

Transport Access Program **Wollstonecraft Station Upgrade**

Review of Environmental Factors



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

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Abbreviations

Term	Meaning
AHIMS	Aboriginal Heritage Information Management System
ALR Act	<i>Aboriginal Land Rights Act 1983 (NSW)</i>
AS	Australian Standard
ASA	Asset Standards Authority (refer to Definitions)
ASS	Acid Sulfate Soils
BCA	Building Code of Australia
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
BS	British Standard
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CCTV	Closed Circuit Television
CLM Act	<i>Contaminated Land Management Act 1997 (NSW)</i>
CM Act	<i>Coastal Management Act 2016 (NSW)</i>
CNVMP	Construction Noise and Vibration Management Plan
D&C	Design & Construct
DBH	Diameter Breast Height
DDA	<i>Disability Discrimination Act 1992 (Cwlth)</i>
DoAWE	Department of Agriculture, Water and the Environment (Cwlth)
DPIE	NSW Department of Planning, Industry and Environment
DSAPT	<i>Disability Standards for Accessible Public Transport (2002)</i>
ECM	Environmental Controls Map
EES	NSW Environment, Energy and Science (Division of Department of Planning Industry and Environment) (formerly OEH)
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000 (NSW)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
FM Act	<i>Fisheries Management Act 1994 (NSW)</i>
Heritage Act	<i>Heritage Act 1977 (NSW)</i>
ICNG	<i>Interim Construction Noise Guideline</i> (Department of Environment and Climate Change, 2009)
Infrastructure SEPP	<i>State Environmental Planning Policy (Infrastructure) 2007 (NSW)</i>
IS rating	Infrastructure Sustainability rating under ISCA rating tool (v 1.2)
ISCA	Infrastructure Sustainability Council of Australia

Term	Meaning
LEP	Local Environmental Plan
LGA	Local Government Area
MCA	Multi-criteria analysis
NES	National Environmental Significance (refers to matters of National Environmental Significance under the EPBC Act)
NorBE	Neutral or Beneficial Effect
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
NSW	New South Wales
OEH	Formerly NSW Office of the Environment and Heritage
PDP	Public Domain Plan
PoEO Act	<i>Protection of the Environment Operations Act 1997 (NSW)</i>
REF	Review of Environmental Factors (this document)
Roads Act	<i>Roads Act 1993 (NSW)</i>
Roads and Maritime	(former) NSW Roads and Maritime Services
SEPP	State Environmental Planning Policy
SoHI	Statement of Heritage Impact
SHI	State Heritage Inventory
SHR	State Heritage Register
SREP	Sydney Regional Environmental Plan
SW Act	<i>Sydney Water Act 1994 (NSW)</i>
Transport for NSW	Transport for New South Wales
TPZ	Tree Protection Zone
UDP	Urban Design Plan
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001 (NSW)</i>
WM Act	<i>Water Management Act 2000 (NSW)</i>

Definitions

Term	Meaning
'A' Frequency weighting	Frequency weightings are used to adjust sound level meters so that they are measuring and reporting noise levels that represent what humans hear. The human ear is more sensitive to midrange frequencies between 500Hz and 6kHz (for example a child's scream) and less sensitive to very low or very high pitch noises. Sound level meters have inbuilt frequency weighting networks that very roughly approximate the human loudness response at low sound levels. It should be noted that the human loudness response is not the same as the human annoyance response to sound. Here low frequency sounds can be more annoying than midrange frequency sounds even at very low loudness levels. The 'A' weighting is the most commonly used frequency weighting for occupational and environmental noise assessments.
Asset Standards Authority	The ASA is an independent body within Transport for NSW, responsible for engineering governance, assurance of design safety, and ensuring the integrity of transport and infrastructure assets.
Average Recurrence Interval	The likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100-years.
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the Construction Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
Contractor	The entity appointed by Transport for NSW to undertake the construction of the Proposal. The Contractor is therefore responsible for all work on the project, both design and construction.
Detailed design	Detailed design broadly refers to the process that the Contractor undertakes (should the Proposal proceed) to refine the concept design 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 Division 5.1 of the EP&A Act).
Disability Standards for Accessible Public Transport	The Commonwealth <i>Disability Standards for Accessible Public Transport 2002</i> (as amended), authorised under the Commonwealth <i>Disability Discrimination Act 1992</i> (DDA) for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Ecologically Sustainable Development	As defined by clause 7(4) Schedule 2 of the EP&A Regulation. Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.
Interchange	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.
Noise catchment area (NCA)	Areas containing noise sensitive receivers that have been categorised based on a similar noise environment.

Term	Meaning
Noise management level (NML)	<p>An NML is a criteria for managing noise levels associated with an activity. They are site/project specific and are calculated based on the level of ambient noise (represented by the rating background level (RBL)) already at the site. An NML will consist of the RBL plus an allowable increase in noise emissions (e.g. RBL + 10dB). If noise emissions increase above the NML, sensitive receivers are likely to be disturbed.</p> <p>There are usually two types of NML, 'noise affected' and 'highly noise affected.' The noise affected level represents the point above which there may be some community reaction to noise. The highly noise affected level represents the point above which there may be strong community reaction to noise.</p>
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).
Out of hours works	Defined as works undertaken <i>outside</i> standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act.
Proposal	The construction and operation of Wollstonecraft Station.
Rail possession / shutdown	Shutdown is the term used by railway building/maintenance contractors to indicate that they have taken possession of the track (usually a section of track) for a specified period, where no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
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.
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.

Executive summary

Overview

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

The Proposal is 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 Proposal would aim to provide a station precinct that is accessible to those with a disability, limited mobility, parents/carers with prams, and customers with luggage.

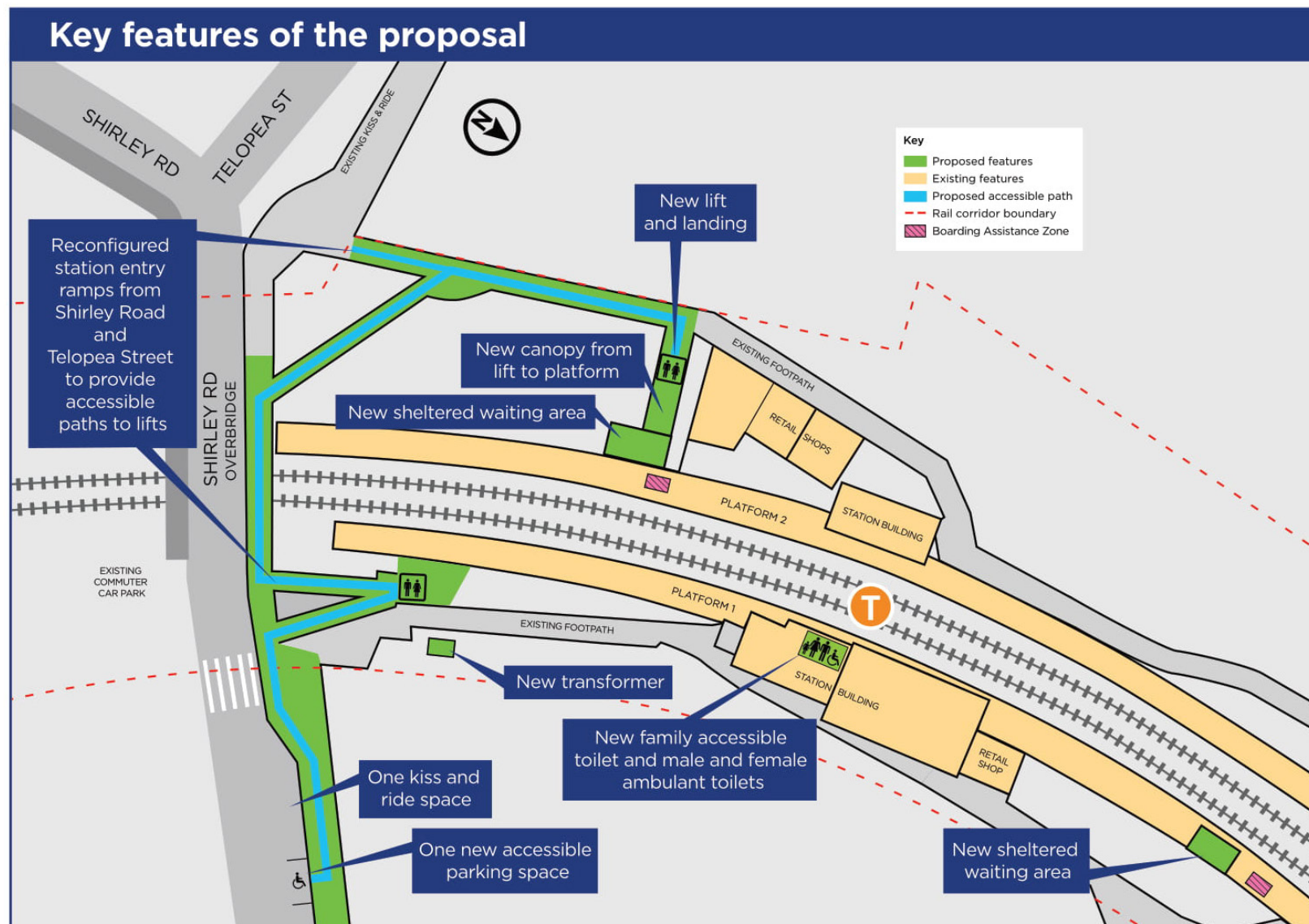
The Proposal would provide:

- two new lifts connecting to Platform 1 and 2
- reconfiguration of the station building to accommodate one unisex family accessible toilet, two unisex ambulant toilets, maintaining cleaners' room and construction of new Main Switch Room
- modification of the waiting area on both platforms for accessible entry and level access
- construction of a new canopy at the boarding assistance zones on Platform 1 and 2
- raising, stabilisation and regrading of station platforms for to comply with the requirements of the *Disability Standards for Accessible Public Transport 2002* (DSAPT)
- modification of the Shirley Road Overbridge by widening and re-grading the northern footpath along with new compliant handrails and accessible entry points
- one new kiss and ride bay and one DSAPT compliant car parking space on Shirley Road.

The removal of existing billboard advertisements to accommodate the new pedestrian ramp connecting to the Shirley Road Overbridge would be part of an early works program and assessed under a separate exemption that is not included in this Review of Environmental Factors (REF).

This 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 Q3 2020 and take around 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.



Indicative layout of Wollstonecraft Station Upgrade (subject to detailed design)

Figure ES-1 Key features of the Proposal

Need for the Proposal

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

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

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

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 for NSW understand what is important to customers and the community. The REF would be displayed for a period of two weeks. Further information about these specific consultation activities is included in Section 5.3 of this REF.

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

In accordance with the requirements of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP), consultation is required with local councils and/or public authorities in certain circumstances, including where council managed infrastructure is affected. Consultation has been undertaken with North Sydney Council and local community stakeholders during the development of design options and the preferred option. Consultation with North Sydney Council occurred on 16 December 2019. Consultation with these stakeholders will continue through the detailed design and construction of the Proposal.

Feedback can be sent to:

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

Or submitted:

- via <http://www.nsw.gov.au/wollstonecraft-station-upgrade>

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

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

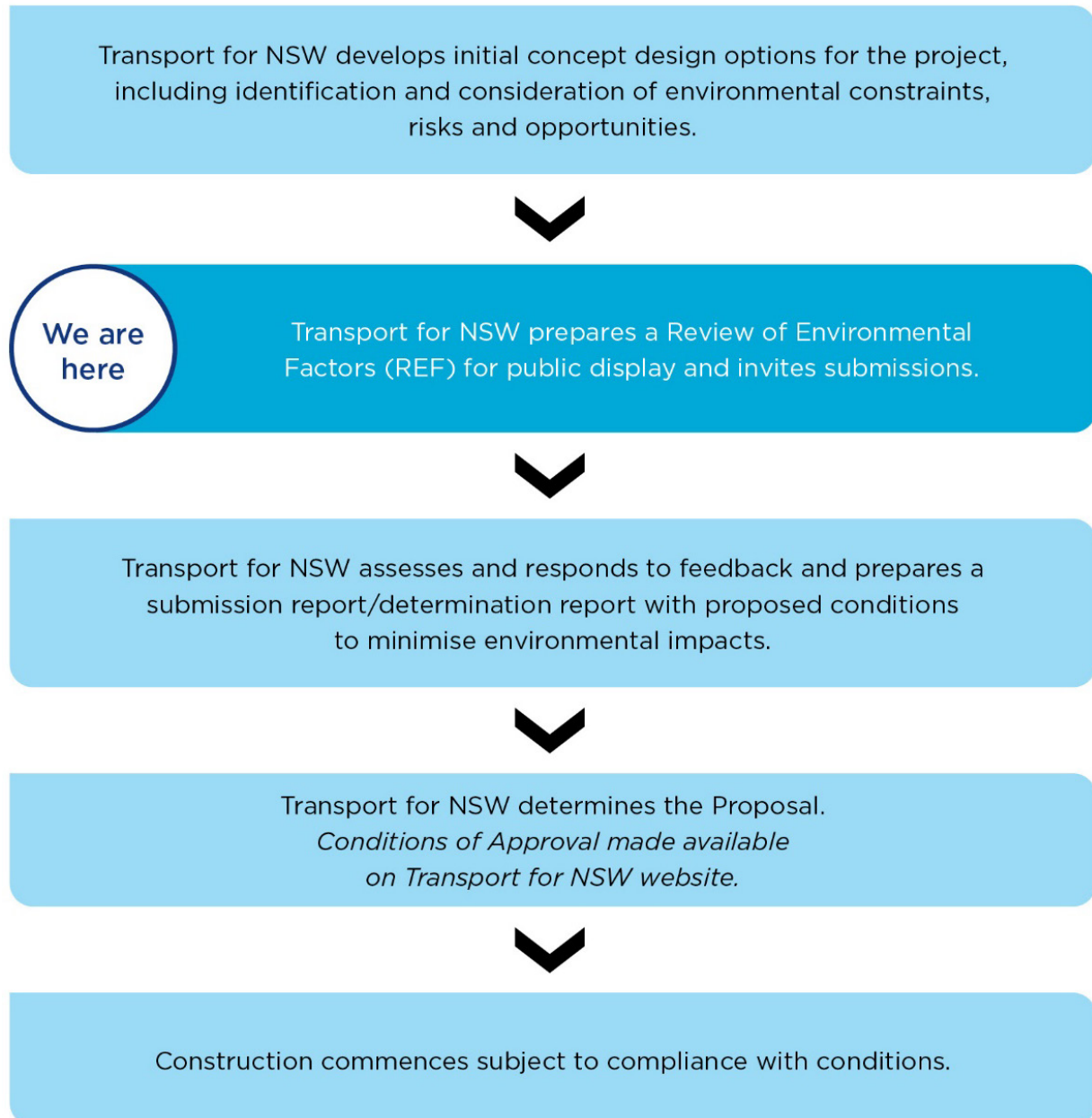


Figure ES.2 Planning approval and consultation process for the Proposal

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:

- a station that provides improved accessibility to people with a disability, limited mobility, parents/carers with prams and customers with luggage
- upgrading accessibility of the existing station through modern, secure and integrated transport infrastructure to meet the needs of a growing population

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

- increased traffic and parking demand due to impacts during rail possession periods from full closure of the commuter car park and one-lane closure of Shirley Road
- moderate adverse visual impacts from vegetation and tree removal to accommodate new lifts and placement of an AusGrid electrical transformer
- noise exceedances are expected during all construction scenarios for standard-hours day period and predicted sleep disturbance; however, would be intermittent and temporary
- minor impacts to adjacent Wollstonecraft Conservation Area due to removed vegetation and introduction of new lifts and station infrastructure impacting the heritage fabric and values of the station
- temporary and minor disruptions for the community and commuters to access the station during construction and rail possession periods.

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 to 5.7 of the EP&A Act and clause 228 of the EP&A Regulation, to ensure that Transport for NSW takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The detailed design of the Proposal would also be designed in accordance with the Infrastructure Sustainability Council of Australia (ISCA) rating tool v1.2 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 outlined in this REF, the Proposal is unlikely to significantly affect the environment including critical habitat or threatened species, populations, ecological communities or their habitats.



Figure ES.3 Photomontage of the Proposal (indicative only, subject to detailed design)

1. Introduction

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

Transport for New South Wales (Transport for NSW) was established in 2011 as the lead agency for integrated delivery of public transport services across all modes of transport in NSW. Transport for NSW is the proponent for the Wollstonecraft Station Upgrade (the 'Proposal').

1.1. Overview of the Proposal

1.1.1. Need for the Proposal

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

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

Wollstonecraft Station has been identified for an accessibility upgrade as it does not currently meet key requirements of the Commonwealth *Disability Discrimination Act 1992* (DDA) and associated requirements of the *Disability Standards for Accessible Public Transport 2002* (DSAPT).

Non-DSAPT compliant access points and paths to Wollstonecraft Station platforms do not currently facilitate equal access for people with reduced mobility, a disability, parents/carers with prams, or customers with luggage.

The Proposal would provide safe and equitable access to the platforms and to the pedestrian network surrounding the station. Customer facilities and amenities would also be improved including accessible toilet facilities and platforms. The upgrades would provide an improved customer experience for existing and future users of the station.

Potential future increases in patronage also have been taken into consideration during the design development.

1.1.2. Key features

The key features of the Proposal are shown in Figure 1-1 and summarised as follows:

- construction of a new lift connecting the Shirley Road entry to Platform 1
- construction of a new lift connecting Telopea Road and Shirley Road overbridge to Platform 2
- station building and platform works including:
 - reconfiguration of Platform 1 existing station building and toilets to accommodate one unisex family accessible toilet, two unisex ambulant toilets and maintaining the cleaners' room on Platform 1
 - construction of a new Mains Switch Room at the southern end of the Platform 1 station building
 - modifications to the waiting area on Platform 1 to provide level access entry to the station platform

- modification of the waiting area on Platform 2 to provide accessible entry
- construction of a new canopy at boarding assistance zones on Platform 1 and 2
- raising and regrading of station platforms to form a compliant pathway and reduce height access to trains.
- modification of the Shirley Road and overbridge including:
 - widening and regrading of the northern footpath on the Shirley Road Overbridge
 - reconfiguration of the existing overbridge traffic lanes and medians
 - accessibility installations including new compliant handrails and overbridge approaches with ramps and stairs at each end to access new lifts to the platforms
- one new kiss and ride bay and one DSAPT compliant car parking space on Shirley Road.

