pathways would continue to drain to the existing street stormwater system.

6.9.3 Mitigation measures

An Erosion and Sediment Control Plan would be prepared and implemented for the Proposal in accordance with the requirements of the Blue Book (Landcom, 2004) to manage risks to water quality. This would include specific controls to protect the stormwater network around Waitara Station.

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

6.10 Air quality

6.10.1 Existing environment

The existing air quality of the surrounding environment is considered to be characteristic of a suburban environment. Sensitive receivers in the vicinity of the Proposal include staff and customers at Waitara Station, residential properties along Alexandria Parade and Waitara Avenue and the commercial area of Waitara town centre.

A search of the National Pollutant Inventory undertaken on 17 February 2022 identified two air polluting sources within three kilometres of the Proposal. The closest source was identified as the Wrigley Company at Michigan Avenue, Asquith, about 2.8 kilometres east of the station however, given the distance it is unlikely this source would affect the Proposal area.

Other contributors to air quality within the local area would include emissions from motor vehicles on the surrounding road network, particularly from heavy vehicles along the Pacific Highway.

6.10.2 Potential impacts

Construction phase

Temporary air quality impacts that have the potential to occur during construction include minor increases in dust and emissions of carbon monoxide, sulfur 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 pedestrian underpass and lift shafts
- demolition work within the platform building including the lobby to the existing female toilets and toilet modifications
- movements in the construction compound area
- trenching and excavation for the footpath work and relocation of services
- loading and transfer of material from trucks, including spoil
- other general construction activities.

Standard management measures would be established to manage dust emissions from construction work.

The operation of plant, machinery and trucks would also contribute to exhaust emissions in the local area; however, these impacts would be short-term and minor due to the limited number of plant, machinery and vehicles required.

Operation phase

Overall impacts on air quality during operation would be negligible as the Proposal would not result in a change in land use or introduce activities that impact upon air quality. As the Proposal would increase access to public transport, the use of public transport would be expected to lead to a small reduction in private vehicle emissions in the long-term, which may contribute to an improvement in local air quality.

6.10.3 Mitigation measures

Mitigation measures to manage air quality include measures regarding maintenance and efficient operation of plant equipment and for dust suppression including watering, covering loads and appropriate management of any tracked dirt/mud on vehicles.

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

6.11 Resource efficiency and circular economy

6.11.1 Existing environment

Sydney Trains manages the day to day operations of Waitara Station. According to the Sydney Trains Annual Report 2017 – 2018, waste management is guided by the requirements of the Government Resource Efficiency Policy (GREP). Currently, waste is managed by the use of co-mingled recycling bins at the station, signs to assist customers with locations for waste receptacles and the purchasing of recycled or part-recycled products are placed where necessary. Additionally, resources are managed in accordance to the GREP, NSW Circular Economy Policy Statement and NSW Waste and Sustainable Materials Strategy 2041 where techniques have been implemented to reduce waste and increase resource efficiency.

6.11.2 Potential impacts

Construction phase

Construction of the Proposal would result in the generation of the following waste materials:

- excavated spoil
- asphalt and concrete
- surplus building materials and building waste (metal, timber, plastics, etc.)

- electrical wiring and conduit waste
- hazardous waste (chemicals and potentially asbestos)
- green waste
- general waste, including food scraps generated by construction workers.

As discussed in Section 6.8 excavation for the pedestrian underpass would require the removal of spoil offsite. Where spoil is classified as unsuitable for reuse, it would be transported to an appropriately licensed offsite facility.

Efforts to minimise the volume of surplus materials would be considered during planning and design of construction activities in accordance with the Resource Efficiency and Waste Management Plan (REWMP).

Operation phase

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

6.11.3 Mitigation measures

Waste management would be outlined in the CEMP and undertaken in accordance with the WARR Act. A REWMP would be prepared to identify potential waste streams associated with the Proposal and outline methods of disposal, reuse and recycling as well as other onsite waste management practices. The REWMP would include consideration of the Transport Sustainability Plan 2020-21 goal of to 'Develop a circular economy for Transport by designing waste and pollution out and keeping products and materials in use'. Any contaminated spoil unable to be reused onsite would be disposed of at an appropriately licensed facility.

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

Any concrete washout would be established and maintained in accordance with Transport's *Concrete Washout Guideline* (Transport for NSW, 2019d) with details included in the CEMP and location marked on an Environmental Controls Map (ECM).

Waste management targets in accordance with the ISC Infrastructure Sustainability Rating Tool v1.2 (2017) would be developed for the Proposal and would include reuse and recycling.

Mitigation measures to address waste generated during construction of the Proposal are identified in Section 7.2.

6.12 Sustainability

The design of the Proposal would be based on the principles of sustainability, including achieving a sustainability rating under the ISC Infrastructure Sustainability Rating Tool v1.2 and the Transport Environmental Management System (EMS). These guidelines require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.3 for more information regarding the application of these guidelines.