Subject to planning approval, construction is expected to commence in Q3 2020 and take around 18 months to complete.

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

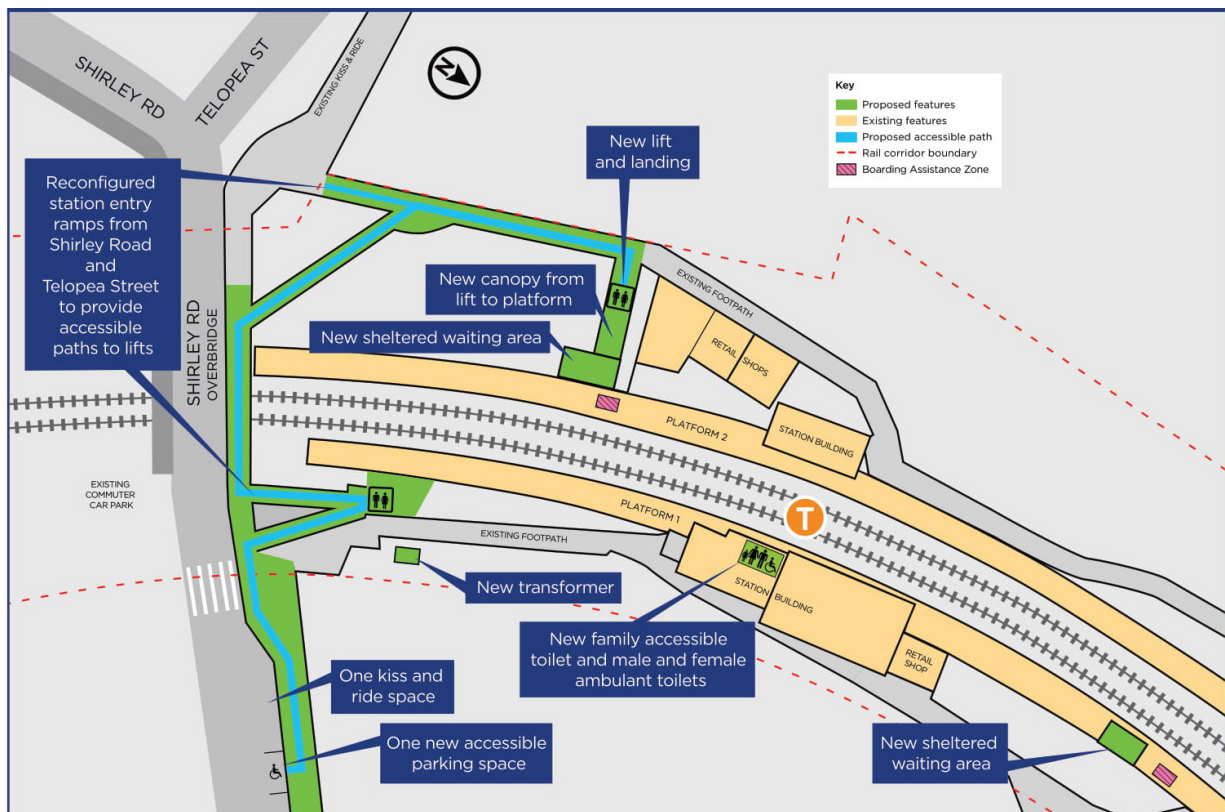


Figure 1-1 Key features of the Proposal

1.2. Location of the Proposal

The Proposal is located in the suburb of Wollstonecraft in the North Sydney Council local government area (LGA) located approximately four kilometres north from Central Station. Figure 1-2 shows the station's regional location.

The Proposal is generally within a medium to high density residential neighbourhood bounded by local roads on the south including Shirley Road, Telopea Street and Belmont Avenue.

Wollstonecraft Station is serviced by two lines for intercity and regional connections including North Shore and Western Line (T1), Northern Line (T9) and Central Coast and Newcastle (CCN). Platform 1 provides train services southbound towards Central Station. Platform 2 provides train services northbound to Gordon and Greater Newcastle region.

The Proposal would be located within the boundaries of the existing station as well as including the Shirley Road Overbridge located on the southern side of the station.

Existing ownership of Wollstonecraft Station infrastructure includes the following:

- the station, rail infrastructure and operations by RailCorp (i.e. Sydney Trains)
- the commuter car park is located on RailCorp land
- DSAPT compliant car parking and kiss and ride bay are located on North Sydney Council land.

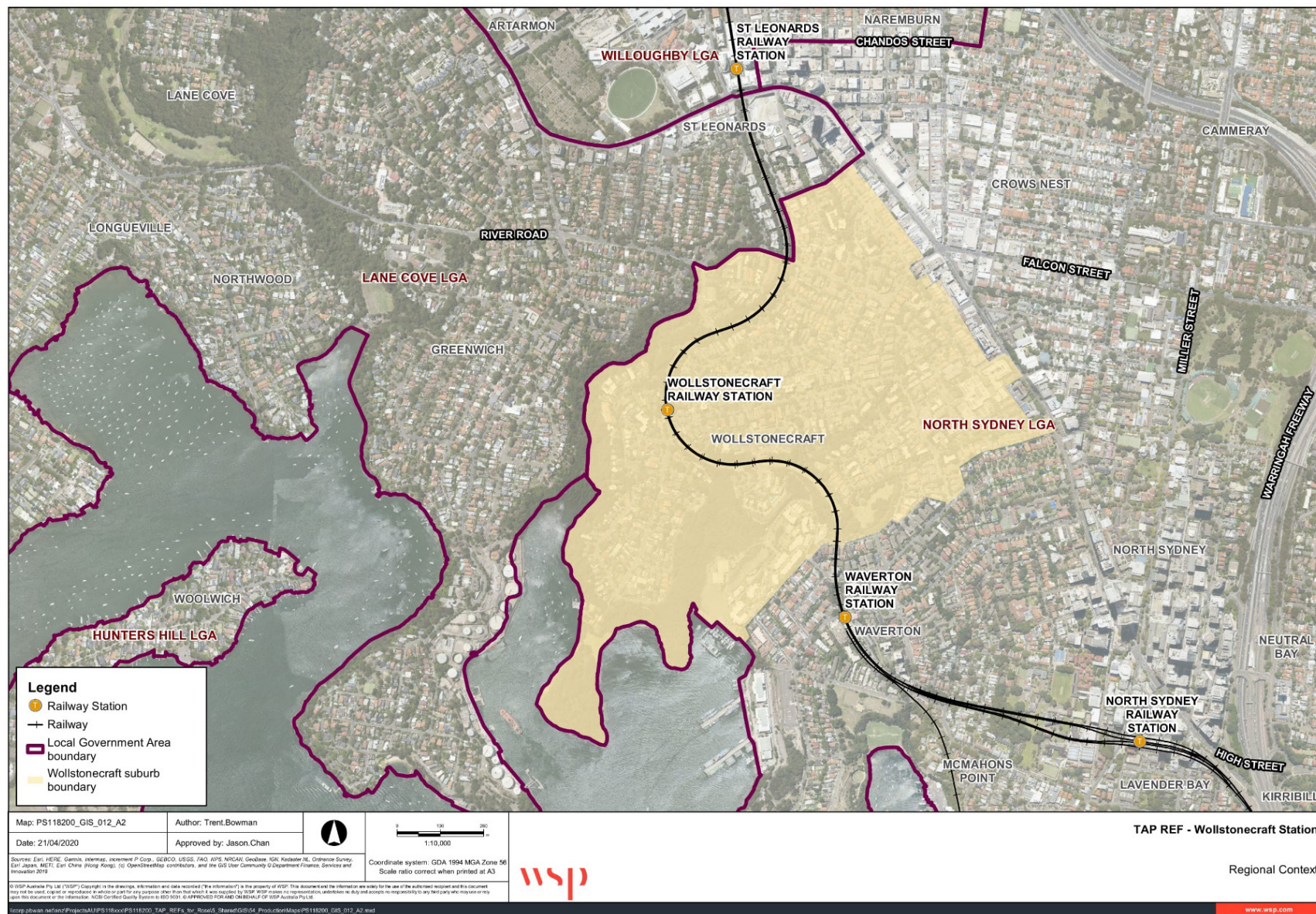


Figure 1-2 Regional context

1.3. Existing infrastructure and land uses

1.3.1. Station access and facilities

Wollstonecraft Station consists of two platforms located on the east (Platform 1) and west (Platform 2) which are accessed via a footpath from the Shirley Road Overbridge and adjacent footpath. Access to the footpath of Shirley Road Overbridge is only available from Shirley Road at the intersections of Telopea Street and Belmont Avenue respectively.

Platform 1 includes a station building with a staffed office, covered waiting area, one retail shop and male and female toilets. There is a retail shop adjoining the station building; however, there is no access to the retail shop from the platform and entry is only from the pathway behind the station. Access to Platform 1 is via Shirley Road.

Platform 2 includes a waiting area with seating, storage room for station utilities and services. Three retail shops are located adjacent and behind the waiting area with the nearest entry via a pathway from Telopea Street.

Opal card readers and timetable display monitors are also located on both platforms.

1.3.2. Interchange facilities

There is a commuter car park on North Sydney Council land located directly adjacent to Wollstonecraft Station with access along Shirley Road. There are 36 commuter car parking spaces with no identified accessible parking spaces. There is a kiss and ride bay located on the south side of the station near the intersection of Shirley Road Overbridge and Telopea Street.

The closest bus stop is about 100 metres away from Wollstonecraft Station on Milner Crescent. This stop operates route 265 travelling to and from North Sydney to Lane Cove (via Greenwich).

Site location of the Wollstonecraft Station is shown in Figure 1-3. Photos of the existing station are shown in Figure 1-4 to Figure 1-9.



Figure 1-4 Rock formation along Platform 1



Figure 1-5 View of Shirley Road Overbridge



Figure 1-6 Pedestrian pathway to Platform 1



Figure 1-7 Shirley Road Overbridge



Figure 1-8 Pedestrian pathway to retail shops and Platform 2



Figure 1-9 Rail corridor, looking towards the City

1.4. Purpose of this Review of Environmental Factors

This REF has been prepared by Transport for NSW to assess the potential impacts of the Wollstonecraft Station Upgrade. For the purposes of these works, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this REF is to describe the Proposal, to assess the likely impacts of the Proposal having regard to the provisions of Section 5.5 of the EP&A Act, and to identify mitigation measures to reduce the likely impacts of the Proposal. This REF has been prepared in accordance with clause 228 of the *Environment Planning and Assessment Regulation 2000* (EP&A Regulation).

This assessment has also considered the relevant provisions of other relevant environmental legislation, including the *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act) and the *Roads Act 1993* (Roads Act).

Having regard to the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), this REF considers the potential for the Proposal to have a significant impact on matters of National Environmental Significance (NES) or Commonwealth land, and the need to make a referral to the Commonwealth Department of 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 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 Wollstonecraft 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 transport modes, encourage greater public transport use and better integrate station interchanges with the role and function of town centres and developing urban centres in regional areas of NSW. Table 2-1 identifies key NSW government policies applicable to the Proposal as part of the strategic justification. Further details of the statutory considerations Commonwealth and NSW Government legislation are discussed in Chapter 4 of this REF.

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

Policy / Strategy	Overview	How the Proposal aligns
<i>Future Transport Strategy 2056</i> (TfNSW, 2018)	<i>Future Transport 2056</i> is an update of NSW's <i>Long Term Transport Master Plan</i> . It is a suite of strategies and plans for transport to provide an integrated vision for the state. <i>Future Transport 2056</i> identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport.	The Proposal supports the vision of the <i>Future Transport Strategy 2056</i> by providing accessible services for people who currently find it difficult to access public transport services. New lifts, a new ramp and accessible paths included in the Proposal would allow people with mobility constraints to access public transport. Greater accessibility would also mean better connections to places and opportunities for employment, education, business and leisure. The Proposal has also considered increased patronage in design development to accommodate the forecast Sydney Trains patronage growth, changing travel patterns and sustainability targets.
<i>Disability Inclusion Action Plan 2018 – 2022</i> (TfNSW, 2017)	The <i>Disability Inclusion Action Plan 2018-2022</i> was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing organisations within NSW. The Disability Plan discusses the challenges, the achievements to date, the considerable undertaking that is required to finish the job, and provides a solid and practical foundation for future progress over the next five years.	The Proposal has been developed 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
NSW State Infrastructure Strategy 2018-2038 (NSW Government, 2018)	<p>The NSW State Infrastructure Strategy 2018–2038 builds on the NSW Government’s major long-term infrastructure plans over the last seven years.</p> <p>The strategy sets out the government’s priorities for the next 20 years, and combined with the Future Transport Strategy 2056, the Greater Sydney Region Plan and the Regional Development Framework, brings together infrastructure investment and land-use planning for our cities and regions.</p> <p>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.</p>	<p>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.</p> <p>The Proposal is also consistent with overall aims and objectives of the <i>Future Transport Strategy 2056</i> to improve transport infrastructure across NSW as described above.</p>
NSW: Premier Priorities (NSW Government, 2019)	<p>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:</p> <ul style="list-style-type: none"> • 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 	<p>The Proposal aligns with these objectives as the upgrade would provide increased access to the community and provide improved connected communities and support the disadvantaged.</p>
A Metropolis of Three Cities - Greater Sydney Region Plan (Greater Sydney Commission, 2018a)	<p>The <i>Greater Sydney Region Plan</i> 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.</p>	<p>The Proposal particularly supports Objective 7 of the Three Cities Plan which is to ensure ‘services and infrastructure meet communities’ changing needs’, as it would increase the accessibility of places and transport for all people that use Wollstonecraft Station.</p>
North District Plan (Greater Sydney Commission, 2018b)	<p>The <i>North District Plan</i> 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 helps guide the implementation of Greater Sydney Region Plan, A Metropolis of Three Cities, at a district level and is a bridge between regional and local planning.</p>	<p>The Proposal is located within the North District.</p> <p>The Proposal would assist in meeting the Planning Priorities of providing services and social infrastructure to meet people’s changing needs as it would increase the accessibility of places and transport, ensuring people with disability can easily access services. As well as aligning with enhanced productivity as a well-connected city as the Proposal develops a more accessible and walkable city.</p>

Policy / Strategy	Overview	How the Proposal aligns
Disability Inclusion Action Plan 2016-2019 (North Sydney Council, 2016)	<p>The <i>Disability Inclusion Action Plan 2016 – 2019</i> identifies actions to ensure Council's services, facilities, programs and information are inclusive for all members of the community. Key areas of the Plan are:</p> <ul style="list-style-type: none"> • Liveable Communities • Employment • Systems and Processes • Attitude and Behaviours. 	The Proposal would assist in achieving the aims of the Disability Inclusion Action Plan, as it would make paths and open spaces barrier free and more accessible to people with disability around Wollstonecraft 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 people with disabilities, limited mobility, parents/carers with prams, and customers with luggage
- modern buildings and facilities for all transport modes that meet the needs of a growing population
- modern interchanges that support an integrated network and allow seamless transfers between all transport modes for all customers
- safety improvements including extra lighting, help points, lift alarm, fences and security measures for car parks and interchanges, including stations, bus stops and wharves
- signage improvements so customers can 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 Wollstonecraft Station Upgrade are to:

- provide a station that is accessible to customers with a disability, limited mobility, parents or carers with prams and customers with luggage
- improve customer experience by improving accessibility for people with mobility issues (including improved access to station facilities such as the toilets, waiting room and accessible parking spaces)
- improve pedestrian connectivity between commuter car park and station
- improve customer safety
- improve wayfinding in and around the station
- respond to the heritage values of the site with preservation of the station sign.

2.3.1. Design development

The need for an upgrade was identified in a Scoping Design Report as the station does not currently meet the DDA or requirements of DSAPT (SMEC, 2018). The report identified the following key access constraints and issues at Wollstonecraft Station:

- grade of Shirley Road Overbridge exceeds 1:20 with connected footpath grading exceeding 1:40
- station entrances not currently accessible from either side of the station due to the steepness of the walkways leading to and from the underpass
- no access to kiss and ride bay and DSAPT compliant car parking
- no accessible path between Platform 1 and 2 due to the steepness of the pathways from Milner Crescent, Milray Avenue and Shirley Road
- no availability of lifts to connect from local street and footpaths to the platforms
- platform pathways and heights require improvement for improved accessibility.

2.4. Options considered

To achieve the desired project outcomes, three main design options were considered to upgrade Wollstonecraft Station. These options considered a number of upgrade elements including various lift configurations and other minor station precinct upgrades.

A 'do nothing' option was also considered for comparative purposes to the proposed option.

2.4.1. The 'do-nothing' option

Under a 'do-nothing' option, existing access to the platforms, overbridge and station building would remain the same and there would be no changes to the way the station currently operates. This option would not address or satisfy objectives of the Transport Access Program.

2.4.2. Option 1 – New footbridge

This option includes the provision of a new footbridge located toward the south of the station with associated stairs and elevated ramps. This option would also include provisions of two new lifts from the existing platforms to the new footbridge.

This option would include an upgrade of the platform to be re-graded to DSAPT compliance. The platforms would also include improved connectivity from the footpaths including the following:

- wheelchair waiting space and canopy for Platform 1 and 2
- accessible seating for Platform 1 and 2
- lowered floor to existing waiting area on Platform 2.

This option would also include additional upgrades including the following:

- conversion of the existing toilets to include a family accessible toilet and two ambulant toilets
- accessible path to retail shops with new ramps to Platform 2
- accessible car parking space on Shirley Road
- formalised kiss and ride bay on Shirley Road
- minor works include enhanced lighting, CCTV and new DB Room and cleaners room
- platform stabilisation and regrading and Tactile Ground Surface Indicators (TGSIs) to platform edge.

2.4.3. Option 2 – Externally widen existing overbridge footpath

In lieu of the new footbridge in Option 1, this option would widen the existing overbridge footpath to the north (into the rail corridor) and the regrading of the footpath to provide connectivity and access. This option would include the removal of billboard signs on Platform 2 to accommodate the proposed widening. Two new lifts from the existing platforms would be provided with elevated lift landings to connect the footpath to the platforms.

Platform regrading, seating upgrades, toilet facilities, car parking, kiss and ride bay and minor works would also be provided, similar to Option 1.

2.4.4. Option 3 – Internally widen existing overbridge footpath (into carriageway)

In lieu of the new footbridge in Option 1, this option widens the existing overbridge footpath into the road carriageway on the north side only requiring the existing traffic lanes to be reconfigured. This option would include the following to the east and west side of Shirley Road Overbridge:

- the construction of a new accessible ramp paths to new lifts to access each platform
- regrading of the overbridge footpath and approach footpaths and repositioning of billboards on Platform 2
- installation of two new lifts to connect the footpaths to the platforms with elevated lift landings.

Platform regrading, seating upgrades, toilet facilities, car parking, kiss and ride bay and minor works would also be provided, similar to Option 1.

2.4.5. Option 4 – Stair access to Platform 2 along retail shops

An option was also investigated for a compliant path to access Platform 2 and the retail shops from the proposed lift location. The investigation determined a series of stairs and ramps with landings would be required to achieve compliance with DDA and DSAPT. In this option, a compliant accessible path would be provided between the proposed new lift and main entry to platform 2 as shown in Figure 2-1.



Figure 2-1 Option 4 design of stair access to Platform 2 along retail shops

2.4.6. Assessment of identified options

Each of the options were quantitatively and qualitatively assessed using Transport for NSW's Multi-Criteria Assessment (MCA) framework by Transport for NSW representatives and other key stakeholders. The assessment included consideration of factors such as building and design, engineering, environment, traffic and movement, customer experience, constructability and safety.

2.5. Justification for the preferred option

The 'do nothing' option was not considered a feasible alternative as it would be inconsistent with the legislative requirements of the DDA and NSW Government objectives for improving the accessibility of transport interchanges, train stations and commuter car parks across NSW as a priority under the Transport Access Program as described in Sections 2.2 and 2.3. The 'do nothing' option would also not help encourage the use of public transport as no pedestrian upgrades would be made.

Based on the remaining options, Option 3 was identified as being the preferred option based on the MCA. Option 3 was considered to be preferred design due to the following as this option would:

- achieve DSAPT compliance without significant environmental negative impacts
- locate Platform 2 lifts closer to the Boarding Assistant Zone (BAZ)
- maintain existing access to Platform 2 via ramp
- reduce visual impacts on train driver visibility, platform services, and landscape impacts
- reduce the number of station closures during construction therefore minimising disruption to the community
- reduce the overall construction work required to construct the Proposal including less regrading/widening between the proposed lift and Platform 2 BAZ
- reduce the need for major structural works to the Shirley Road Overbridge
- minimal impacts to neighbouring properties than options assessed.

The preferred option was then further refined and designed as the Proposal discussed in Chapter 3.

3. Proposal description

Chapter 3 describes the Proposal and summarises key design parameters and construction methodology. The description of the Proposal is based on a concept design and is subject to detailed design.

3.1. The Proposal

As described in Section 2.2, the Proposal involves an accessibility upgrade of Wollstonecraft Station as part of the Transport Access Program which would improve accessibility and amenity for customers. The Proposal would include the following key elements:

- construction of 2 new lifts connecting to Platform 1 and 2
- reconfiguration of station building to accommodate one unisex family accessible toilet, two unisex ambulant toilets, maintaining cleaners' room and construction of new Main Switch Room
- modification of waiting area on both platforms for accessible entry and level access
- construction of new canopy at boarding assistance zones on Platform 1 and 2
- raising, stabilisation and regrading of station platforms for compliance
- modification of the Shirley Road Overbridge by widening and re-grading the northern footpath along with new compliant handrails and accessible entry points
- one new kiss and ride bay and one DSAPT compliant car parking space on Shirley Road.

The removal of existing billboard advertisements to accommodate the new pedestrian ramp connecting to the Shirley Road Overbridge would be part of an early works component, and assessed under a separate process to this REF.

3.2. Scope of works

Details of the proposed work to take place at the station to improve accessibility and customer experience include the following components described below.

3.2.1. Lifts and accessibility

- Construction of a new lift on Platform 1 connecting the Shirley Road entry
- Accessible return ramp from Shirley Road and the Shirley Road Overbridge to Platform 1 lift
- Construction of a new lift on Platform 2 connecting Telopea Road and the Shirley Road Overbridge
- Accessible footbridge ramp from the Shirley Road Overbridge to Platform 2 lift accessible path.

3.2.2. Platform works

- Upgrading of the Boarding Assistance Zone on Platform 1 and 2 including new sheltered and wheelchair waiting areas
- Stabilising and grading Platform 1 and 2 including new TGSIs and yellow line marking.

3.2.3. Station building works including

- Reconfiguration of Platform 1 existing store room and toilets to accommodate one unisex family accessible toilet, two unisex ambulant toilets and maintaining the cleaners' storeroom on Platform 1
- Construction of a new Electrical Mains Switch Room at the southern end of the Platform 1 station building
- Minor modification to upgrade the ventilation for the existing communications equipment room
- Modifications to the Platform 1 waiting area to provide level access entry to the station
- Floor levelling of the existing waiting room on Platform 2 to provide accessible entry.

3.2.4. Shirley Road and Overbridge works

- Widening and regrading of the footpath on the Shirley Road Overbridge into the carriageway
- Reconfiguration and reduction in size of the existing overbridge traffic lanes and medians
- Installation of new compliant handrails to the roadside of the footpath
- Modifications to eastern and western access points on Shirley Road Overbridge approaches with ramps.

3.2.5. Intermodal upgrades

- Provision of one new compliant accessible car parking space and one kiss and ride bay on Shirley Road
- Relocation of existing mail zone further east two car spaces from current location
- Provision of new direct accessible path from the new kiss and ride bay and DDA car parking space to the proposed lifts
- Relocation of the existing bike racks on the Platform 1 side of the station to accommodate a new Mains Switch Board and enclosure.

3.2.6. Ancillary works including

- Provision of new TGSIs, safety zone markings, line marking and handrails
- Provision of accessible seating on the eastern station entrance
- Installation of additional CCTV cameras, hearing loops and upgrading of Public Address system to accommodate the new works
- New wayfinding signage, Opal card readers, public telephones and rubbish bins
- Provision of electrical upgrade to support the operation of the new lifts and station operations with installation of an AusGrid electrical transformer (about 3.6 square metres) near Shirley Road entrance of Platform 1.

3.2.7. Materials and finishes

Materials and finishes for the Proposal would be selected based on the criteria of durability, low maintenance and cost effectiveness, and to minimise visual impacts. Life cycle impacts would also be taken into account in the selection process through the consideration of environmental impacts of materials from the point of extraction, transportation, operations and end of life.

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

Subject to detailed design, the Proposal would include the following materials and finishes for the key elements:

- lift structure – concrete lift shaft with glazing, painted steel canopy, prefinished metal roof sheeting and downpipes (dark charcoal grey) and soffit lining to canopies
- footpaths and ramps – stainless steel handrails, concrete with non-slip textured finish and broom finished concrete pathways
- regraded platform surface – asphalt platform surface.

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

3.2.8. Engineering and environmental constraints

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

Existing structures: the placement and integrity of existing structures were considered during the development of the design – these structures included the platforms, station buildings and Shirley Road Overbridge.

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 track, and safe working provisions.

Heritage: The Wollstonecraft Railway Station Sign, located on Platform 1 is listed on the RailCorp Section 170 Heritage and Conservation Register (Item 4800121). There are also four heritage items and conservation areas listed on the *North Sydney Local Environmental Plan 2013* in proximity to Wollstonecraft Station including North Sydney bus shelters (Items I0407), The Briars (Item I1118), House (Item I1111) and Wollstonecraft Conservation Area (Item CA25).

The upgrade and refurbishment work would not have potential impacts on the heritage significance of Wollstonecraft Station. Future (detailed) design development would consider the mitigation measures from the Statement of Heritage Impact (SoHI) identified in Section 6.5 of this report. The concept design development has taken this potential impact into consideration and explored all possible opportunities for mitigation.

Construction access: customer access to the station would be maintained throughout the construction works except during rail possession periods. Generally access would be maintained at six locations at the following:

1. Platform 1 (eastern side of railway track) via Milner Crescent
2. Platform 1 and Shirley Road, south of station
3. Platform 2 (western side of railway track) via Telopea Street, south of station
4. Platform 2 via Milray Avenue
5. Paved footpath along Shirley Road Overbridge
6. Platform 1 and 2 via rail corridor underpass.

Shirley Road access to and from the community would be maintained (one lane) during construction including Shirley Road Overbridge footpath upgrades and modification of lanes as well as other construction activities including lift installation work involving the use of a crane.

The adjacent commuter car park to Wollstonecraft Station would be fully closed during construction for laydown and compound areas during rail possession periods (defined in Section 3.3). Commuters would be unable to access the car park during this period. Access to the commuter car park would be available during typical construction period with 18 spaces available.

Platform 2 lawn area would be closed to allow construction work and also be used as a laydown area.

Utilities: A Dial Before You Dig (DBYD) search and a Detailed Site Survey conducted have identified a number of utilities in the vicinity of the proposed work.

3.2.9. Design standards

The Proposal would be designed having regard to the following design standards:

- *Disability Standards for Accessible Public Transport 2002* (issued under the *Commonwealth Disability Discrimination Act 1992*)
- Building Code of Australia (BCA)
- relevant Australian Standards
- Transport for NSW Asset Standards Authority standards
- Sydney Trains standards
- Guidelines for the Development of Public Transport Interchange Facilities (Ministry of Transport, 2008).
- Crime Prevention Through Environmental Design (CPTED) principles
- Council standards, codes and guidelines (where relevant)
- *Sydney Trains Heritage Guidelines and Conservation Guide* for canopies, interpretation, conduit and fixings, railway bridge and platforms (March 2018)
- other Transport for NSW policies and guidelines.

3.2.10. Sustainability in design

The Proposal is targeting a rating using the Infrastructure Sustainability Council of Australia (ISCA) 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, energy and greenhouse gases.

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. The Proposal is targeting an individual 'Excellent' rating under the IS Rating Scheme version 1.2.

3.3. Construction activities

3.3.1. Work methodology

Subject to approval, construction is expected to commence in Q3 2020 and take around 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 for NSW.

The proposed construction activities for the Proposal are identified in Table 3-1. This staging is indicative only and is based on the current concept design and may change once the detailed design methodology is finalised.

Table 3-1 Indicative construction staging for key activities

Activity	Works completed	Timing (indicative) ¹
Activity 1: Site establishment and enabling work	<ul style="list-style-type: none">• establish site compounds (i.e. erecting fencing, tree protection zones, site offices, amenities and plant/material storage areas)• establish temporary facilities as required (e.g. temporary access stairs, temporary toilets, temporary construction lights etc.)• erect site hoarding / fencing as required• service location or relocation.	Standard hours, out of hours and night-works 3 months
Activity 2: Lift work	<ul style="list-style-type: none">• excavate and rock breaking for lift pits/foundations• waterproof (as required), install reinforcement, formwork and concrete to form the lift pit• erect glass and steel shaft structure• lift installation and commissioning• implement architectural fit-out around lift shaft including new awning over the lift.	Standard hours, night-works and rail possession period 12 months
Activity 3: Ramp upgrade	<ul style="list-style-type: none">• perform earthworks for new ramp grading• install ramp formwork and structure• install ramp fit out of new hand rails, seating and TGSI's.	Standard hours and out of hours 12 months

Activity	Works completed	Timing (indicative) ¹
Activity 4: Kiss and ride and accessible parking space	<ul style="list-style-type: none"> reconfigure the existing roadway (kerb, line marking, etc.) to accommodate the upgraded accessible parking and kiss and ride bays. 	Standard hours and rail possession period 3 months
Activity 5: Shirley Road Overbridge work	<ul style="list-style-type: none"> realign traffic lane markings on Shirley Road Overbridge and tie in with west and east approaches widen northern side footpath on bridge. 	Standard hours and rail possession period 3 months
Activity 6: Station building works	<p>Platform 1</p> <ul style="list-style-type: none"> construct new family accessible toilet, two unisex ambulant toilets and reconfigured cleaners storeroom install new ventilation in existing communications room upgrade the general station infrastructure including wayfinding signage, CCTV etc. where applicable install a new Switch Board room. <p>Platform 1 and 2</p> <ul style="list-style-type: none"> install new shelters for Boarding Assistance Zones upgrade the general station infrastructure including DDA signage, CCTV etc. where applicable. 	Standard hours and rail possession period 6 months
Activity 7: Platform stabilisation and upgrade work	<p>Platform 1 and 2</p> <ul style="list-style-type: none"> excavate platforms and construct in-situ concrete surfaces including raising platform height and grading platform surface as required for accessible path floor lowering to existing entrances and shelters relocate platform furniture along accessible paths install new yellow line and tactiles along platforms. 	Standard hours or rail possession period 18 months
Demobilisation	<ul style="list-style-type: none"> install other ancillary features and landscaping remove hoardings clear site remove environmental, safety and traffic controls. 	Standard hours 1 month

¹construction hours for some exceedances may occur during night works (mainly possessions); however would be limited to about 10 nights throughout the construction period.

3.3.2. Plant and equipment

An indicative list of plant and equipment that would be required is provided below. Additional equipment that would likely to be used would be identified during detailed design by the Contractor:

- trucks
- jack hammers
- chainsaw
- piling rig
- franna/mobile cranes
- coring machine
- water cart
- suction trucks
- hi-rail plant including: flatbed trucks, hiab trucks, and dump trucks
- rail mounted elevated work platforms
- forklift
- benders
- vibrating roller/compaction plate
- road rail excavator
- bobcat
- excavator
- demolition saw
- elevated work platform (EWP)
- concrete pump and trucks
- lighting towers
- hand tools
- skip trucks
- hammer drills
- torque wrenches
- impact wrenches
- grinders

3.3.3. Working hours

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

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

Certain works may need to occur outside of standard construction hours. These would occur during scheduled Sydney Trains track maintenance periods, recommended standard hours for night works and works during routine Sydney Trains rail shutdowns. Sydney Trains has scheduled routine rail shutdowns are scheduled closures that would occur regardless of the Proposal when part of the rail network is temporarily closed for maintenance and trains are not operating.

Out of hours works are required on occasion to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers, and to ensure the safety of staff. It is estimated that approximately four rail shutdowns would be utilised to facilitate the following activities:

- site survey and services location investigations within and around the rail corridor
- piling, excavation of pits and installation of lift shafts
- stabilisation, raising and grading of platforms
- installation of electrical containment
- relocation of services.

Out of hours works may also be planned outside rail shutdown periods to reduce the impact on the community. Approval from Transport for NSW would be required for any out of hours work and the affected community would be notified one week prior as outlined in the Transport for NSW *Construction Noise and Vibration Strategy* (TfNSW, 2019a) (refer to Section 6.3 for further details).

3.3.4. Workforce

The peak number of construction vehicles and workforce for the Proposal is expected as follows:

- Light vehicles movements:
 - 10 per week throughout the duration of project
 - 20 per rail possession.
- Heavy vehicles movements:
 - 5 per week throughout the duration of project
 - 15 per rail possession.
- Construction workforce estimates
 - 15 workers daily throughout the duration of project
 - 100 workers per rail possession.

3.3.5. Earthworks

Excavations and earthworks would generally be required for the following:

- the construction of both new lift pits, which would require excavation through the platform surface into the existing soil/fill at this location
- stabilisation of platforms
- installation of electrical work
- other minor civil works including foundation for structures and trenching activities for service adjustment and relocations.

Excavated material of about 1,500 cubic metres would occur and be reused onsite where possible or disposed of in accordance with relevant legislative requirements. The detailed design would confirm the volume of materials to be excavated to accommodate foundations of the lift pits, and other ancillary work.

3.3.6. 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 maximising the reuse of existing materials, use of materials with recycled content and the selection of low carbon materials where practicable and aligning with the requirements of the IS Rating Scheme version 1.2. Materials would be sourced from local suppliers where practicable.

The Proposal would also consider life cycle impacts. The life cycle impacts of a material are calculated by looking at the environmental impacts of materials from the point of extraction, through to transportation, use, operation and end of life.

3.3.7. Traffic access and vehicle movements

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

- temporary parking impacts due to full closure of the commuter car park (36 spaces) during rail possession periods. No available off-street unrestricted parking available within 500 metres
- minor disruptions to pedestrian/cyclist movements in and around the station
- minor increase in traffic on the local road network.

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.

3.3.8. Ancillary facilities

Temporary construction compounds would be required to accommodate construction activities associated with the Proposal including a site office, amenities, laydown and storage area for materials, construction plant and equipment.

Four areas have been proposed for construction compounds/laydown areas as shown in Figure 3-1 and are:

- the existing lawn area in front of the advertising boards on Platform 2 to the south of the retail shops
- the commuter car park to the on the southern side of Shirley Road
- the grass area of Wollstonecraft Station Park
- clear grassland in the rail corridor to the north of the station (beyond the Platform 2 entry).

Impacts associated with utilising these areas have been considered in the environmental impact assessment including requirements for rehabilitation.

3.3.9. Public utility adjustments

The Proposal has been designed to avoid relocation of services where feasible, however further investigation may be required.

A power supply upgrade would be required to the Sydney Trains or Ausgrid network to provide sufficient capacity for the proposed works. The Proposal would include an AusGrid electrical transformer installed near the entrance of Platform 1 measuring about 3.6 square metres. The extent of further required upgrades would be assessed during detailed design and would be designed to the standards of and approved by the relevant utility authorities or Transport for NSW.

Adjustments of public utility would occur and other work that may affect services would be undertaken in consultation with the respective utility authorities.

3.4. Property acquisition

Transport for NSW does not propose to acquire any property as part of the Proposal. A temporary Licence to Occupy or lease of the construction compound area would be obtained from North Sydney Council for the duration of the works for the commuter car park located adjacent to the station.