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

6.13 Climate change

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to the changes in climate and understand the limitation of adaptation. A climate change risk assessment pre-screening was undertaken for the Proposal with further consideration given as part of the *Waitara Preliminary Environmental Assessment* (Transport for NSW, 2018a). The

assessment identified the increased frequency of hot weather, increased temperatures and increased rainfall as the most material climate change impacts to the Proposal, requiring additional design considerations. Specific climate change risks identified included:

- an increase in heatwaves resulting in heat stress impacts to staff and passengers, leading to dehydration and/or illness resulting in possible hospitalisation and/or fatality
- increases in the number of hot days which is likely to increase heat stress and solar exposure to commuters using the existing and proposed pathways (including the new kiss and ride) from the eastern and western side of the rail corridor to the station platform
- increases in mean temperature and number of hot days resulting in the potential failure of lighting, CCTV, PA systems and other electrical components
- higher average temperatures and increased peak temperatures may put pressure on heating, ventilation and air conditioning (HVAC) systems within indoor spaces, such as the toilet facilities (including the longevity and function of these systems). This may increase maintenance and operational costs as well as reduce the capacity of these systems to adequately ventilate and cool facilities, leading to user discomfort
- an increase in the intensity of rainfall events, whereby the rainfall expected to occur in a 100-year average recurrence interval (ARI) flood event would occur more frequently potentially resulting in loss of access to the station by passengers (e.g. localised or flash flooding in the underpass or surrounding street network preventing passengers from accessing the station) or requiring customers to wait for a train service in an exposed area due to limited existing shelter
- an increase in frequency and severity in bushfires resulting in station damage or health / safety impacts to customers and staff (e.g. respiratory concerns) as well as affecting emergency response management. Air pollution from bushfires may reduce the patronage of the station and trigger smoke protection systems within the station. While the Proposal is not situated on land mapped as bush fire prone, areas of vegetation are adjacent to the station.

Furthermore, additional risks have been identified, including:

- indirect impacts to substations through extreme storm events disrupting power supply or extreme heat driving an increase in energy demand resulting in failures of the energy system which may lead to customers being trapped in lifts or loss of HVAC systems (particularly of concern on hot days)
- direct impacts to other station electrical systems due to bushfire or flooding impacting electrical systems such as lift operation or HVAC systems resulting in safety risks to customers. Electrical system failures could also result in train disruptions (e.g. signalling, service announcements, real-time monitoring)
- increases in the wind speeds and intensity (e.g. lightning and hail) associated with extreme storms such as East Coast Low storms resulting in damage to the station and/or safety concerns for customers and staff due to flying debris.

The detailed design would consider these impacts resulting from climate change on the Proposal through:

- detailed design would be developed in accordance with the Australian Rainfall and Runoff Guidelines, 2019 to ensure that the proposed infrastructure would not increase the potential flooding within the Proposal area
- detailed design would align with the Transport Sustainability Plan 2020-21 goal of ‘Consider climate risks in all decisions’

- as part of detailed design development, additional drainage features (e.g. larger pipes, additional pits, etc.) and raising critical infrastructure such as sub-stations and entries above flooding levels would be investigated
- materials would be selected for durability in extreme conditions including those projected to increase as a result of climate change (e.g. extreme heat and increased rainfall intensity) and those that minimise heat retention to help reduce potential health and safety impacts for customers and staff
- fire resistant/retarding materials would be incorporated wherever practicable to minimise risks of bushfire damage
- engineering and design features (e.g. higher wind-rated fasteners) would be incorporated to ensure structures such as lifts and canopies are constructed to minimise direct impacts from severe storms and strong winds
- sufficient protections such as insulation, glazing and cooling would be considered for electrical systems (e.g. lifts, sub-stations) to cater for future temperature increases
- the requirements/specification for any future HVAC systems to be installed in the upgraded toilet facilities would be considered to ensure they are sufficient to meet load requirements of future temperature increases
- further improvements to weather protection (from the underpass to station building) would be considered to shelter commuters from extreme heat and rainfall events.

Additional considerations to respond to climate change impacts during detailed design may include:

- back-up power supply (e.g. generators and/or solar panels) would be considered to provide continuity of electrical services (e.g. continuous operation of lifts or HVAC, or at minimum, allow lifts to return for access in the event of an outage)
- critical electrical equipment (such as the lift motor) would be located outside of potential low-lying areas that may be subject to flooding or provide flood barriers / other protection (e.g. dry proofing) to minimise risk of flooding
- standard vegetation clearance zones would be maintained to minimise vegetation debris and bushfire risk
- shelters or other shading for both the bike hoops and waiting areas for kiss and ride bays as well as the broader shaded connections from these other modes of transport to the station itself (e.g. additional trees, canopies or shade sails)
- consideration would be given to climate response in the development of the construction and operation management plans including:
    - including contingency (budget and schedule) in the work program to respond to extreme events, such as avoiding outdoor work during hotter periods (where practicable)
    - developing a high temperature stop work threshold
    - developing emergency procedures to respond to extreme events (e.g. extreme heat day, heavy rainfall event)
    - update of the evacuation and emergency management plan for the station based on the outcomes of the hydrology assessment.

These climate change adaptation measures would be further considered during detailed design and constructed where appropriate.

6.14 Emissions and embodied carbon

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. A consideration would be made to align the Proposal with the Transport Sustainability Plan 2020-21 goals of 'Reduce environmental impacts of projects and operations', 'Net zero emissions by 2050' and a subsequently agreed subsidiary target of Net Zero in Transport Operations by 2035.