3.5. Operation and maintenance

The future operation and maintenance of Wollstonecraft Station and affected areas is subject to further discussions with Sydney Trains, Transport for NSW and North Sydney Council. However, the Proposal is not anticipated to significantly alter the current operating arrangements.

Structures and landscaping within the rail corridor would be maintained by Sydney Trains and affected areas outside the rail corridor by North Sydney Council.

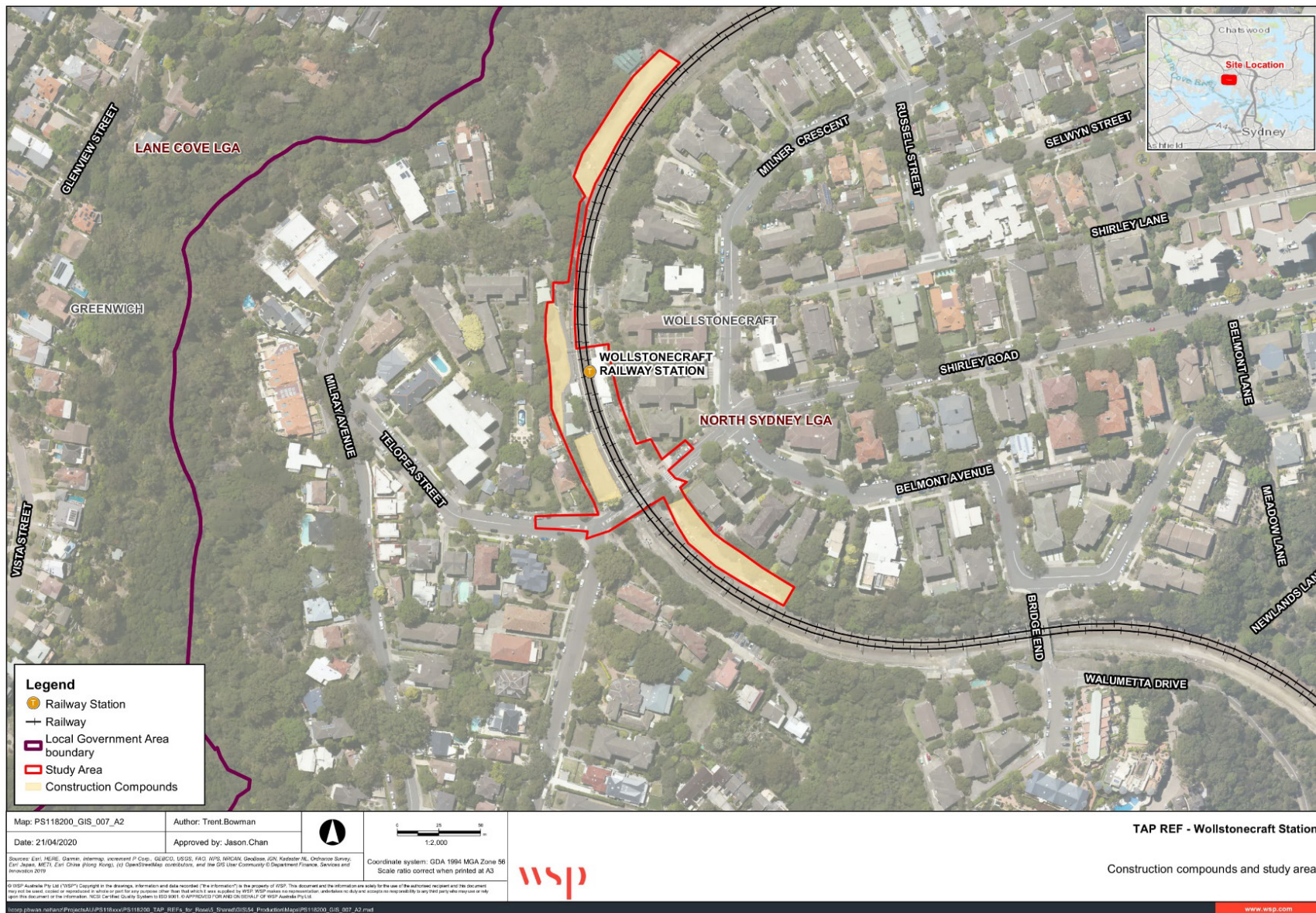


Figure 3-1 Wollstonecraft Station construction footprint and compound areas

4. Statutory considerations

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

4.1. Commonwealth legislation

4.1.1. Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the EPBC Act as 'matters of National Environmental Significance (NES)'. The EPBC Act requires the assessment of whether the Proposal is likely to significantly impact on matters of NES or Commonwealth land. These matters are considered in full in Appendix A.

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

4.1.2. Other Commonwealth legislation

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

Table 4-1 Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</i>	<p>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.</p> <p>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.</p>
<i>Disability Discrimination Act 1992 (DDA)</i>	<p>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.</p> <p>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 Wollstonecraft Station which is consistent with the objectives of this Act.</p>

4.2. NSW legislation and regulations

4.2.1. Transport Administration Act 1988

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

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

- 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.*

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

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

Clause 228 of the EP&A Regulation prescribes the minimum 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 effect on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with clause 228 and Appendix B specifically responds to the factors for consideration under clause 228.

COVID-19 Legislation Amendment (Emergency Measures) Bill 2020

Published on 25 March 2020, the NSW Government introduced this Bill which made changes to the EP&A Act. The changes allow the Minister for Planning and Public Spaces to make an order for development to be carried out without the normal planning approval in order to protect the health, safety and welfare of the public during the COVID-19 pandemic. The Ministerial Orders relevant for this Proposal are centred around extending days for construction work gazetted on 31 March 2020.

The order allows weekday construction site operating hours to be extended to weekends and public holidays.

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 NSW legislation applicable to the Proposal

Applicable legislation	Considerations
<i>Biodiversity Conservation Act 2016</i> (BC Act)	<p>Under Section 2.4 of the BC Act it is an offence to damage the habitat of a threatened species or threatened ecological community, as listed in Schedule 1 and 2 of the Act.</p> <p>Part 7, Division 2 of the BC Act specifies the requirements for biodiversity assessment. Generally, development that is likely to significantly affect threatened species is required to be accompanied by a biodiversity development assessment report (BDAR) and concurrence from the Office of Environment and Heritage.</p> <p>However, under Section 7.8(4), an Environmental Impact Statement is not required for an activity for which a Species Impact Statement has been prepared in accordance with the BC Act if, other than the impact on protected species, the activity does not and is not likely to significantly affect the environment.</p> <p>The site does not contain suitable habitat for any listed threatened species or community and is unlikely to have an impact on any threatened species or community (refer to Section 6.6 for further details).</p>
<i>Biosecurity Act 2015</i>	<p>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 North Sydney Council LGA are identified (refer to Section 6.6).</p> <p>Three Priority Weeds listed under the <i>Biosecurity Act 2015</i> for the Greater Sydney Region were identified in the Proposal including the following:</p> <ul style="list-style-type: none"> • African Olive (<i>Olea europea</i> var. <i>cuspidate</i>) • Asparagus Fern (<i>Asparagus aethiopicus</i>) • Madeira Vine (<i>Anredera cordifolia</i>) <p>Appropriate management methods would be implemented during construction if declared noxious weeds in the North Sydney LGA are identified (refer to Section 6.6).</p>
<i>Contaminated Land Management Act 1997</i> (CLM Act)	<p>The CLM Act regulates significantly contaminated land through requirements for notification to the EPA, investigation, remediation and recovery of costs from the person responsible.</p> <p>The NSW EPA must be notified by the property owner in writing of any contamination identified within the proposal site in accordance with the requirements of Section 60 of the CLM Act.</p> <p>The site has not been declared under the CLM Act as being contaminated (refer to Section 6.8).</p>
<i>Heritage Act 1977</i> (Heritage Act)	<p>Sections 57 and 60 require approval for works which may have an impact upon items listed on the State Heritage Register.</p> <p>Sections 139 and 140 require similarly require approval where relics are likely to be exposed.</p> <p>For any works which may have an impact upon items listed on a Section 170 heritage and conservation register maintained by a government agency, notification to the Heritage Division may be required.</p> <p>There are two listed heritage items located within the Proposal, Wollstonecraft Railway Station Sign and the Wollstonecraft Conservation Area. The station sign is listed on the Sydney Trains Section 170 register (SHI #4800121) and the conservation area is listed on the North Sydney LEP.</p>

Applicable legislation	Considerations
	<p>A heritage impact assessment has been undertaken for the Proposal and is summarised in Section 6.5. No impacts to the station sign are expected. The Wollstonecraft Conservation Area station landscape would have minor impacts due to the following:</p> <ul style="list-style-type: none"> • loss of trees and vegetation removal • installation of lift shaft above the surrounding landscape.
<i>National Parks and Wildlife Act 1974</i> (NPW Act)	<p>Sections 86, 87 and 90 of the NPW Act require approval from OEH for any works which may impact an item of Aboriginal Heritage.</p> <p>Sections 151–153D of the Act specify the uses for which leases, licences or easements can be granted. Section 153 relates to approval for easements which can be granted by the Minister for or for the construction of pipelines, or for the erection of standards, posts, wires and appliances for the conveyance or transmission of electricity, or for any other purpose deemed necessary.</p> <p>The Proposal is unlikely to disturb any Aboriginal objects (refer to Section 6.4). However, if unexpected archaeological items or items of Aboriginal significance are discovered during the construction of the Proposal, all work would cease and appropriate advice sought.</p> <p>The Proposal would not involve impacts to land reserved, or adjacent to, land reserved under the NPW Act.</p>
<i>Protection of the Environment Operations Act 1997</i> (PoEO Act)	<p>The Proposal would not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, Transport for NSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Contractor.</p>
<i>Roads Act 1993</i> (Roads Act)	<p>Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require approval for works on unclassified roads.</p> <p>During construction at rail possession periods, Shirley Road (maintained by North Sydney City Council) would be partially closed temporarily (bi-directional travel will be available at all times) with appropriate traffic management measures. Prior to works commencing, consultation with North Sydney City Council including obtaining Road Occupancy Licence(s) for temporary lane closures to facilitate work would be determined (where required).</p>
<i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act)	<p>Transport for NSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared as part of the CEMP.</p>
<i>Water Management Act 2000</i> (WM Act)	<p>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.</p>

4.2.4. Key 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:

- (a) *‘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* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018*. The Proposal does not require consideration under these SEPPs and therefore do not require further consideration as part of this REF.

State Environmental Planning Policy 55 – Remediation of Land

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

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

Impacts of contaminated lands and potential remediation are in Section 6.8.

4.2.5. North Sydney Local Environmental Plan 2013

The Proposal is located within the North Sydney LGA. The Infrastructure SEPP prevails over all other environmental planning instruments (such as LEPs) except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018*. Notwithstanding, the provisions of *North Sydney Local Environmental Plan 2013* were considered (refer to Table 4-3) which identifies land use specific to the Proposal).

Land uses within the Proposal site include the following and shown in Figure 4-1:

- surrounding local area is mainly residential (zoned R2, R3 and R4: Low, Medium and High Density Residential)
- north of the station includes public recreation (zoned RE1) and environment protection zones (zoned E2)
- the Proposal location is zoned as SP2 and noted within a Special purpose zone (Infrastructure)

Table 4-3 Relevant provisions of the North Sydney LGA

Provision description	Relevance to the Proposal
Clause 2.3 – Zone objectives and Land Use Table	Applicable land zones <ul style="list-style-type: none"> • SP2 Infrastructure (Railway) for the proposed work associated with the station and Shirley Road Overbridge • R3 Medium Density Residential for the proposed work on the west side of the station • R4 High Density Residential for the proposed work on the east side of the station and associated work with Shirley Road such as the new accessible parking spaces • RE1 Public Recreation for the proposed work along Platform 1 to rebuild and regrade the platform.
Clause 2.3 – Zone objectives and Land Use Table (cont.)	Zone objectives <ul style="list-style-type: none"> • SP2 Infrastructure (Railway) <ul style="list-style-type: none"> ○ to provide for infrastructure and related uses and to prevent development that is not compatible with or that may detract from the provision of infrastructure. • R3 Medium Density Residential <ul style="list-style-type: none"> ○ to provide for the housing needs of the community within a medium density residential environment ○ to provide a variety of housing types within a medium density residential environment ○ to enable other land uses that provide facilities or services to meet the day to day needs of residents ○ to encourage the development of sites for medium density housing if such development does not compromise the amenity of the surrounding area or the natural or cultural heritage of the area ○ to provide for a suitable visual transition between high density residential areas and lower density residential areas ○ to ensure that a high level of residential amenity is achieved and maintained.

Provision description	Relevance to the Proposal
	<ul style="list-style-type: none"> • R4 High Density Residential <ul style="list-style-type: none"> ○ to provide for the housing needs of the community within a high density residential environment ○ to provide a variety of housing types within a high density residential environment ○ to enable other land uses that provide facilities or services to meet the day to day needs of residents ○ to encourage the development of sites for high density housing if such development does not compromise the amenity of the surrounding area or the natural or cultural heritage of the area ○ to ensure that a reasonably high level of residential amenity is achieved and maintained. • RE1 Public Recreation <ul style="list-style-type: none"> ○ to enable land to be used for public open space or recreational purposes ○ to provide a range of recreational settings and activities and compatible land uses ○ to protect and enhance the natural environment for recreational purposes ○ to ensure sufficient public recreation areas are available for the benefit and use of residents of, and visitors to, North Sydney. <p>The Proposal is consistent with the objectives of SP2 as development of a rail infrastructure is permissible with consent for rail facilities. Shirley Road would be temporarily closed during rail possession periods and notification would be advised with North Sydney Council.</p> <p>The other land uses identified within proximity of the Proposal include R3, R4 and RE1. These land uses are not directly consistent with the Proposal; however, these land uses are not within the Proposal and are adjacent to it and support the operations of the station. The Proposal would not alter these surrounding land use types and maintain the objectives of these land uses.</p> <p>As the provisions of ISEPP prevail over the North Sydney LEP. development consent from the North Sydney Council LEP is not required.</p>
Clause 6.10 – Earthworks	<p>Clause 6.10 of the North Sydney 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.</p> <p>By virtue of Clause 5(3) and 79 of the Infrastructure SEPP, the Proposal is permissible without development consent. Consideration of the potential impacts and mitigation measures for earthworks for the Proposal is outlined in Section 6.8.</p>

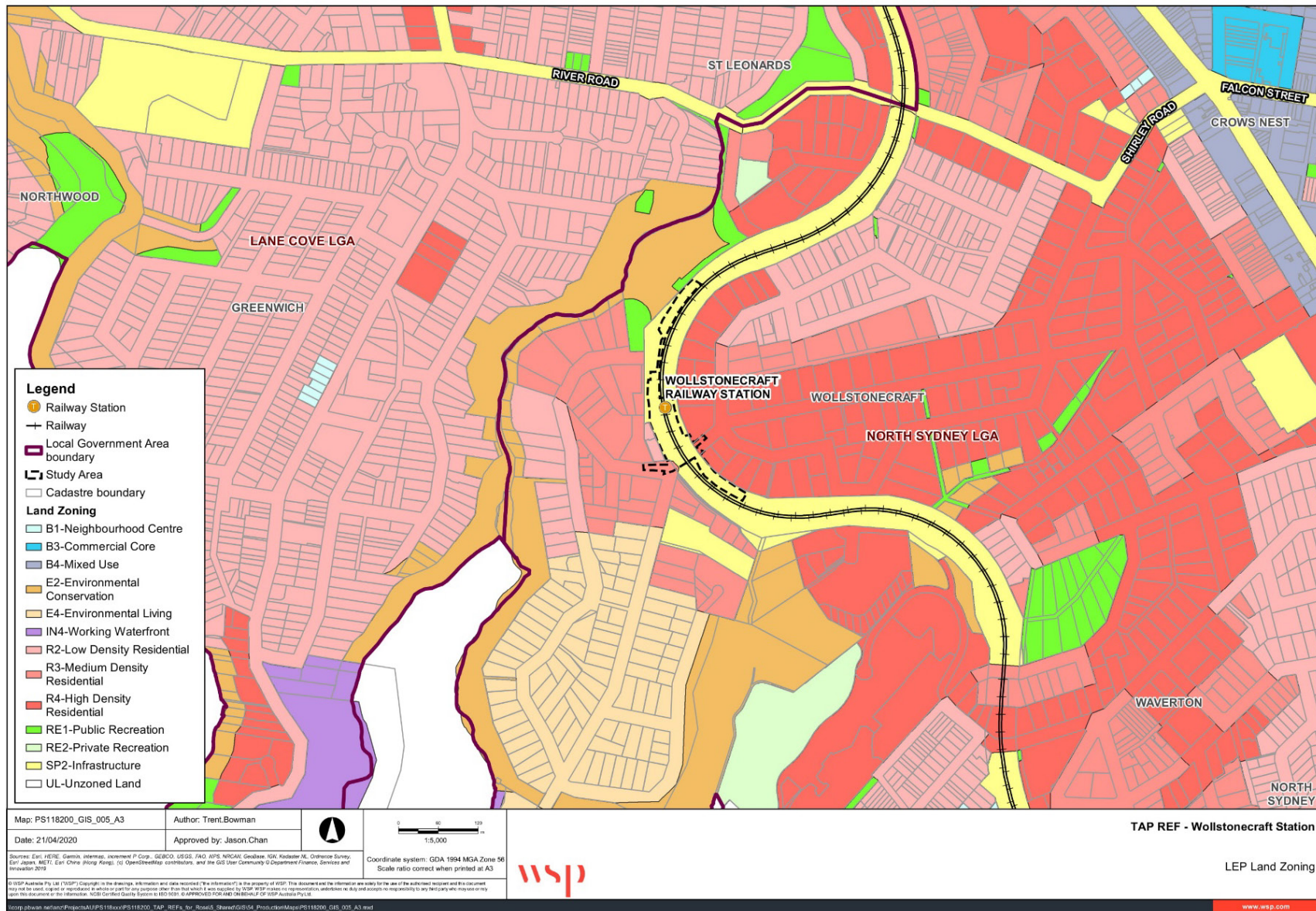


Figure 4-1 Zoning map

4.3. Ecologically sustainable development

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

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

The principles of ESD have been adopted by Transport for NSW throughout the development and assessment of the Wollstonecraft Station Upgrade. Section 6.8 summarises how ESD has been incorporated in the design development of the Proposal. Section 6.13 includes an assessment of the Proposal on sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5. Community and stakeholder consultation

Chapter 5 discusses the consultation strategy adopted for the Proposal and the results of consultation with the community, relevant government agencies and stakeholders.

5.1. Stakeholder consultation during concept design

Key stakeholders for Wollstonecraft Station, including a range of Transport for NSW divisions and Sydney Trains, were engaged during the development of the Proposal to provide insights into the scope of work for the Proposal, and to also participate in the development and assessment of the station improvement options.

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: <ul style="list-style-type: none">substantial impact on stormwater management servicesgenerating traffic that would place a local road system under straininvolve connection to or impact on a council owned sewerage systeminvolve connection to and substantial use of council owned water supplysignificantly disrupt pedestrian or vehicle movementinvolve significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes work that would: <ul style="list-style-type: none">cause temporary disruption of pedestrian and vehicle movement during constructionimpact on Council-operated footpaths during regradingtemporarily impact the availability of the commuter car park for use as the construction compound. Consultation with North Sydney Council would continue to be undertaken throughout the public display, detailed design and construction phases of the Proposal.
Clause 14 Consultation with Councils – development with impacts on local heritage	Where railway station works: <ul style="list-style-type: none">has a 'not minor or inconsequential impact' on local heritage item (if not also a State heritage item)substantially impact on a heritage conservation area.	As assessed in the heritage impacts further described in Section 6.5, the Proposal is identified to have no impacts on the Wollstonecraft Station sign and minor heritage impacts from the following: <ul style="list-style-type: none">minor impact to the heritage fabric and values of the station as a result of the proposed new liftsnew access ramps impacting the landscape setting of the stationplatform regrading and rebuilding resulting in the loss of the early platform structureimpacts on the historic three brick drain as a result of the proposed platform regrading.

Clause	Clause particulars	Relevance to the Proposal
Clause 15 Consultation with Councils – development with impacts on flood liable land	Where railway station works: <ul style="list-style-type: none"> impact on land that is susceptible to flooding – reference would be made to <i>Floodplain Development Manual: the management of flood liable land</i>. 	The Proposal is not located on land that is susceptible to flooding. Consultation with North Sydney Council is not required in regard to this aspect. Refer to Section 6.9.
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	Where railway station works: <ul style="list-style-type: none"> impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land 	The Proposal is not located within a coastal vulnerability area as per the <i>Coastal Management Act 2016</i> . Consultation with North Sydney Council is not required in regard to this aspect.
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	Where railway station works: impact on flood liable land -written notice must be given (together with a scope of works) to the State Emergency Services and taken into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given.	The Proposal is not located on land that is susceptible to flooding. Consultation with State Emergency Service is not required in regard to this aspect. Refer to Section 6.9.
Clause 16 Consultation with public authorities other than Councils	For <i>specified development</i> which includes consultation with the NSW Environment, Energy and Science (EES, formerly OEH) for development that is undertaken adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i> , and other agencies specified by the Infrastructure SEPP where relevant. Although not a specific Infrastructure SEPP requirement, other agencies Transport for NSW may consult with could include: <ul style="list-style-type: none"> Roads and Maritime Sydney Trains NSW TrainLink EES (formerly OEH). 	The Proposal is not located nearby or within any lands reserved under the <i>National Parks and Wildlife Act 1974</i> , Transport for NSW is not required to provide undertake consultation with the EES.
Clause 104(2A) Traffic generating development	A public authority, or a person acting on behalf of a public authority, must not carry out development to which this clause applies that this Policy provides may be carried out without consent unless the authority or person has: <p>(a) given written notice of the intention to carry out the development to RMS in relation to the development, and</p> <p>(b) taken into consideration any response to the notice that is received from RMS within 21 days after the notice is given.</p>	The Proposal is not expected to increase traffic substantially as improved works are focused on upgrading existing station elements to be accessible. Consultation with North Sydney Council would not be required.

5.3. Consultation strategy

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

The objectives of the consultation strategy are to:

- provide accurate and timely information about the Proposal and REF process to relevant stakeholders
- raise awareness of the various components of the Proposal and the specialist environmental investigations
- ensure that the directly impacted community is 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.

5.3.1. Public display

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

- public display of the REF at on the project web page
- installation of information signage at the station with QR codes taking customers to the project webpage
- distribution of a project newsletter outlining the Proposal and inviting feedback on the REF to the local community and available for collection by rail customers at the station
- advertisement of the REF public display in local newspapers with a link to the Transport for NSW website that includes information about the Proposal and how to provide feedback
- consultation with council, Sydney Trains, NSW TrainLink and other non-community stakeholders
- targeted social media campaigns.

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

The REF would be placed on public display on the [TfNSW website¹](#), [Have Your Say website²](#). Under normal circumstances, printed copies of the REF would be available at varying locations, however, due to Coronavirus, these will not be available.

Further information on the Proposal may be requested by contacting the Project Infoline (1800 684 490) or by [email³](#).

Feedback can be sent to:

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

Or submitted:

- via <http://www.nsw.gov.au/wollstonecraft-station-upgrade>

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

5.4. Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal plus a 50 metre radius, on 20 Jan 2020. No Aboriginal sites were identified in or near the Proposal site.

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

5.5. Ongoing consultation

At the conclusion of the public display period for this REF, Transport for NSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by Transport for NSW before determining whether to proceed with the Proposal. Ongoing consultation with key stakeholders would continue including Sydney Trains, NSW TrainLink and North Sydney Council throughout detailed design and construction.

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

¹ <https://www.transport.nsw.gov.au/wollstonecraft>

² <http://www.nsw.gov.au/wollstonecraft-station-upgrade>

³ projects@transport.nsw.gov.au

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

5.5.1. Effect of coronavirus on engagement

In response to the evolving Coronavirus situation, Transport for NSW is following NSW Health advice and changing the way it approaches community consultation for important transport infrastructure projects.

It is important for the community to have their say on all transport infrastructure projects and while this isn't business as usual, Transport for NSW will ensure all appropriate community consultation is carried out.

This means consultation will be carried out in different ways, including via social media, teleconferencing and video conferencing, to ensure the community can practice social distancing.

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

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.

Project-specific mitigation measures are discussed in each of the sub-sections, while a full list of mitigation measures for the Proposal is provided in Section 7.2.

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

6.1. Traffic and transport

This section provides a summary of the *Traffic, Transport and Access Impact Assessment* prepared by WSP (2020) and which is attached as Technical Paper 1. The assessment included the following tasks:

- review of the existing traffic, public transport, parking, pedestrian and cyclist conditions within the Proposal
- assessment of station access issues relating to the proposed upgrades during construction
- identification of suggested improvements and mitigation measures that might be implemented to minimise the traffic and road safety related impacts created by the proposed upgrades.

6.1.1. Existing environment

Surrounding road network

The existing road network around Wollstonecraft Station mainly comprises of local roads (residential streets) with posted speed limit of 50 kilometres per hour. The primary access to the station is via Shirley Road. Other roads within the Proposal include the following:

- Telopea Street: two-lane, two-way road that intersects with Shirley Road and links residential areas on the western side of the railway line
- Milray Avenue: two-lane, two-way road in a north-south direction adjacent to the railway line on the western side of the station and providing access to the pedestrian footpath on the eastern side of the station
- Belmont Avenue/Milner Crescent: local roads which form give-way controlled intersection with Shirley Road on the eastern side of the station

Parking

Wollstonecraft Station has a formal commuter car park located to the south of Shirley Road with entry near the zebra crossing. It provides 36 commuter car parking spaces with no formal accessible car spaces. The surrounding streets have mixed parking restrictions including areas of unrestricted as well as five-minute, one-, two- and four-hour restricted parking mainly for weekdays.

Taxi and Kiss and Ride

Although there are no posted taxi or kiss and ride bay at the station, a site visit observation noted that the existing no parking/5-minutes and 15 minute parking spaces on Shirley Road (eastern and western sides) are used for drop off and pick up.

Public transport

Rail

Wollstonecraft Station provides the following rail services and frequency of weekday services:

- T1 North Shore Line providing services to and from City to Berowra every three to six minutes
- T1 Western Line providing services to and from Emu Plains or Richmond to City every five to 10 minutes
- T9 Northern Line providing services to and from North Shore to Hornsby every 15 minutes
- CCN Central Coast Line providing services from Central to Newcastle via Strathfield or Gordon every 15 minutes.

Journey time between Wollstonecraft and Central is around 15 to 20 minutes. The average weekday 2017 rail patronage for this station is around 5,470 and at peak hour is around 955. The predicted patronage data is expected to increase 24 per cent over a 19-year period. In 2036, the average weekday total patronage is expected to be around 6,800 passengers and average weekday peak hour around 1,180 passengers.

Bus

Bus services are limited at Wollstonecraft Station with only one route available, route 265, servicing Lane Cove to North Sydney via Greenwich. This bus stop is located on the station side of Milner Crescent, approximately 100 metres to the east of the station. Two services are available from this stop during the peaks (7.00am – 9.00am and 4.00pm – 6.00pm) each day operating half hourly frequency. The service also operates hourly on Saturdays and does not operate on Sundays.

Active transport (bike and pedestrian)

There are currently bike rails at the entrance to Platform 1 and adjacent to underpass on Platform 2 side. There are no dedicated cycleways; however, there are several on-road cycling routes within the station including along Shirley Road.

For pedestrian facilities, the footpaths around the station are located on both sides of the station connecting to Milner Crescent and Milray Avenue, and two on both ends of Shirley Road Overbridge. These paths are at steep grades between five to 10 per cent and are not DSAPT access compliant.

Access to Wollstonecraft station are at four main access points including:

- an access route from local roads connecting to Platform 1 and 2
- the pedestrian underpass located at the northern end of the station
- Shirley Road, with access provided from the zebra crossing to the east of the station
- the pedestrian refuges on Shirley Road, Telopea Street and Milner Crescent.

Road safety

Within the past five years, the road network surrounding Wollstonecraft has had no fatal incidents between January 2014 and December 2018. There was one moderate injury crash recorded at the curved section of Milner Crescent, approximately 150 metres north of Shirley Road.

6.1.2. Potential impacts

a) Construction phase

Site compound and haulage routes

As described in Section 3.4, there are four identified site compounds, laydown areas or storage for the Proposal. The related haulage routes around the station are restricted and may not be suitable to accommodate large heavy vehicles easily.

Potential haulage routes for heavy vehicles to access to and from these locations involve accessing Shirley Road, Falcon Street and Warringah Freeway. The Pacific Highway is not identified as an approved 19-metre B-double route.

For access toward the northern compound site accessed along Russell Street, this entry and exit is not suitable for heavy vehicles due to the narrow road width and tight curve and height difference of the entrance and Russell Street intersection. A heavy vehicle access plans would be prepared as part of the construction traffic control management.

Figure 6-1 shows the potential haulage route to and from the Proposal. Final construction haulage route would be determined by the nominated Contractor during detailed design.

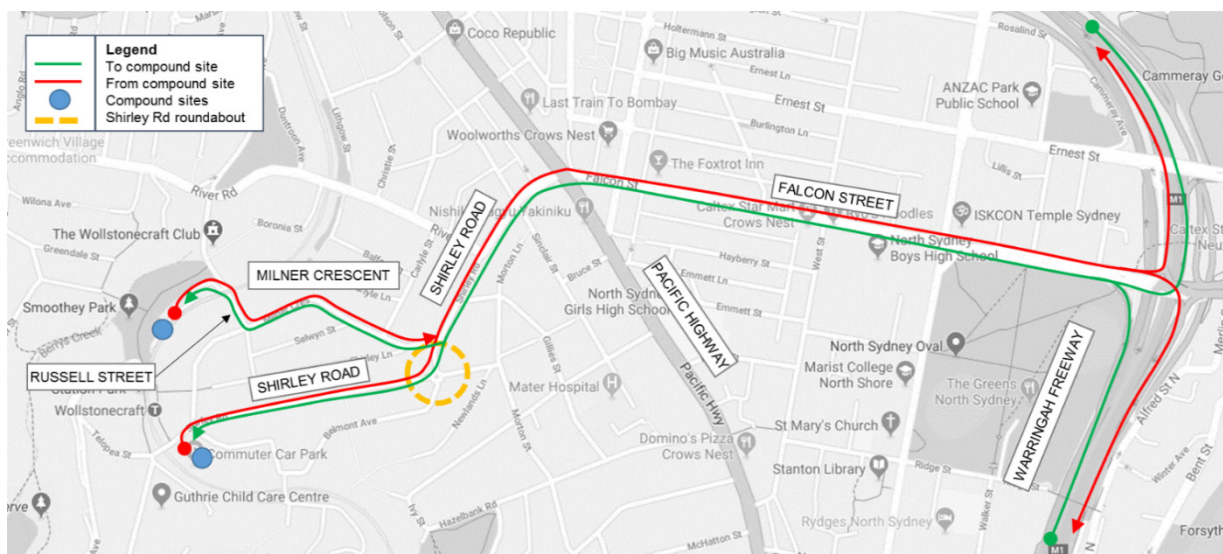


Figure 6-1 Potential haulage routes to the Proposal

Traffic

Traffic generated as part of this Proposal is not expected to exceed around 20 light vehicles and three heavy vehicles on average per day during the typical construction period. A majority of the proposed construction traffic would be from light vehicles (including utility vans) from construction workers. Heavy vehicle movements would be minimal and infrequent. These trips would primarily be associated with the delivery and removal of materials, plants and equipment as required.

During the rail possession periods, construction workforce numbers are estimated to increase to around 100 workers per possession as noted in Section 3.3.4. Construction impacts are expected to occur as the commuter car park would be closed and the surrounding street parking would not be able to accommodate the number of expected vehicles. The assessment recommends the Contractor consider organising transport including the use of shuttle buses to/from the nearest open railway station to reduce the load on surrounding roads along with encouraging workers to carpool as there would not enough parking to accommodate the workforce. Incorporating these assumptions measures, it is expected that less than 50 light

vehicle and 15 heavy vehicle movements would be generated per day during rail possession periods.

Given the minimal traffic generated during construction, including both staff light vehicle trips and construction heavy vehicle trips, the surrounding road network and intersections would comfortably accommodate the project related vehicle trips and continue to perform within capacity.

Access

A minor impact is expected due to the partial lane closure of Shirley Road which serves as the only access in and out of the area west of the station for residents. The eastbound lane closure would occur during rail possession period for lift works and involving a crane.

Travel time and congestion on Shirley Road is expected to increase with delays and queues at nearby intersections; however, existing road traffic was observed as low, so a minor impact is expected combined with appropriate traffic management controls.

Emergency vehicle access

No impacts are expected for emergency vehicles as access would be maintained and advised of all planned changes to traffic arrangements prior to alterations. Advice would include information about upcoming lane closure, traffic disruptions, anticipated delays to traffic, extended times of work and locations of any road possessions.

Parking

Construction for the Proposal would require the full and partial closure of the existing commuter car park. During the typical construction periods, a partial closure of the car park is expected and result in a loss of up to 18 car parking spaces. The commuter car park would be fully closed during the rail possession periods resulting in a temporary loss of 36 car parking spaces during these periods.

During typical construction periods, based on the partial closure, there may be some limitations in commuter turning movements with the construction site and construction vehicles conflicting with commuter traffic and parking. There are no other alternative car parking facilities within a 500-metre radius of the Proposal. As the existing car park is unavailable, commuters would have to find alternatives such as the following:

- using unrestricted on-street parking resulting in an extended walk to the station
- riding public transport from another nearby station.

These options would likely result in different and longer journey times for commuters.

During the rail possession periods, construction parking for workers would be limited to the compound sites located within the existing commuter car park and also the northern site compound. These periods would be limited to about 10 nights throughout the construction period over weekends only when commuter parking demand is lowest. Assuming the shuttle service (described above) is made available during rail possession periods, the service would reduce load on the commuter car park as there would be insufficient parking available for all 100 workers during rail possession periods. Considering this, sufficient off-street parking would be provided for workers and Transport for NSW staff that travel to site inside of the compound site to ensure that there is no overspill onto on-street parking in nearby streets.

Kiss and ride

There is potential for temporary disruptions to access the kiss and ride bay around the station due to construction work along Shirley Road. Passengers would be able to use time restricted, on-street parking spaces when the kiss and ride bay is not available.

Public transport

During construction, there are no expected impacts to existing bus operations as the existing bus stop near Wollstonecraft would remain operational.

However, during track possession periods, rail access would be closed and it is expected that bus replacement services would be made available with some increased travel time.

No impacts are expected to existing bus or rail services operation during construction.

Active transport

Pedestrian

Pedestrian access would be maintained during non-possession construction periods and works undertaken within these areas would be managed and controlled throughout the construction period to ensure there is no impact to public safety. Impacts to pedestrians would only occur if one or more of the station access points are closed, requiring pedestrians to circle the station and enter via the alternative entrances, increasing overall trip journey time and a degree of disruption.

Possible access closures would still allow for access to bus stops on Milner Crescent and access to either platform via the underpass. These closures would be managed with pedestrian detour measures including traffic controllers (for pedestrians) and detour signs directing pedestrians to alternative accesses.

During rail possession periods, the station would be closed, and no access would be made available. Closed station access paths that are used as thoroughfares between Milner Crescent, Milray Avenue and Shirley Road will be impacted.

An impact for pedestrians is from the closure on Shirley Road northern kerb footpath for the crane setting and upgrading of the northern footpath along Shirley Road bridge over railway lines. Pedestrians may use the southern kerb footpath which is very narrow and require traffic control and bollards/cones set up for safety.