The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport's *Carbon Estimate and Reporting Tool Manual* (Transport for NSW, 2019e) or other approved modelling tools. The carbon footprint would to be used to inform decision making in design and construction. Greenhouse gas emissions would also be assessed in accordance with ISC Infrastructure Sustainability Rating Tool v1.2.

Opportunities to reduce emissions, improve energy efficiency and reduce greenhouse gas emissions would include:

- implementing energy efficiency requirements for building and electrical equipment
- reduce construction related greenhouse gas emissions
- investigate and implement opportunities to use renewable energy or lower carbon energy during construction including use of certified Green Power
- investigate opportunities to reduce the life-cycle energy and carbon intensity of the project
- demonstrate that all mobile non-road diesel plant and equipment (with an engine power greater than 19kW) conforms with relevant United States Environmental Protection Agency, European Union or equivalent emissions standards including fitting of any exhaust after-treatment devices
- contractor vehicles, plant and equipment are selected for optimum energy efficiency, fitted with catalytic converters/diesel particulate filters or equivalent devices, and are well maintained and serviced in accordance with relevant equipment maintenance documentation to reduce emissions due to poor engine performance
- use of low volatile organic compounds paints, finishes, sealants, and adhesives and zero or low formaldehyde emission composite wood products (as defined in the Green Star Design and As Built Sydney Metro Rating Tool) for all buildings.

Sydney Trains and NSW TrainLink have entered into a long-term agreement to offset emissions associated with their electricity consumption. This means that all electricity used by these rail entities is now net zero emissions. This initiative contributes to Transport's overarching commitment to be net zero emissions in Transport Operations by 2035.

Due to the small scale of the Proposal and the short term temporary nature of the individual construction work, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Table 7-1.

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

6.15 Cumulative impacts

Cumulative impacts occur when two or more projects are carried out concurrently and in close proximity to one another. The impacts may be caused by both construction and operational activities and can result in a greater impact to the surrounding area than would be expected if each project was undertaken in isolation. Multiple projects undertaken at a similar time/similar location may also lead to construction fatigue, particularly around noise, traffic and air quality impacts, if not appropriately managed.

A search of the DPE Major Projects Register, Sydney and Regional Planning Portal, and Hornsby Shire Council Development Application Register on 18 February 2022 identified a number of proposed developments within around 200 metres of the Proposal area. A summary of the type of developments are provided in Table 6-21. All applications are for relatively minor construction work such as the construction of residential apartments.

Table 6-21 Proposed developments near the Proposal

Development proposals	Address	Status	Approximate distance from Proposal
Change of use from a vehicle sale premises to a specialised retail premise	80-96 Pacific Highway, Waitara	DA lodged	60 metres west
Alterations and additions to Magpies Waitara	11-37 Alexandria Parade, Waitara	DA lodged	50 metres east
Construction of a dwelling house	8 Yardley Avenue, Waitara	DA lodged	200 metres west
Change of use from an office to a beauty salon and construction of new shop front and greenhouse	12 Waitara Avenue, Waitara	DA lodged	100 metres west
Concept approval of a seniors housing development comprising self-contained dwellings and associated facilities to be constructed within a proposed building envelope as a staged development	18 Waitara Avenue Waitara	Under construction	145 metres east

During construction, the work would be coordinated with any other construction activities in the area, including the demolition of existing structures and construction of multi storey units in the surrounding suburbs. Consultation and liaison would occur with Hornsby Shire Council, TAHE/Sydney Trains, and any other developers identified, to minimise cumulative construction impacts such as traffic and noise.

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

Based on this assessment, it is anticipated that the cumulative impacts would be negligible, where consultation with relevant stakeholders and mitigation measures in Section 7.2 are implemented.

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

7 Environmental management

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

7.1 Environmental management plans

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

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

7.2 Mitigation measures

Mitigation measures for the Proposal are listed below in Table 7-1. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 7-1 Proposed mitigation measures

No.	Mitigation measure
	General
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of *Environmental Management Plan Guideline – Guideline for Infrastructure Projects,* (NSW Department of Planning, Industry and Environment, 2020) for approval by Transport, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the Contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An ECM would be developed by the Contractor in accordance with Transport 's *Guide to Environmental Controls Map* (Transport for NSW, 2019f) for approval by Transport , 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 Transport . 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) • consideration of opportunities to minimise the size of the construction area within the commuter car park whenever possible to minimise parking unavailability during construction • identification of options for offset parking to account for loss of commuter car parking spaces surrounding Waitara Station • 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 would 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 the kiss and ride bay, 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 • managing requirements around operating cranes in the airspace of adjacent properties (including any relevant permits or licences) • advising emergency services of all planned changes to traffic arrangements • scheduling / staging construction work to minimise temporary loss of interchange facilities and available parking. Consultation with the relevant roads' authorities would be undertaken during preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction.
9.	Opportunities for offset parking arrangements would be further investigated regarding the use of existing car parks in the vicinity of the station and nearby stations including the availability of the 321 Transport leased car parking spaces within Hornsby Westfield (L4) (available until 3 July 2022) and the Hornsby commuter car park of 143 car parking spaces on Jersey Street, Hornsby that has a project completion date of 25 August 2022. Outcomes of these investigations and proposed offset arrangements would be reported back to the Transport Senior Manager Environment and Sustainability. A memo from the Transport Senior Manager Environment and Sustainability to the Transport Project Manager and Construction Contractor endorsing the proposed arrangements must be provided prior to the occupation of existing car parking spaces.

No.	Mitigation measure
10.	Communication would be provided to the community and local residents to inform them of changes to parking, availability of offset parking opportunities/locations, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work.
11.	Road Occupancy Licences for temporary road closures would be obtained, where required.
12.	Pedestrian access would be maintained throughout construction to ensure that pedestrian connectivity is not impacted as a part of the work and that suitable and safe paths are provided.
13.	Qualified traffic controllers would be used when required during construction work to ensure safe and efficient movement of vehicle and pedestrian traffic on the external road as well as in and out of the construction site.
14.	Fencing and barriers would be installed between the construction site and outside the construction zone to ensure safe and easy navigation of pedestrians and cyclists.
15.	Opportunities to minimise impacts to parking and pedestrian movements through scheduling of construction activities would be investigated.
16.	To reduce impacts on cyclists, the construction work would be sequenced to prioritise early installation of bike hoops at the southern end of the station.
	Urban design, landscape and visual amenity

No.	Mitigation measure
17.	The following mitigation measures shall be implemented to reduce the visual impacts of the Proposal: An Urban Design Plan and Landscaping Plan is to be submitted to Transport and endorsed by the Precincts and Urban Design team. The Urban Design Plan is to address the fundamental design principles as outlined in 'Around the Tracks' – urban design for heavy and light rail, Transport, Interim 2016. The Urban Design Plan and Landscaping Plan shall: a. Demonstrate a robust understanding of the site through a comprehensive site analysis to inform the design direction, demonstrate connectivity with street networks, transport modes, active transport options, and pedestrian distances b. Identify opportunities and challenges c. Establish site specific principles to guide and test design options d. Demonstrate how the preferred design option responds to the design principles established in 'Around the Tracks', including consideration of Crime Prevention through Environmental Design Principles The Urban Design Plan and Landscaping Plan is to include the Public Domain Plan for the chosen option and will provide analysis of the: a. Landscape design approach including design of pedestrian and bicycle pathways, street furniture, interchange facilities, new planting and opportunities for public art b. Materials Schedule including materials and finishes for proposed built works, colour schemes, paving and lighting types for public domain, fencing and landscaping c. An Artist's Impression or Photomontage to communicate the proposed changes to the precinct The following design guidelines are available to assist and inform the Urban Design Plan and Landscaping Plan for the Proposal: a. TAP Urban Design Plan, Guidelines, TfNSW, Draft 2018 b. Commuter Car Parks, urban design guidelines, TfNSW, Interim 2017 c. Managing Heritage Issues in Rail Projects Guidelines, TfNSW, Interim 2016 d. Creativity Guidelines for Transport Systems, TfNSW, Interim 2016 e. Water Sensitive Urban Design Guidelines for TfNSW Projects, 2016 Endorsement of the Urban Design Plan and Landscaping Plan will demonstrate compliance with the Conditions of Approval in the Review of Environmental Factors (REF) Determination Report.
18.	Consider opportunities for the 44 replacement trees to be provided to offset tree removal to visually screen the proposal.

No.	Mitigation measure
19.	A Public Domain Plan (PDP) would be prepared by the Contractor, in consultation with Hornsby Shire Council, and submitted to Transport 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 Transport's ISC v1.2 • identification of design and landscaping aspects that will be open for stakeholder input, as required.
20.	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.*
21.	The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.
22.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
23.	Consideration of a finish to the proposed pedestrian underpass entrance on Alexandria Parade and retaining walls, including consideration of opportunities for a public artwork or Aboriginal heritage interpretation would be considered during detailed design.
24.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
25.	During construction, graffiti would be removed in accordance with Transport's Standard Requirements.
26.	Consider the use of brick elements within the design of the station landscaping, particularly new planted beds and retaining walls, to reference the existing brick used in landscape elements and assist in visually 'bedding down' new elements into the landscape.
27.	Consider retaining and reusing brickwork that is removed due to the Proposal.
28.	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.
29.	Finishes and materials for the station would be complementary to the existing locality and landscape and reflective surfaces would be minimised with a preferred use of muted colours.
30.	Limit disturbance of vegetation to the minimum amount necessary to construct the Proposal.

No.	Mitigation measure
31.	Implement measures to ensure no tracking of dirt and mud into public roads and other public spaces from construction activities and vehicle movements.
	Noise and vibration
32.	Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (Transport for NSW, 2019a) and the Noise and Vibration Impact Assessment for the Proposal (AECOM, 2022a). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
33.	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.
34.	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 work at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours work • use of quieter and less vibration emitting construction methods where feasible and reasonable.