Cyclist

Impacts to cyclists would be minimal and occur during the Shirley Road lane closure for cranes and footpath upgrades as well as the relocation of cycle parking. All other roads and shared cycle paths would remain open and only need some traffic management as with general traffic. With the cycle parking relocation, it would be necessary during the short changeover period with limited formal parking for cyclists at the station location to find alternative parking areas for their equipment such as the cycle hoops north of the station.

b) Operation phase

Traffic

The Proposal provides improved station accessibility and usability providing increased commuter experience and attracting greater commuter use. The increase use of the station is not expected to have direct increase in traffic generation during operation. As such, it is considered that negligible traffic impacts would be expected.

Parking

During operations, the commuter car park and surrounding on-street parking would return to existing conditions. The proposed disabled accessible car parking spaces and kiss and ride bay on the north east side of Shirley Road would provide a beneficial impact for station users.

Public transport

There are no impacts on bus or rail operations expected during operation of the Proposal. Improved station accessibility to bus and station by providing a lift could encourage public transport use and transfer from buses to trains.

Active transport

Pedestrian access would be improved from the proposed new lifts and ramps providing an improved user experience from improved facilities. The improved access would provide enhanced accessibility of the station for customers with disabilities, customers with less mobility, parents/carers with prams and customers with luggage.

The existing bike racks would be relocated within the station precinct, maintaining cyclists' ease of access to travel by bike to the station including access to the platforms via the new lifts and ramp. Exact location of the relocated bike racks would be determined during detailed design.

6.1.3. Mitigation measures

The full list of mitigation measures for potential traffic and transport impacts are described in Table 7-1 in Section 7.2. The following are a summary of site specific mitigation measures recommended for this Proposal:

- whilst not a specific part of a Construction Traffic Management Plan, conducting a drive-through assessment or swept path analysis is highly recommended to ensure that sufficient manoeuvring space is provided for the largest design vehicle along the proposed haulage routes
- heavy vehicle access plans would be prepared as a part of the construction traffic control management that would be implemented during the construction period for access between the northern compound site and Russell Street
- a Traffic Control Plan (TCP) to be developed for any construction works that requires lane closure on Shirley Road. TCP implementation will ensure adequate warning and guidance is provided to road users, thus minimising road related traffic impacts. TCP would be required to be submitted to Transport Management Centre (TMC), Transport for NSW, where required. This could also include management of general and construction vehicles entering and exiting the commuter car park and site compounds
- the Contractor is to acquire a road occupancy license and crane permits for operating on road
- in parallel with lift installation, existing ramp access to Wollstonecraft Station platform level should be maintained. If any closure of the existing ramp access would be required for the lift installation, the construction works should be programmed to undertake during a scheduled track possession period to minimise the impacts to pedestrians
- staging new DDA compliant ramps, lifts and stairs (including demolishing existing non-complaint path) is necessary to minimise the impacts to pedestrians and cyclists accessing the station from the proposed works
- suitable access must be maintained between Wollstonecraft Station and the Shirley Road and Milray Avenue entrances during works to provide pedestrians with safe passage through or bypass of the construction areas and construction vehicle movements

- adequate width of vehicular and pedestrian paths should be provided with a temporary delineation during the westbound lane closure period over the Shirley Road Overbridge
- ensure priority building of relocated cycle racks to limit impacts to cyclists by minimising time without parking facilities
- provision of shuttle bus services during rail possession periods to accommodate workforce.

6.2. Landscape and visual amenity

This section provides a summary of the *Landscape and Visual Impact Assessment* prepared by Iris Visual Planning and Design (2020) and which is attached as Technical Paper 2. The assessment included the following tasks:

- planning review context of regional, state and local planning documents
- guidelines using the following:
 - *Guidance note EIA-N04 Guidelines for Landscape Character and Visual Impact Assessment*, NSW State Government, Roads and Maritime Services (2018)
 - *The Guidance Note for Landscape and Visual Assessment* (GNLVA), Australian Institute of Landscape Architects Queensland (2018)
- landscape and visual amenity assessment identifying existing conditions, visual sensitivity, magnitude of change, level of visual impact and mitigation opportunities
- assessment of urban design and landscape character impacts.

6.2.1. Existing environment

Landscape character

Wollstonecraft is a peninsular and fringed by parks and reserves including the Gore Cove Reserve along Berrys Creek in the northwest and Badangi Reserve to the southeast. The residential areas have a leafy character with mature gardens and street trees.

The visual catchment of the Proposal is largely contained by existing mature vegetation within the station precinct and surrounding residential areas, which enclose and filter views to the station. The station is visually enclosed by landform and existing mature vegetation within the station precinct and on surrounding properties.

There is a predominance of heritage character houses in the residential areas to the southwest of the station as the area forms part of the Wollstonecraft Conservation Area. There is a local heritage item of a precast concrete 'Wollstonecraft' station sign on the Platform 2 (refer to Section 6.5 for further details on local heritage).

There are sandstone rock cuttings in the southern area of the station in the vicinity of the Shirley Road Overbridge. The rock cuttings are not prominent visual features due to screening by existing vegetation and a row of large format advertising billboards, located to the southwest of the station.

Figure 6-2 details the landscape and visual features of the Proposal.

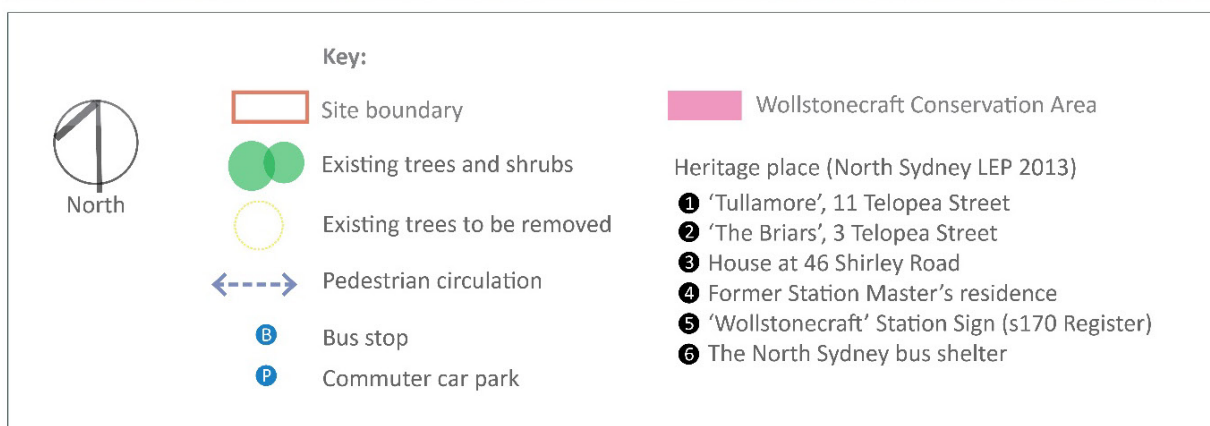
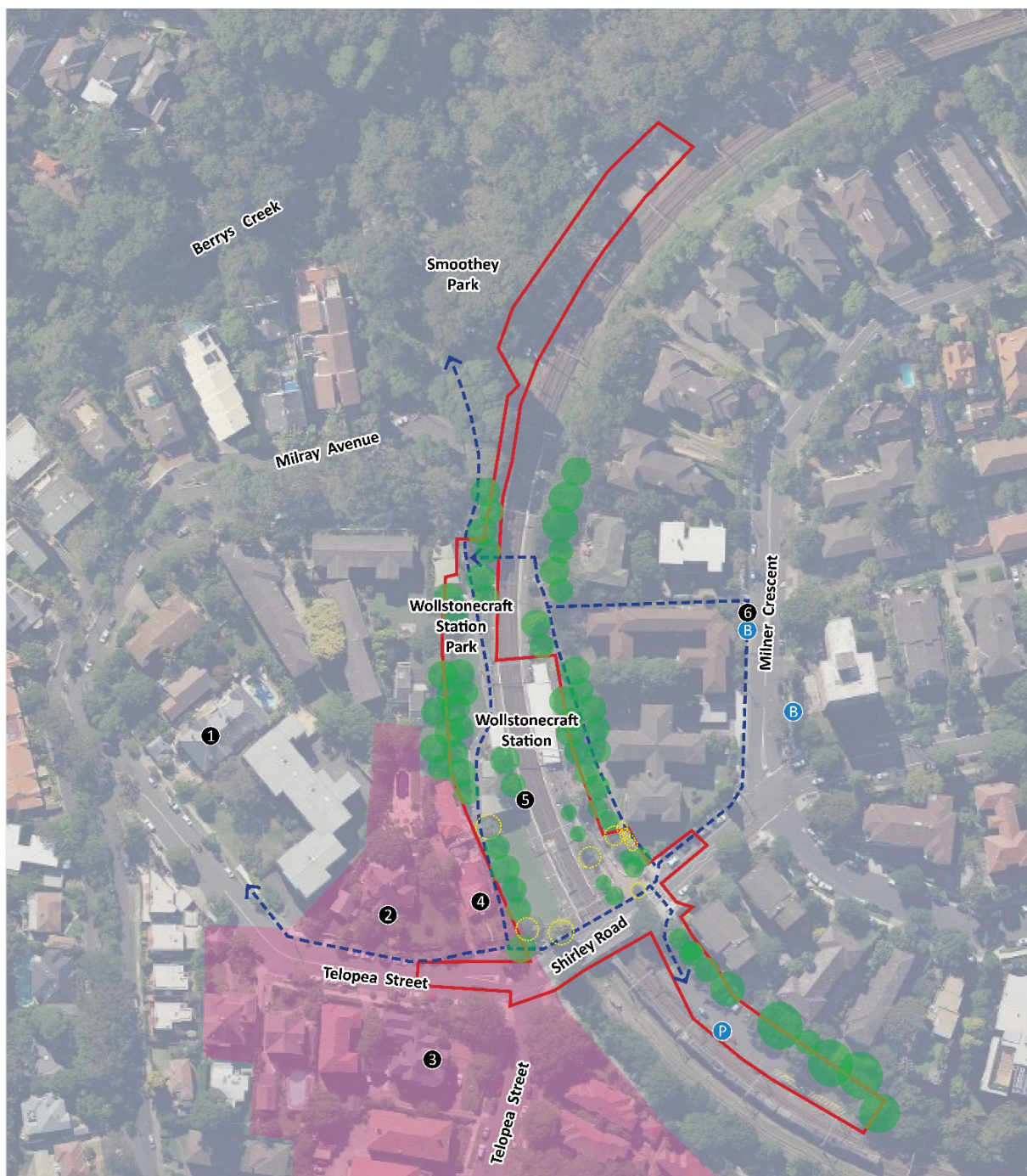


Figure 6-2 Landscape and visual features

Key viewpoints

There are eight viewpoints identified for the Proposal as identified shown in Figure 6-3 which include the following:

- Viewpoint 1: view north from Shirley Road, southeast of the station
- Viewpoint 2: view south from the Shirley Road Overbridge
- Viewpoint 3: view north from the Shirley Road Overbridge
- Viewpoint 4: view north from Shirley Road, southwest of the station
- Viewpoint 5: view southeast from Wollstonecraft Station Park
- Viewpoint 6: view south from Platform 1
- Viewpoint 7: view southwest from Platform 1
- Viewpoint 8: view east from Milray Avenue.

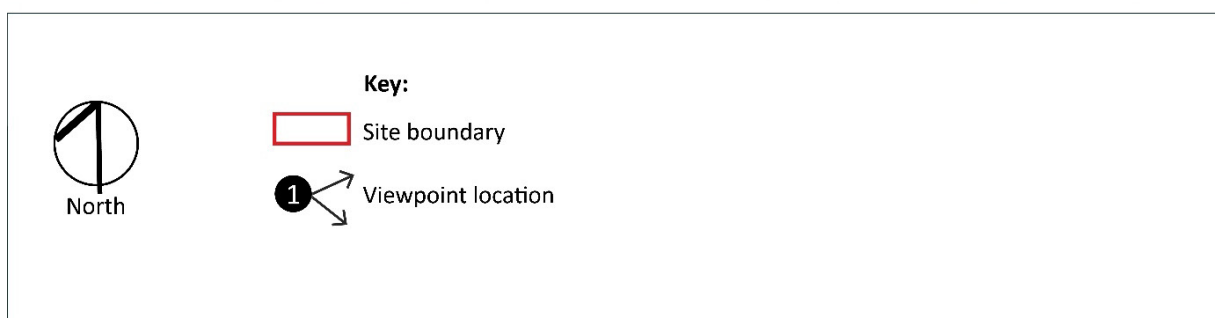


Figure 6-3 Viewpoint locations

The following viewpoints were selected as representative of the range of views to the site and the Proposal and are described in Table 6-1.

Table 6-1 Viewpoint locations summary

Viewpoint	Existing View	Sensitivity ¹
<u>Viewpoint 1</u> view north from Shirley Road, southeast of the station	<p>From Shirley Road, the station is mostly out of view as its located descending down the pathway with vegetation along the rail corridor and in adjacent properties. Primary view includes the small station entry plaza including the following:</p> <ul style="list-style-type: none"> • brick signage wall (left of view) • seating • ornamental gardens • feature palm tree plantings • pedestrian crossing connecting the station to the commuter car park. <p>Refer to Figure 6-4.</p>	Local
<u>Viewpoint 2</u> view south from the Shirley Road Overbridge	<p>Primary view is the existing commuter car park and rail corridor. The commuter car park view includes the following:</p> <ul style="list-style-type: none"> • located below the street level • surrounded by a black fence • mature trees and vegetation along the rail corridor and in private gardens overhanging <p>Refer to Figure 6-5.</p>	Local
<u>Viewpoint 3</u> view north from the Shirley Road Overbridge	<p>Station is set within a well vegetated setting that enclose and create a backdrop for the station. Views of rail cuttings are largely screened by vegetation with several ornamental trees. Other components in view also include the following:</p> <ul style="list-style-type: none"> • flat lawn area visible in the foreground alongside Platform 2 (left of view) • station platforms to the station buildings • southern end of the retail building • upper level of residential apartments. <p>Refer to Figure 6-6.</p>	Local
<u>Viewpoint 4</u> view north from Shirley Road, southwest of the station	<p>Station is located in the centre background and set below street level from Shirley Road and largely screened by a fence and vegetation. Views from this viewpoint include the following:</p> <ul style="list-style-type: none"> • upper part and central part of the station building on Platform 1 • entry wall • garden area • narrow pathway • former Station Master's Residence. <p>Refer to Figure 6-7.</p>	Local

Viewpoint	Existing View	Sensitivity ¹
<u>Viewpoint 5</u> view southeast from Wollstonecraft Station Park	<p>Station is visible at descending pathway from Shirley Road with vegetation along the eastern boundary of the rail corridor and several large Canary Island date palms. Other components in this viewpoint include the following:</p> <ul style="list-style-type: none"> • two-single story retail buildings • Platform 2 • residential apartments in the background <p>Refer to Figure 6-8.</p>	Local
<u>Viewpoint 6</u> view south from Platform 1	<p>Primary views are the station elements of the platforms and trains operating along the track. Trees and shrubs align the edges of the platforms with mature vegetation screening views to and from the adjacent residential areas. Other components within this view include the following:</p> <ul style="list-style-type: none"> • vertical rail elements of fences, light poles and overhead line masts along the rail corridor • modern low-set brick station buildings • advertising billboards • heritage listed 'Wollstonecraft' station sign • footpath leading to retail properties along Platform 2. <p>Refer to Figure 6-9.</p>	Local
<u>Viewpoint 7</u> view southwest from Platform 1	<p>Primary views are the station elements of the platforms and trains operating along the track. Mature trees along Platform 2 screen adjacent residences and station retail building. Other items within this view include the following:</p> <ul style="list-style-type: none"> • sandstone cutting rock • lawn area alongside Platform 2 • row of advertising billboards • heritage listed 'Wollstonecraft' station sign <p>Refer to Figure 6-10.</p>	Local
<u>Viewpoint 8</u> view east from Milray Avenue	<p>This view from a narrow residential street shows the mature vegetation within the Smoothey Park and footpaths leading to Berrys Creek in the north (left of view).</p> <p>The landform rises steeply towards the rail corridor, which is in the background of this view, elevated above street level. The existing mature trees filter views to the rail corridor and trains.</p> <p>Refer to Figure 6-11.</p>	Local

¹Local = high quality view experienced by concentrations of residents and/or local recreational users, local commercial areas, and/or large numbers of road or rail users, e.g. view from a conservation area or local park such as Wollstonecraft Station Park at the Station.



Figure 6-4 Viewpoint 1 – view north from Shirley Road, southeast of the station



Figure 6-5 Viewpoint 2 – view south from the Shirley Road Overbridge



Figure 6-6 Viewpoint 3 – view north from the Shirley Road Overbridge



Figure 6-7 Viewpoint 4 – view north from Shirley Road, southwest of the station



Figure 6-8 Viewpoint 5 – view southeast from Wollstonecraft Station Park



Figure 6-9 Viewpoint 6 – view south from Platform 1



Figure 6-10 Viewpoint 7 – view southwest from Platform 1



Figure 6-11 Viewpoint 8 – view east from Milray Avenue

6.2.2. Potential impacts

a) Construction phase

Views during daytime

Table 6-2 summarises construction impacts assessed at each of the representative viewpoint locations.