No.	Mitigation measure
35.	The CNVMP should include, as a minimum, the following: • identification of nearby residences and other sensitive land uses • description of approved hours of work • description and identification of all construction activities, including work areas, equipment and duration • description of what work practices (generic and specific) would be applied to minimise noise and vibration • a complaints handling process • noise and vibration monitoring procedures, including for heritage structures • overview of community consultation required for identified high impact work.
36.	Work would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any work outside these hours may be undertaken if approved by Transport and the community is notified prior to this work commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the Transport Environment and Planning Manager for any work outside normal hours.
37.	As per the *Construction Noise and Vibration Strategy* (Transport for NSW, 2019a), construction activities with special audible characteristics (high noise impact, intensive vibration, impulsive or tonal noise emissions) would be limited to standard hours, starting no earlier than 8am; and to continuous blocks not exceeding three hours each with a minimum respite from those activities and work of not less than one hour between each block, unless otherwise approved by Transport .
38.	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.
39.	To avoid structural impacts as a result of vibration or direct contact with structures, the proposed work would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (AECOM, 2022a) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
40.	Vibration (other than from blasting) resulting from construction and received at any structure outside of the project would be managed in accordance with: • for structural damage vibration – British Standard BS 7385-2:1993 *Evaluation and measurement for vibration in buildings Part 2* and German Standard DIN 4150: Part 3 – 1999: *Structural Vibration in Buildings: Effects on Structures* • 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 6472-2:1992 *Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).*
	Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory work including jack hammering and compaction for all buildings/structures/roads with a plan distance of 50 metres from the work and all heritage listed buildings and other sensitive structures within 150 metres of the work (unless otherwise determined following additional assessment they are not likely to be adversely affected).
41.	**Aboriginal heritage**

No.	Mitigation measure
42.	All construction staff would undergo an induction in the recognition of Aboriginal 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.
43.	If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in Transport's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019g) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport Project Manager and Transport Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Heritage NSW and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and Heritage NSW notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to work recommencing at the location.
44.	**Non-Aboriginal heritage**
45.	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.
46.	In accordance with Section 170A of the Heritage Act, Sydney Trains should provide notification of the work to Heritage NSW at least 14 days prior to the commencement of the work.
47.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in Transport's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019g) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport Project Manager and the Transport Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and Heritage NSW. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to work recommencing at the location.
48.	A suitably qualified and experienced heritage specialist who is independent of the design and construction team's personnel would be engaged to provide ongoing heritage, design and conservation advice throughout detailed design and any subsequent relevant design modifications. The nominated heritage consultant would provide specialist advice throughout the detailed design phase to ensure that the final design adheres to the relevant strategies and the design recommendations in the SoHI (AECOM, 2022b).
49.	A specialist construction contractor experienced in working with heritage fabric would be engaged to undertake work associated with the widening of the toilet entrances during the construction stage of the Proposal.

No.	Mitigation measure

50.	The following aspects would be considered during detailed design development:
	• alternatives to the demolition of the wall separating rooms 1 and 2 should be explored. If no feasible alternatives can be found, it is recommended that the SSE in its current form is archivally recorded prior to any works taking place
	• care would be taken when undertaking all demolition work so as not to damage significant fabric. Demolition would be limited to brickwork that may be required to be removed to widen the entry door to both toilets
	• any new brickwork should match the original in terms of brick colour, mortar composition and brick orientation (bricks should be laid in the Flemish bond – alternating between header and stretcher alignment)
	• new services, including outlets, wall units and brackets should be located internally in areas already modified and/or consolidated in one location. Existing openings in ceilings are the preferred location for the installation of new services. New services and fittings should use existing fixing points or be located at mortar joints
	• impacts to the detailed architraves around the current toilet entry door and transom window should be minimised
	• new interior tiling should consider the Sydney Trains Draft – NSW Heritage Station Passenger Tile Finishes (2020)
	• in accordance with Strategy 10 of the Heritage Platforms Conservation Management Strategy (Australian Museum Consulting, 2015), the following principles should apply to the detailed design of the new lifts and stairs on the platform:
	  ○ upgrades should support their ongoing use without obscuring or damaging significant built heritage fabric or the integrity of the original designs
	  ○ the new lifts and stairs should not overwhelm the heritage fabric of the platform or associated features, either in scale, mass or colour, and should complement the character of the station precinct. They should also blend into the broader landscape setting of the station
	• where required, platform re-grading would not cover any existing wall vents that have been installed along the lower course of the brickwork to the station building. If cast iron gratings are removed, these should be stored for future reuse
	• the height of the eaves associated with the new boarding assistance zone canopy should be lower than the height of the eaves of the existing station building. The lower height of the introduced canopy would retain the physical dominance of the heritage station building.

51.	If required by the recommendations of the SoHI (AECOM, 20202b) heritage interpretation would be planned and integrated into the detailed design of the Proposal. The heritage interpretation planning would be prepared by the heritage consultant (and sub-consultants as required i.e. graphics) with reference to *Sydney Trains Heritage Interpretation Guidelines*. The heritage interpretation planning would be captured in a Heritage Interpretation Plan (HIP), which is to be issued as a progress report at each stage of detailed design.
52.	All ancillary work (CCTV, PA, communications, air-conditioning etc) would be undertaken in accordance with the relevant Sydney Trains heritage guidelines. Alternative solutions must be explored where any impacts to significant fabric are identified. Work would proceed with principle of avoiding fixing new services to the façade of the exterior building and would be contained/ concealed in new development areas. A complete services plan is to be reviewed and assessed by a qualified consultant with heritage experience identifying alternative solutions, and submitted to the ADEIA for endorsement prior to service relocation and ancillary work commencing.
53.	A section 140 permit under the *Heritage Act 1977* would be obtained from the NSW Heritage Council (or delegate) prior to the commencement of construction and the conditions of the approval must be implemented.