Table 6-2 Assessment of visual impacts during construction of the Proposal

Viewpoint	Assessment of visual impact	Sensitivity ¹	Magnitude ²	Impact rating
<u>Viewpoint 1</u> view north from Shirley Road, southeast of the station	The Proposal would have the following visual impacts: <ul style="list-style-type: none"> • construction works to install the eastern lift structure, footpaths and ramps • earthworks excavation of the rock embankment for the lift structure • removal of trees and vegetation along rail cutting • construction works for an AusGrid electrical transformer including removal of trees, excavation and rock breaking activities • minor works on the overbridge including pathway regrading, resurfacing and installation of pedestrian handrails. 	Local	Considerable reduction	Moderate adverse
<u>Viewpoint 2</u> view south from the Shirley Road Overbridge	The Proposal would have the following visual impacts: <ul style="list-style-type: none"> • construction views of commuter car park used as a compound including construction activities and equipment • minor works along the overbridge including kerb realignment and installation of new handrails. 	Local	Minor reduction	Minor adverse
<u>Viewpoint 3</u> view north from the Shirley Road Overbridge	The Proposal would have the following visual impacts: <ul style="list-style-type: none"> • installation of the lifts on both Platform 1 and 2 • lift construction activities including excavation and vegetation removal on Platform 1 • view of construction activities and equipment • removal of vegetation and trees for an AusGrid electrical transformer, lifts and accessible path • construction of mains switch room • minor construction work for platform upgrade works including regrading, installation of TGSIs and safety lines. 	Local	Considerable reduction	Moderate adverse

Viewpoint	Assessment of visual impact	Sensitivity ¹	Magnitude ²	Impact rating
<u>Viewpoint 4</u> view north from Shirley Road, southwest of the station	The Proposal would have the following visual impacts: <ul style="list-style-type: none"> removal of trees along the rail cutting for installation of Platform 2 lift and new ramp construction of the ramp connecting to Shirley Road Overbridge to regraded footpath connecting to Platform 2 installation of lift at Platform 1. 	Local	Considerable reduction	Moderate adverse
<u>Viewpoint 5</u> view southeast from Wollstonecraft Station Park	The Proposal would have the following visual impacts: <ul style="list-style-type: none"> view of construction activities and equipment at the nominated compound located at this park 	Local	Considerable reduction	Moderate adverse
<u>Viewpoint 6</u> view south from Platform 1	The Proposal would have the following visual impacts: <ul style="list-style-type: none"> construction of the new sheltered waiting area to accommodate the boarding assistance zone on Platform 1, platform regrading and installation of TGSIs and safety lines view of construction compound of open lawn area including construction equipment and activities. 	Local	Considerable reduction	Moderate adverse
<u>Viewpoint 7</u> view southwest from Platform 1	The Proposal would have the following visual impacts: <ul style="list-style-type: none"> view of construction compound of open lawn area including construction equipment and activities construction of the new boarding assistance zone on Platform 2 upgrades to the overbridge including new handrails and ramp construction of the new main switch room at the southern end of Platform 1 station building platform work including stabilising and regrading works, installation of TGSIs and safety lines. 	Local	Considerable reduction	Moderate adverse
<u>Viewpoint 8</u> view east from Milray Avenue	The nominated compound area would be established beyond the vegetation on an area of cleared land within the rail corridor. Views of construction equipment and activities would be minimal through the vegetation.	Local	No perceived change	Negligible

¹Local = high quality view experienced by concentrations of residents and/or local recreational users, local commercial areas, and/or large numbers of road or rail users, e.g. view from a conservation area or local park such as Wollstonecraft Station Park at the Station.

²Magnitude describes the extent of change resulting from the Proposal and the compatibility of these new elements with the surrounding landscape.

In summary, the following are visual impact assessments during construction:

- views from the station platforms and approach to the station from Shirley Road and Wollstonecraft Station Park would have moderate adverse visual impacts due to scale and extent of the works
- views from the south of Shirley Road Overbridge would be minor adverse visual impacts due to the construction compound enclosed by existing mature vegetation and below the road level and main view line
- views from Milray Avenue and adjacent residential and parkland areas would have negligible visual impacts as the construction compound would be screened by existing mature vegetation
- views from residential properties directly adjacent to the station would have minor to moderate adverse visual impacts as some construction work is seen through intervening vegetation and removal of trees.

Views at night

The Proposal is defined to have moderate district brightness from the combination of relatively high light levels within the station, moderate light levels along Shirley road and lower light levels in the surrounding residential areas. The brightly lit environment of the station is mostly contained by surrounding landform and vegetation.

Lighting impacts at night from the Proposal may include the following:

- reduced screening of the station lighting due to the vegetation and tree removal particularly to accommodate the installation of the AusGrid electrical transformer
- emitted light toward the surrounding streets and residential properties are partly screened by a densely vegetated setting
- character of the construction works at the lift work areas and construction compound areas at night would be absorbed into the surrounding brightly lit environment of the station and enclosed by the existing vegetation which surround the station
- some lighting visible from elevated residential properties which overlook the site, where the removal of existing trees opens up views into the station
- work areas and construction compounds would be lit for security and not likely to be an ongoing basis (other than for specific activities undertaken during rail possession periods).

Overall, the works would result in a minor reduction in the amenity of views at night and a minor adverse visual impact during construction. In summary, visual impacts during construction as identified and described would be temporary and short-term.

Urban design and landscape character

There would be a temporary, minor reduction in the landscape and urban design functionality of the station precinct resulting in a minor adverse landscape impact during construction due to the following:

- access to the playground and parkland areas of Wollstonecraft Station Park would be maintained
- reduction of car parking at commuter car parking
- modification of the landform for rock cutting and installation of an AusGrid electrical transformer along with tree and vegetation removal
- temporary pedestrian access arrangement and footpath diversions with potential reduced amenity and comfort for pedestrians.

b) Operation phase

Views during daytime

Table 6-3 summarises the daytime operational impacts assessed at each of the representative viewpoint locations.

Table 6-3 Assessment of visual impacts during operation of the Proposal

Viewpoint	Assessment of visual impact	Sensitivity ¹	Magnitude ²	Impact rating
<u>Viewpoint 1</u> view north from Shirley Road, southeast of the station	<p>The Proposal would have a noticeable reduction in the amenity of this view due to the following:</p> <ul style="list-style-type: none"> new Platform 1 lift would rise above the existing backdrop of vegetation but lower than adjacent apartment buildings station entry to include more built form and less leafy elements removed vegetation and trees for the AusGrid electrical transformer new Platform 2 lift in the distant view. <p>Refer to Figure 6-12.</p>	Local	Minor reduction in amenity	Minor adverse
<u>Viewpoint 2</u> view south from the Shirley Road Overbridge	<p>There is no expected change in the amenity of this view as the commuter car park would be reinstated and upgrades along the overbridge are minor.</p>	Local	No change in amenity	Negligible
<u>Viewpoint 3</u> view north from the Shirley Road Overbridge	<p>The Proposal would have a minor reduction in the amenity of this view due to the following:</p> <ul style="list-style-type: none"> new Platform 1 and 2 lift structures expanded station building on Platform 1 for main switch room reduction of leafy backdrop due to removal of vegetation and trees. <p>Refer to Figure 6-13 and Figure 6-14.</p>	Local	Minor reduction in amenity	Minor adverse
<u>Viewpoint 4</u> view north from Shirley Road, southwest of the station	<p>The Proposal would have a minor improvement in the amenity of this view due to the following:</p> <ul style="list-style-type: none"> new ramp, footpaths and landscaping glimpses of the new Platform 2 lift through filtered retained trees opening up views to the station building with visual prominence due to removed vegetation and increased built forms. <p>Refer to Figure 6-15.</p>	Local	No change in amenity	Negligible

Viewpoint	Assessment of visual impact	Sensitivity ¹	Magnitude ²	Impact rating
<u>Viewpoint 5</u> view southeast from Wollstonecraft Station Park	There is no expected change in the amenity of this view as the Wollstonecraft Station Park would be reinstated and no further work would be required. Views of the lift would be absorbed into the background of this view.	Local	No change in amenity	Negligible
<u>Viewpoint 6</u> view south from Platform 1	There is no expected change in the amenity of this view as the proposed works are minor including a new sheltered waiting area and, in the distance, new ramp and landscaped areas.	Local	No change in amenity	Negligible
<u>Viewpoint 7</u> view southwest from Platform 1	There is no expected change in the amenity of this view as most of the built elements would be part of the background or partially screened by vegetation and trees. The prominent structure in view would be the new canopy structure and retained Wollstonecraft Station sign.	Local	No change in amenity	Negligible
<u>Viewpoint 8</u> view east from Milray Avenue	There is no change in the amenity of this view as the site would be reinstated and have no new elements.	Local	No perceived change	Negligible

¹Local = high quality view experienced by concentrations of residents and/or local recreational users, local commercial areas, and/or large numbers of road or rail users, e.g. view from a conservation area or local park such as Wollstonecraft Station Park at the Station.

²Magnitude describes the extent of change resulting from the Proposal and the compatibility of these new elements with the surrounding landscape.

In summary, the following are visual impact assessments during operation:

- views from Shirley Road at the overbridge and eastern entrance would have minor adverse visual impacts as new station buildings would be seen
- views from the viewpoints two through eight would have negligible visual impacts as the proposal features (e.g. lift structures) absorb into the existing station character and are screened by existing vegetation, landform or buildings

Views at night

The station would be likely to create minor additional sky glow above the site due to the additional built form. There is not expected to be any additional direct light spill onto private property to the east of the station as the neighbouring residential properties are separated from the station by existing vegetation.

Generally, the proposed station upgrade at night would be visually absorbed into the surrounding brightly lit environment.

There are no negligible visual impacts at night during operation.

Urban design and landscape character

During operations, there would be a minor improvement in the urban design and landscape character of the Wollstonecraft Station due to the following:

- upgrade of the station including new lifts, modified overbridge, station entrance, accessible kiss and ride bay and improvements to the platform surface
- improved legibility within the station precinct through increased visual prominence of the station entry on Shirley Road.



Figure 6-12 Photomontage from viewpoint 1: view north from Shirley Road, southeast of the station



Figure 6-13 Photomontage view from Platform 2 looking toward Platform 1



Figure 6-14 Photomontage from viewpoint 3: view north from the Shirley Road Overbridge



Figure 6-15 Photomontage from viewpoint 4: view north from Shirley Road, southwest of the station

6.2.3. Mitigation measures

The full list of mitigation measures for potential landscape and visual amenity impacts are described in Table 7-1 in Section 7.2. The following are a summary of site-specific mitigation measures recommended for this Proposal:

- opportunities to minimise the visual impact of the AusGrid electrical transformer including:
 - minimising the area of hardstand surrounding the transformer
 - locating the transformer to avoid the removal of the existing vegetation which screens the adjacent residential properties
 - providing screening vegetation to limit views to the transformer particularly from adjacent residences and Shirley Road

6.3. Noise and vibration

This section provides a summary of the *Noise and Vibration Impact Assessment* prepared by WSP (2020) and which is attached as Technical Paper 3. The assessment included the following tasks:

- assessing existing noise levels with unattended and operator attended noise surveys at identified noise monitoring locations
- identification of assessment methods per the *Transport for NSW Construction Noise and Vibration Strategy* for construction noise impacts at sensitive receivers
- definition of construction and operation noise management levels during identified periods.

6.3.1. Existing environment

The existing noise environment in the vicinity of Wollstonecraft Station is primarily characterised by existing train service from rail traffic noise and light vehicles around the neighbourhood.

Sensitive receivers

Receivers potentially sensitive to both noise and vibration in the following categories as defined in *Noise Policy for Industry* (NPfI) (EPA, 2017) and *Interim Construction Noise Guideline* (ICNG) (DECC, 2009) have been identified in the surrounding area:

- residential located east and west of the station
- non-residential including passive recreational areas, commercial and family centre
- vibration sensitive receivers including the Wollstonecraft Station signage, Wollstonecraft Conservation Area and North Sydney bus shelter.

Representative sensitive receivers are outlined in Table 6-4 with accompanying survey method and related noise catchment area as shown in Figure 6-16.

Table 6-4 Noise catchment areas and classification of representative receivers

NCA	Receiver Type (ID)	Address	Distance to Proposal (M) ¹
1	Residential (RES1)	45-47 Milray Ave, Wollstonecraft	20
	Passive Recreation (PR1)	Wollstonecraft Station Park	5
	Commercial (COM1)	Wollstonecraft Café	5
	Hospital (HOS1)	Tresillian Child Care Centre	110
2	Residential (RES2)	2 Milner Cres, Wollstonecraft	15
	Residential (RES3)	50 Shirley Rd	10
	Commercial (COM2)	Wollstonecraft Shop and Laundromat	5

¹Minimum distance of the sensitive receiver to the limits of the construction footprint.



Figure 6-16 Site overview and NCA locations

Background noise levels

Background and ambient noise levels were determined through a combination of unattended and attended noise surveys. Two noise monitoring locations (NM01 and NM02) were used to characterise the existing noise environment at representative residential receivers on either side of the station, and allocated NCAs.

Unattended noise survey results at NM01 and NM02 were 42dBA and 40dBA respectively during the day. In both locations, noise levels were found to reduce during the evening and night periods. Dominant noise sources were associated with train passbys and urban hum. The results of the unattended noise surveys are detailed in Table 6-5.

Table 6-5 Background noise levels

Location	Rating background level (RBL) dBA ¹			Ambient noise levels LEQ dBA ²		
	Day ³	Evening ³	Night ³	Day ³	Evening ³	Night ³
NM01	42	(42) ⁴	(42) ⁴	55	56	52
NM02	40	(40) ⁴	(40) ⁴	52	51	47

¹Rating Background Level (RBL), the 10th percentile min L_{A90} noise level recorded over all day, evening and night time monitoring periods.

²Ambient noise levels: the overall noise level over each assessment period (daytime/evening/night-time) as defined in the NPfI and ICNG.

³Time periods defined as – Day: 7am to 6pm Monday to Saturday, 8am to 6pm Sunday; Evening: 6pm to 10pm; Night: 10pm to 7am Monday to Saturday, 10pm to 8am Sunday.

⁴Due to the technical fault with the loggers, the RBLs for evening and night were not accurately reported. Results used for this assessment included historical monitoring background noise levels and industry adopted guidelines. Section 2.4.1 of Technical Paper 3 details this discussion on noise monitoring data used for this assessment.

The attended noise surveys and observations are characterised by urban noise sources with ambient noise levels from train passbys, birds and insects, buses and plane passbys. The results of the attended noise surveys are detailed in Table 6-6.

Table 6-6 Summary of attended noise measurement results

Location	Time	dBA L _{eq} (15min)	dBA L ₉₀ (15min)	Observations ¹
NM01	12:00pm – 12:15pm	57	38	Cicadas: 48dBA Insects: 53dBA Train approach (SB/NB): 61dBA / 69dBA Train idle: ~54dBA
	10:05pm – 10:20pm	45	32	Train approach: 45–50dBA Car passbys: 50dBA Typical background: 32–35dBA
NM02	1:00pm – 1:15pm	52	41	Insects: 43dBA Birds: 44dBA Airplane passby: 44dBA Train approach: 65dBA Train departure: 57dBA Bus passbys: 74dBA
	10:26pm – 10:41pm	45	31	Distant traffic: 40dBA Distant helicopter: 35–40dBA Typical background: 33dBA

¹maximum sound measured

The results of the attended noise survey are consistent with the results of the unattended noise monitoring with RBLs during the daytime period of 38dBA and 41dBA at NM01 and NM02 consistent with the results of the unattended monitoring. Night time RBLs are in the order of 32dBA at this location, which is largely consistent with the findings of this investigation.

It is noted that the background is impacted by changes in traffic flows and ambient noise influences due to COVID restrictions, however these values indicate that even during atypically quiet background conditions, noise levels were not observed to be lower than 30dBA.

6.3.2. Noise assessment criteria

Refer to Chapter 3 of *Technical Paper 3 – Noise and Vibration Impact Assessment* for detailed noise and vibration assessment criteria.

6.3.3. Potential impacts

a) Construction phase

Predicted noise levels

A number of activities were considered as part of the construction noise and vibration assessment. Table 3-1 provides a list of the activities and details the works that would be completed during each activity and the timing of each activity.

Scenarios assessed for this Proposal include the following:

- **Scenario 1** – Site establishment and enabling works
- **Scenario 2** – Lift work
- **Scenario 3** – Ramp upgrade
- **Scenario 4** – Kiss and Ride and accessible car parking space
- **Scenario 5** – Shirley Road Overbridge work
- **Scenario 6** – Station building works
- **Scenario 7** – Platform stabilisation and upgrade work
- **Scenario 8** – Demobilisation.

Table 6-7 presents the predicted noise levels for the representative receivers for the key construction work activities. Table 6-8 presents the predicted sleep disturbance noise impacts for residences only.

The calculations are conservative as they include all equipment operating simultaneously at their closest point to the receiver in a worst case 15-minute period. Actual noise levels from the construction site would be expected to be lower. Where a predicted noise level exceeds a less stringent management level (SH), it follows that the more stringent (OOH) management levels are also exceeded.

It is noted that a number of the scenarios incorporate plant with annoying acoustic characteristics, which have resulted in the application of a noise penalty. This includes plant such as chainsaws, concrete saws. It is highly unlikely that these items of equipment will be fully utilised during works, and where not used noise levels will be notably decreased in their impact to receivers.

During outside standard hours and where equipment with annoying acoustic characteristics are in use, exceedances of relevant noise levels are notably above management levels, as a result it is recommended that works involving this equipment be strictly limited to standard hours where possible.

Table 6-7 Maximum predicted construction noise levels and indicative exceedances per scenario

NCA	Receiver Type (ID)	NML, dBA L _{eq} (15min) ^{1,2}				Modelled Maximum Noise level per scenario, dBA L _{eq} (15min) ^{2,3,4}							
		SH	OOH	OOH 3	HNA	S01	S02	S03	S04	S05	S06	S07	S08
1	Residential (RES1)	52	45	40	75	81 (83)	73 (75)	77 (80)	67 (69)	70 (72)	82 (86)	83 (87)	81 (81)
	Active recreation (AR1)	60	N/A	N/A	N/A	87 (89)	69 (72)	77 (80)	67 (69)	66 (68)	79 (84)	88 (>90)	87 (87)
	Commercial (COM1)	70	N/A	N/A	N/A	>90 (>90)	80 (83)	83 (86)	73 (76)	75 (77)	>90 (>90)	>90 (>90)	>90 (>90)
	Hospital (HOS1)	55	55	55	75	66 (68)	68 (71)	65 (68)	61 (64)	65 (67)	62 (66)	60 (64)	66 (66)
2	Residential (RES2)	50	45	40	75	81 (83)	72 (75)	83 (86)	68 (71)	62 (64)	80 (84)	80 (85)	81 (81)
	Residential (RES3)	50	45	40	75	84 (87)	86 (88)	82 (85)	69 (71)	79 (81)	79 (83)	81 (86)	84 (84)
	Commercial (COM2)	70	N/A	N/A	N/A	>90 (>90)	74 (77)	82 (86)	68 (70)	70 (72)	>90 (>90)	>90 (>90)	>90 (>90)

orange shaded cells = exceedances of the standard-hours day period **Red text** = exceedances of highly noise affected NMLs

¹Time periods as defined in Table 6-5, HNA – Highly noise affected

²Predicted noise levels are represented by a single point for each receiver type and noise catchment area for this preliminary assessment

³Where a predicted noise level exceeds a less stringent management level (SH), it follows that the more stringent (OOH) management levels are also exceeded. OOH activities are SC02, SC04 and SC05 only.