No.	Mitigation measure
54.	On completion of work, an update would be prepared for the Section 170 Heritage and Conservation Register, with required details.
	Socio-economic
55.	Sustainability criteria for the Proposal would be established to encourage the Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.
56.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
57.	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.
58.	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.
59.	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
60.	Construction of the Proposal must be undertaken in accordance with Transport's *Vegetation Management (Protection and Removal) Guideline* (Transport for NSW, 2019h) and Transport's *Fauna Management Guideline* (Transport for NSW, 2019i).
61.	In accordance with Transport's Vegetation Offset Guide (2019m), a minimum of 44 trees would be planted to offset tree removal.
62.	Non-destructive slit trenching along the edge of the footpath adjacent to the Broad-leaf privet (Tree 13) would be undertaken as supervised and monitored by an arborist in an effort to retain the tree.
63.	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.
64.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be trimmed in the Arborist Assessment (Urban Tree Management, 2022) would be clearly demarcated onsite prior to construction. Trees to be retained would be protected through temporary protection measures discussed below.
65.	Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Arborist Assessment (Urban Tree Management, 2022). Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs.
66.	In the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the Transport Project Manager and Transport Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.

No.	Mitigation measure
67.	Should the detailed design or onsite work determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete Transport's Tree Removal Application Form and submit it to Transport for approval.
68.	For new landscaping work, mulching and watering would be undertaken until plants are established.
69.	Weed control measures, consistent with Transport's *Weed Management and Disposal Guideline* (Transport for NSW, 2019j), 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 *Biosecurity Act 2015.*
	Soils and water
70.	Prior to commencement of work, 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 work and maintained throughout construction.
71.	Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the work is complete and areas are stabilised.
72.	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.
73.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and Transport's *Chemical Storage and Spill Response Guidelines* (Transport for NSW, 2019b).
74.	Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the Transport *Chemical Storage and Spill Response Guidelines* (Transport for NSW, 2019b) 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.
75.	In the event of a pollution incident, work would cease in the immediate vicinity and the Contractor would immediately notify the Transport Project Manager and Transport Environment and Planning Manager. The EPA would be notified by Transport if required, in accordance with Part 5.7 of the POEO Act.
76.	The existing drainage systems would remain operational throughout the construction phase.
77.	Should groundwater be encountered during excavation work, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and Transport's *Water Discharge and Reuse Guideline* (Transport for NSW, 2019c).
	Air quality

No.	Mitigation measure
78.	Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport's *Air Quality Management Guideline* (Transport for NSW, 2019k).
79.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
80.	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.
81.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
82.	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
83.	The CEMP (or separate Resource Efficiency and Waste Management Plan, if necessary) must address resource use and waste management, and would at a minimum: • identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data.
84.	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.
85.	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.
86.	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste* (EPA, 2014) prior to disposal.
87.	Any concrete washout would be established and maintained in accordance with Transport's *Concrete Washout Guideline* – draft (Transport for NSW, 2019d) with details included in the CEMP and location marked on the ECM.
	Sustainability, climate change and greenhouse gases
88.	Detailed design and construction of the Proposal is to be undertaken in accordance with the ISC Infrastructure Sustainability Rating Scheme (v1.2).

No.	Mitigation measure
89.	The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport's *Carbon Estimate and Reporting Tool Manual* (Transport for NSW, 2019e) or other approved modelling tools. The carbon footprint would to be used to inform decision making in design and construction.
90.	The detailed design process would undertake a climate change risk assessment.
	Cumulative impacts
91.	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:

- an additional station entrance at the northern end of Waitara Station that provides improved and equitable access for customers, including the installation of lifts, new stairs, relocated and additional accessible parking, upgraded accessible paths and BAZ and a new pedestrian crossing on Alexandria Parade
- improved station amenity and safety for customers at the station resulting from the installation of the family accessible toilet, unisex ambulant toilet, new lighting and CCTV
- improved accessibility for cyclists with the provision of new bike hoops
- retention of the existing station entrance and minimised impact to existing heritage fabric.

The likely key impacts of the Proposal are as follows:

- temporary changes to vehicle and pedestrian movements in and around the station during construction including temporary footpath diversions
- temporary changes to parking arrangements (including informal kiss and ride) around the station precinct during construction
- permanent loss of parking on Alexandria Parade for the new northern station entrance and pedestrian crossing
- permanent loss of parking in the Waitara Avenue commuter car park to new station entrance on the western side of the station
- visual changes due to the introduction of new elements into the existing environment including the new pedestrian underpass, two new lifts and associated canopies and changed parking conditions
- temporary noise and vibration impacts during construction
- impacts to the heritage character of the station through the installation of the new lifts and modifications to the station platform.

This REF has considered and assessed these impacts in accordance with section 171 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 detailed design of the Proposal would be carried out in accordance with the relevant requirements of the *Infrastructure Sustainability Rating Scheme -Version 1.2* (ISC, 2017) taking into account the principles of ESD (refer to Section 4.3). These would be considered during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to the maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

References

AECOM, 2022a, *Noise and Vibration Impact Assessment* - Waitara Station Upgrade, Sydney

AECOM, 2022b, *Statement of Heritage Impact* - Waitara Station Upgrade, Sydney

AECOM, 2022c, *Landscape Character and Visual Impact Assessment* - Waitara Station Upgrade, Sydney

AGIC, 2011, *Guidelines for Climate Change Adaptation,* Australian Green Infrastructure Council (now Infrastructure Sustainability Council), Sydney

Australian Museum Consulting, 2015, *Heritage Platforms Conservation Management Strategy*

Department of Environment and Climate Change, 2009*, Interim Construction Noise Guideline*, Sydney

Department of Environment and Conservation, 2006, *Assessing Vibration: A Technical Guideline*, Sydney

Department of Environment, Climate Change and Water, 2011*, NSW Road Noise Policy*, Sydney

Department of the Environment and Heritage, 2006, *Climate Change Impacts and Risk Management; A Guide for Business and Government,* Australian Greenhouse Office, Canberra

Department of Planning, Industry and Environment, 2020, *Environmental Management Plan Guideline – Guideline for Infrastructure Projects*, Sydney

Department of Planning and Environment, 2021, *NSW Waste and Sustainable Materials Strategy 2041,* Sydney

Department of Planning and Environment, 2014, *A Plan for Growing Sydney*, Sydney

EPA, 2014, *Waste Classification Guidelines*, Sydney

EPA, 2017, *Noise Policy for Industry,* Sydney

GRC Hydro, 2019, *Park Avenue, Waitara Redevelopment – Flood Assessment*

Greater Sydney Commission, 2018, *A Metropolis of Three Cities,* Sydney

Greater Sydney Commission, 2018a, *North District Plan,* Sydney

Greater Sydney Commission, 2018c, *Central City District Plan,* Sydney

Hornsby Shire Council, 2008, *Cycling Map,* Sydney

Hornsby Shire Council, 2020, *Hornsby Local Strategic Planning Statement*, Sydney

Hornsby Shire Council, 2020a, *Draft Walking and Cycling Strategy,* Sydney

Landscape Institute and Institute for Environmental Management (UK), 2013, *Guidelines for Landscape and Visual Impact Assessment*, Third Edition (2013)

Infrastructure NSW, 2018, *Building Momentum -State Infrastructure Strategy 2018-2038,* Sydney

Landcom, 2004, *Managing Urban Stormwater: Soils and Construction, Volume - 4th Edition*, Sydney

Ministry of Transport, 2008, *Guidelines for the Development of Public Transport Interchange Facilities*, Sydney

NSW Government, 2015, *State Priorities – NSW: Making It Happen*, Sydney

NSW Heritage Office & Department of Urban Affairs & Planning, (2002, *Statements of Heritage Impact* (Issue 2). Heritage Office & Department of Urban Affairs & Planning. https://www.environment.nsw.gov.au/Heritage/publications/index.htm#S-U

OEH, 2010, *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW South Wales,* Sydney

OEH, 2011, *Guidelines for Consultants Reporting on Contaminated Sites*, Sydney

OEH, 2016*, NSW Guide to Surveying Threatened Plants*

RailCorp, 2010, *Engineering Standard: Stations and Buildings – Station Design Standard Requirements: ESB 003 – Station Functional Spaces*

Stantec, 2019, *Scoping Design Report* – Waitara, Station, Sydney

Transport for NSW, 2016, *Vegetation Management (Protection and Removal) Guideline,* Sydney

Transport for NSW*,* 2018, *Guideline for Landscape Character and Visual Impact Assessment Practice Note,* Sydney

Transport for NSW, 2017, *Disability Action Plan 2018-2022*, Sydney

Transport for NSW, 2018a, Waitara Station Upgrade Preliminary Environmental Assessment, Sydney

Transport for NSW, 2018b, *Future Transport 2056*, Transport for NSW, Sydney

Transport for NSW, 2019a, *Construction Noise and Vibration Strategy*, Sydney

Transport for NSW, 2019b, *Chemical Storage and Spill Response Guidelines*, Sydney

Transport for NSW, 2019c, *Water Discharge and Reuse Guideline*, Sydney

Transport for NSW, 2019d, *Concrete Washout Guideline - draft*, Sydney

Transport for NSW, 2019e *Carbon Estimate and Reporting Tool Manual*, Sydney

Transport for NSW, 2019f, *Guide to Environmental Controls Map*, Sydney

Transport for NSW, 2019g, *Unexpected Heritage Finds Guideline*, Sydney

Transport for NSW, 2019h, *Vegetation Management (Protection and Removal) Guideline*, Sydney

Transport for NSW, 2019i, *Fauna Management Guideline*, Sydney

Transport for NSW, 2019j, *Weed Management and Disposal Guide*, Sydney

Transport for NSW, 2019k, *Air Quality Management Guideline*, Sydney

Transport for NSW, 2019l, *NSW Sustainable Design Guidelines - Version 4.0*, Sydney

Transport for NSW, 2019m, *Vegetation Offset Guide Version 2.1*, Sydney

Transport for NSW, 2020, *Transport Future Energy Strategy and Future Energy Action Plan,* Sydney

Transport for NSW, 2021, *Transport Sustainability Plan,* Sydney

Urban Tree Management, 2022, *Arboricultural development impact assessment report, Waitara Station NSW*

WSP Environmental Pty Ltd. (2011). *Detailed Site Investigation 4a Romsey Street, Waitara*, NSW. Sydney: WSP Environmental Pty Ltd

WSP Environmental Pty Ltd. (2011). *Detailed Site Investigation 64-72 Pacific Highway, Waitara*, NSW. Sydney: WSP Environmental Pty Ltd

Appendix A Consideration of matters of National Environmental Significance

The table below demonstrates Transport's consideration of the matters of national environmental significance (NES) under the EPBC Act to be considered in order to determine whether the Proposal should be referred to the Australian Department of Agriculture, Water and the Environment.

Matters of NES	Impacts
Any impact on a World Heritage property? There are no World Heritage properties in the vicinity of the Proposal.	Nil
Any impact on a National Heritage place? There are no National Heritage places in the vicinity of the Proposal.	Nil
Any impact on a wetland of international importance? There are no wetlands of international importance in the vicinity of the Proposal.	Nil
Any impact on a listed threatened species or communities? It is unlikely that the development of the Proposal would significantly affect any threatened species or communities.	Nil
Any impacts on listed migratory species? It is unlikely that the development of the Proposal would significantly affect any 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 does not involve development of coal seam gas or coal mining, nor is it likely to impact on water resources.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be undertaken on or near Commonwealth land	Nil

Appendix B Consideration of section 171 of the EP&A Regulation

The table below demonstrates Transport's consideration of the specific factors of section 171 of the EP&A Regulation 2021 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 resulting from increased traffic, noise and reduced visual amenity. Mitigation measures, as outlined in Section 7.2, would be implemented to manage and minimise adverse impacts.	Minor
(b) Any transformation of a locality? The Proposal would introduce new visible elements (a pedestrian underpass, pedestrian crossing and two lifts) into the existing landscape. These new elements however would be consistent with the existing use of the station and considered to be common features at railway stations. The Proposal would likely have a positive contribution to the locality as it would deliver an accessible path of travel to and from the station and facilitate better access to the station.	Minor
(c) Any environmental impact on the ecosystem of the locality? Environmental impacts are anticipated to be minor and temporary in nature and would not be expected to result in adverse impacts to the ecosystem of the locality.	Minor
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? The Proposal would result in a short-term reduction of the aesthetic of Waitara Station due to the presence of construction materials and equipment, and a longer-term impact to the heritage aesthetics of Waitara Station through the introduction of modern lifts and a new pedestrian underpass. This would be mitigated through the design of the lifts. Construction of the Proposal would also result in a reduction to environmental quality through noise and traffic impacts. Most of these impacts would be temporary in nature, and all are considered to be minor.	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 station has historic significance as the construction of the railway encouraged rapid subdivision and the development of the town in the late nineteenth century. The station remains as a model example of an early 20th century station design that has continued to evolve in line with changes in railway design and technology. Furthermore, the design of the station building makes a contribution to the overall character of the North Shore line, with its homogenous set of historic station buildings. The station building sits in an elevated position and is clearly visible from both sides of the line and is a well-known local landmark. However, the Proposal area at the station has been assessed as having low potential for significant archaeological remains. The configuration of the station and its key elements that contribute to the station's historical significance (station building and subway) would remain largely intact. The proposed work would have little or no impact to the historical significance of the station. The Proposal is likely to have a positive contribution to the locality by creating equitable access to the station.	Minor
(f) Any impact on the habitat of protected animals, within the meaning of *the Biodiversity Conservation Act 2016* The Proposal is unlikely to impact on the habitat of protected animals.	Nil

Factor	Impacts
(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 endanger any species of animal, plant or other form of life living on land, in water or in the air.	Nil
(h) Any long-term effects on the environment? The Proposal is unlikely to have any long-term effects on the environment.	Nil
(i) Any degradation of the quality of the environment? The Proposal is unlikely to result in the degradation of the quality of the environment. During construction there would be minor impacts to the environment, primarily from noise and dust emissions and reduction in visual amenity.	Nil
(j) Any risk to the safety of the environment? The Proposal could result in pollution or safety risks to the environment during construction. Provided the recommended management and mitigation measures are implemented, this risk is considered unlikely.	Nil
(k) Any reduction in the range of beneficial uses of the environment? The Proposal would not result in any reduction in the range of beneficial uses of the environment.	Nil
(l) Any pollution of the environment? Construction of the Proposal could result in pollution of the environment (e.g. noise and dust emissions), however provided the recommended management and mitigation measures are implemented, this risk is expected to be minor.	Minor
(m) Any environmental problems associated with the disposal of waste? The Proposal in unlikely to result in environmental problems associated with the disposal of waste. Hazardous waste (including asbestos, if found) may be generated by the Proposal. Contamination identification would occur prior to construction to confirm the presence of hazardous materials. All waste would be managed and disposed of with a site-specific REWMP prepared as part of the CEMP. 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 the demand on resources (natural or otherwise) that are, or are likely to become, in short supply.	Nil
(o) Any cumulative environmental effect with other existing or likely future activities? Cumulative environmental effects with other activities are discussed in Section 6.15. Based on the surrounding existing and proposed developments, cumulative effects are expected to be minor and be primarily related to traffic, noise and visual amenity.	Minor
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? As the Proposal is not located within a coastal area, it would not impact on coastal process and/or coastal hazards, including those under projected climate change conditions.	Nil
(q) Any applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1? All applicable local strategic planning statements, regional strategic plans or district strategic plans have been considered in Table 2-1.	Nil

Factor	Impacts
(r) Any other relevant environmental factors In considering the potential impacts of this proposal all relevant environmental factors have been considered, refer to Chapter 6 of this REF.	Nil