⁴Values in brackets indicate predicted noise levels excluding plant items with special audible characteristics (concrete saw, chainsaw)

Assessment of predicted noise levels

Standard hours

The majority of construction activities are proposed to occur during standard hours. The assessment of construction noise impacts at the nearest sensitive receivers indicates that noise levels are predicted to exceed relevant NMLs at the nearest sensitive receivers in NCA01 and NCA02 during all activities, with Scenarios 3 and 7 presenting the greatest impact to sensitive receivers as shown in Table 6-7.

Noise levels are predicted to result in exceedances of the standard hours criteria during Scenarios 1, 7 (at NCA1) and 8 due to the close proximity of residential buildings overlooking the boundary of the construction works areas, particularly in Milner Crescent. Exceedances of up to 36dBA are predicted at residences in NCA02 during Scenarios 1, 2 and 8. The closest residences to the construction works are predicted to be highly noise affected when works are at their closest, particularly in NCA02.

Exceedances of relevant criteria are predicted in the passive recreation areas adjacent the proposal in NCA01 during all scenarios, with exceedances up to 27dBA predicted during Scenarios 1 and 8, and 28dB during Scenario 7.

For the nearest commercial receivers, noise levels are predicted to exceed relevant criteria in NCA01 and NCA02 for all scenarios, with exceedances up to 30dBA above criteria for Scenarios 1, 6, 7 and 8.

The Tresillian child care centre in NCA01 is predicted to experience noise levels above relevant criteria for all scenarios, with exceedances of up to 13dBA in Scenario 2; exceedances for remaining scenarios are in the order of 5 to 11dBA. Levels assume noisiest plant operating at the closest offset to the receiver, however when high intensity works such as concrete saws, jackhammers or drills are not operational, noise levels would be expected to reduce by 3dB. Noise levels are expected to remain below relevant management levels for the majority of the works during standard hours when mitigation measures are in place and considering the spatial distribution of noise sources.

Noise impacts would be noticeable at the nearest receivers to the work areas like Scenarios 1 and 8 include construction compound access, which are located adjacent some residences. It is noted that activities such as Scenario 1, 4 and Scenario 8 will be of relatively short duration (in the order of several days or weeks). Additionally, noise impacts from the use of the construction compounds will be similar to those for Scenario 1 and 8; however, will likely only occur for short periods of one hour each morning and afternoon.

The impacts associated with standard hours works during Scenario 2 and Scenario 5 are likely to occur intermittently over a 10-month period and are predicted to result in noticeable noise impacts at the nearest receivers in all NCAs. Scenario 3 works are anticipated to occur intermittently over a 14-month period and are predicted to result in noise impacts at in most NCAs. Scenario 6 activities are anticipated to occur over a period of 8 months, generally within the rail possession periods and will generate notable impacts at receivers. Scenario 7 activities are anticipated to occur over a period of 13 months, generally within standard hours and will generate notable impacts at receivers.

While noise levels are considered to be noticeable and intrusive when works are at their nearest to receivers, the use of high intensity plant such as concrete saws, jackhammers or drills is not expected to be continuous. Where these plant are not operational, noise levels would be expected to reduce by 3dB. As a result of the predicted exceedances, noise mitigation and management measures have been outlined in Chapter 7 to reduce the potential noise impacts.

Outside standard hours

Out of hours works are proposed during all construction scenarios, including during rail possession, with the exception of Scenario 8. The assessment of OOH construction noise impacts at residential receivers indicates that noise levels are predicted to exceed relevant NMLs at the nearest sensitive receivers in NCA01 and NCA02 during all activities, with Scenarios 3, 6 and 7 presenting the greatest impact to sensitive receivers, and Scenarios 1 and 8 due to the proximity of construction compounds to residences.

Noise levels are predicted to result in exceedances of the OOH criteria by up to 38dBA during Scenarios 1, 6, 7 and 8 at residences in NCA01. Exceedances of up to 41dBA and 39dBA are predicted at residences in NCA02 during Scenario 2 and Scenario 8.

The Tresillian child care centre in NCA01 is predicted to experience noise levels above relevant criteria for all scenarios as it operates during standard and outside standard hours. The exceedances are up to 13dBA in Scenario 2 and exceedances for remaining scenarios are in the order of 5 to 11dBA. Where high intensity works such as concrete saws, jackhammers or drills are not operational, noise levels would be expected to reduce by 3dB. Noise levels will exceed OOH management levels for the majority of the works.

Out of hours works would take place during rail possessions (typically occurring over a weekend) with up to five rail possessions expected to occur over the duration of the proposal (i.e. up to around 18 months). Other works may also be required to occur outside of standard hours which are not part of rail possessions.

Noise impacts would be noticeable outside standard hours at the nearest receivers to the works areas; Scenarios 1 and 8 include construction compound access, which are located adjacent some residences. It is noted that activities such as Scenario 1 and Scenario 4 and Scenario 8 will be of relatively short duration (in the order of several days or weeks).

The impacts associated with OOH works during Scenario 2 and Scenario 5 are likely to occur intermittently over a 10-month period and are predicted to result in noticeable noise impacts at the nearest receivers in all NCAs. Scenario 3 works are anticipated to occur intermittently over a 14-month period and are predicted to result in noise impacts at in most NCAs. Scenario 6 activities are anticipated to occur over a period of 8 months, generally within the rail possession periods and will generate notable impacts at receivers. SC07 activities are anticipated to occur over a period of 13 months, generally within standard hours and will generate notable impacts at receivers.

As a result of the predicted exceedances during OOH, further noise mitigation and management measures would be required in the event of OOH works being undertaken, and an overview has been outlined in Chapter 7 to reduce the potential noise impacts for consideration.

Table 6-8 Predicted sleep disturbance noise impacts (residences only)

NCA	Receiver Type (ID)	NML, dBA $L_{eq(15min)}$ ^{1,2}		Modelled Maximum Noise level per scenario, dBA $L_{eq(15min)}$ ²						
		RNP screening criterion	RNP Awakening goal	S01	S02	S03	S04	S05	S06	S07
1	Residential (RES1)	52	65	81 (87)	75 (78)	77 (84)	68 (73)	71 (71)	82 (>90)	87 (88)
	Hospital (HOS1)	52	65	66 (72)	70 (74)	65 (72)	62 (68)	66 (66)	62 (70)	64 (65)
2	Residential (RES2)	52	65	81 (87)	74 (78)	83 (>90)	69 (75)	63 (63)	80 (88)	85 (86)
	Residential (RES3)	52	65	84 (90)	88 (>90)	82 (89)	70 (75)	80 (80)	79 (87)	85 (86)

blue shaded cells show exceedances L_{max} and $L_{eq(15min)}$ criteria grey shaded cells show exceedances of the $L_{eq(15min)}$ criteria

¹Sleep disturbance criteria applicable to residential / hospital receivers only.

²Predicted noise levels are represented by a single point for each receiver type and noise catchment area for this preliminary assessment

Sleep disturbance

The predicted maximum noise levels calculated in Table 6-8 indicate that sleep disturbance for residential receivers is likely to occur at receivers adjacent to the construction footprints. Noise levels are predicted to result in exceedances of both the RNP screening criteria and the awakening goal.

The potential for work to generate maximum noise level events should be considered as part of the construction noise management plan for the works. Mitigation measures are discussed further in Chapter 7.

Construction traffic noise

Noise levels generated by construction vehicles are anticipated to comply with relevant road noise criteria during the day period, with notable impacts anticipated during the night time period and during possessions. As a result, mitigation and measures are recommended, which should be outlined in a Traffic Management Plan for the proposal. It is recommended that heavy vehicle movements to and from the site be restricted to standard (daytime) hours where feasible. Other mitigation measures are presented in Chapter 7.

It is anticipated that traffic management will be required on Shirley Road involving closure of one lane for residential traffic. Management of these impacts would be determined by the construction contractor during detailed design.

Vibration

Certain construction activities would require the use of vibration intensive equipment that may affect the nearest sensitive receivers. The vibration intensive plant nominated as part of the work is piling rig (bored), vibratory roller and jackhammer during scenarios 2 through 6.

Minimum working distances for vibration intensive plant have been outlined in Table 4.6 in *Technical Paper 3 – Noise and Vibration Impact Assessment* to comply with human comfort and cosmetic damage vibration limits.

Given the distances and potential work areas of vibratory intensive plant, sensitive receivers in NCA01 and NCA02 that are not associated with the station itself are generally anticipated to be located outside the safe working distance limits for cosmetic damage and human response, therefore no further action is required. However where compaction or vibratory rolling works in are located within the safe working distances, further management and mitigation measures are required as discussed in Chapter 7, particularly with regard to the commercial receivers adjacent the works site.

If minimum working distances are complied with, no adverse impacts are expected for cosmetic damage or human response on nearby sensitive receivers. If works occur within these minimum working distances, mitigation measures outlined in Section 7.2 would be applied.

b) Operation phase

The operation of Wollstonecraft Station would remain unchanged as a result of the Proposal. There would be no expected changes to the operation of the rail network. New plant and equipment associated with the upgrade to the station include two new lifts and upgrade of toilets for internal station building work.

No operational impacts would be expected as mechanical noise emissions from the new lifts would not have a significant impact on the surrounding environment, and that the use of standard controls such as quiet plant selection, and duct lining and/or attenuators, would allow mechanical plant noise to be reduced to acceptable levels.

6.3.4. Mitigation measures

The full list of mitigation measures are described in Table 7-1 in Section 7.2. The following are a summary of site specific mitigation measures recommended for this Proposal:

- during site establishment (Scenario 1), temporary barriers should be erected to ensure that work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of sensitive receivers to ensure that 'line of sight' is broken, where feasible. This has the potential to reduce noise levels between 5 and 10dB
- during Scenarios 1 to 6, use of the concrete saw and/or chainsaw is the main contributor to construction noise. Both the chainsaw and concrete saw are particularly loud construction plant items which produces a noise the CNVS identifies as having 'special audible characteristics' and incurs a +5dB penalty
- without the concrete saw and chainsaw, the total activity noise level is reduced by 8–10dB. It is recommended that the use of these plant items is limited where possible, and works are limited to standard hours as far as possible, and outside sensitive time periods (particularly with regard to the Tresillian centre). Where work is required outside of standard hours, the use of this equipment is to avoid sensitive periods such as after midnight and before 7.00am
- due to the high exceedances of NMLs during Scenarios 2 to 6, when a concrete saw is to be used near sensitive receivers it is recommended that a temporary screen or enclosure (10–15dB reduction) is placed around the works in conjunction with temporary barriers

- the Tresillian centre is likely to be more sensitive during certain times of the day, such as when the sleep clinic is in use. Therefore, it is recommended that consultation be undertaken with the Tresillian centre to determine feasible construction staging to manage impacts, effectively communicate likely impacts, potential periods of high intensity works, and to develop a schedule of consultation to program intensive works outside the most sensitive night time periods. Respite periods should be negotiated and a community consultation strategy developed to ensure a complaints hotline and feedback pathway is established
- noise intensive construction works near the Tresillian centre is to be minimised as far as reasonably possible. It is also recommended that where reasonable and feasible the use of the concrete saw is limited to standard hours or when the premises are not in use as a sleep clinic (e.g. between 7.00am and 9.00am, and 5.00pm and 6.00pm), to minimise the impact on this receiver
- a traffic management plan is to be prepared to manage construction noise impacts, particularly during rail possessions. This should include speed limits and circulation recommendations, measures to promote one-way traffic.

6.4. Indigenous heritage

A search for known Aboriginal heritage items in the vicinity of Wollstonecraft Station (plus a 200 metre buffer) was undertaken on 13 March 2020 using the Aboriginal Heritage Information Management System (AHIMS) database.

6.4.1. Existing environment

The AHIMS search identified one known Aboriginal site and no Aboriginal heritage places or close to Wollstonecraft Station. The Aboriginal site was not detailed in the Basic Search but is identified as more than 500 metres away.

The extensive landscape modification and developed surrounding area around the Proposal, suggests that intact evidence of Aboriginal land use is unlikely to occur.

6.4.2. Potential impacts

a) Construction phase

Construction of the Proposal would involve some minor excavation and other ground disturbance activities for the foundation and pits of the two new lifts as well as excavation to rebuild and regrade Platform 1.

Ground disturbing activities have the potential to impact Aboriginal sites, if present, however given the substantial modification to the area as a result of the previous construction of the station, the likelihood of this is expected to be low.

b) Operation phase

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

6.4.3. Mitigation measures

Refer to Table 7-1 in Section 7.2 for a full list of proposed mitigation measures with respect to potential Aboriginal heritage impacts.

6.5. Non-Indigenous heritage

This section provides a summary of the *Statement of Heritage Impact* (SoHI) prepared by GML Heritage (April 2019) (Technical Paper 4). The assessment included the following tasks:

- review of Commonwealth and State Heritage legislation
- reference of methodology consistent with the *NSW Heritage Manual* guidelines, including 'Assessing Heritage Significance' and the Burra Charter
- site inspection to assess aspects of the identified heritage items with respect to the proposed works
- review of historical information from National Library of Australia, State Library of NSW and Transport for NSW
- impact assessment of the Proposal on heritage and applying associated mitigation measures as required.

6.5.1. Existing environment

Historical background

North Shore Rail Line and Wollstonecraft Station

The North Shore Rail Line was opened on 1 January in 1890 and originally extended as a single track from Hornsby to St Leonards and was the first suburban railway. Entering into the 1900s, the rail line was double tracked and duplicated along with rebuilding of stations with Federation-style brick buildings. Afterward during the early to mid-1900s, the rail line was upgraded to accommodate for electrification, wider carriages and double-deck trailer carriages.

Wollstonecraft Station, originally named Edwards Road, opened on 1 May 1893 during the extension of the North Shore Rail Line double track expansion. Access to this station was originally by a set of stairs from a footbridge over Shirley Road to each of the platforms. Around 1980, the station was re-developed and the original station buildings were demolished and replaced with the present brick station buildings on Platform 1 and 2.

Heritage landscape setting

The sandstone cutting, sandstone walling and landscaping surrounding the station contribute to the station's landscape setting. The rough sandstone walls of the cutting and the curve of the railway line and station platforms are an ever-present reminder of the rugged topography that the North Shore Line had to be cut through when it was built.

Listed heritage items

The desktop search of relevant non-Aboriginal heritage registers did not identify any heritage items listed on the World, Commonwealth or National Heritage Lists, the Register of the National Estate or State Heritage Register within proximity of the Proposal.

There are nine heritage items (State and local) identified within the vicinity of the Proposal and are summarised in Table 6-9. Two heritage items are noted either within or close proximity of the Proposal including the Wollstonecraft Conservation Area and the Wollstonecraft Railway Station Sign.

Wollstonecraft Conservation Area

The Wollstonecraft Conservation Area is located directly adjacent to the Proposal and is related to the Wollstonecraft Station Group's historic building connections from the 1960s to 1980s. It is listed on the *North Sydney Local Environmental Plan 2013*. This area is considered significant as it dictates its early 20th century history. This station also has other early platform (early twentieth century) structures including three brick drains running along the outer edges of the platforms, brick underpass, brick piers supporting the existing overbridge and sandstone cutting and stone walling adjacent to the Shirley Road.

The heritage landscaping on the upper area along the western side of the station, from the entrance to the Shirley Road Overbridge down to the shops is part of the heritage landscape. The gardens extend the landscape setting around the station.

Wollstonecraft Railway Station Signs

There are two Wollstonecraft Railway Station Signs comprising of two square tapered precast concrete posts containing asbestos containing material as shown in Figure 6-17. They are listed on the Sydney Trains Heritage and Conservation Register under Section 170 of the *Heritage Act 1977*. The boards have sloping ends and a capping at the top. The letters are approximately 30 centimetres high and fully capitalised with condensed sans serif lettering. The signs have been painted with a three-tone colour scheme comprising of white background, black lettering and green posts and capping.

According to the Statement of Heritage Significance, the Wollstonecraft Railway Station Sign is identified as a historical reminder of its workmanship during the 1930s-1940s era as it is a representative example of the precast concrete signage used by the railways. Sign on Platform 2 appears to be in better condition compared to the sign located on Platform 1 due to peeling paint of letters and chipped paint from the signposts.



Figure 6-17 Wollstonecraft station sign (left image is on Platform 1 and right image is on Platform 2)

Table 6-9 Listed heritage items

Item Name (ID)	Location	Significance	Distance from site
Wollstonecraft Railway Station Sign (SHI 4800121)	Wollstonecraft Station, Shirley Road, Wollstonecraft	S170	Within site boundary
North Sydney Bus Shelter (I0407)	Milner Crescent, Wollstonecraft	Local	60m east
The Briars (I1118)	3 Telopea Street, Wollstonecraft	Local	35m west
House (I1111)	46 Shirley Road, Wollstonecraft	Local	75m southwest
House (I1117)	2 Telopea Street, Wollstonecraft	Local	100m west
House (I1119)	4A Telopea Street, Wollstonecraft	Local	100m southwest

Item Name (ID)	Location	Significance	Distance from site
Tullamore (I11120)	11 Telopea Street, Wollstonecraft	Local	100 west
Wollstonecraft Conservation Area (CA25)	Wollstonecraft	Local	Directly west and south
Wollstonecraft (Russell Street) Underbridge (SHI 4801061)	Russell Street, Wollstonecraft	S170	Directly north of the Proposal

Archaeological potential

No identified non-aboriginal archaeological potential were identified as part of the SOHI.

6.5.2. Potential impacts

a) Construction phase

Assessment of construction impacts is outlined in Table 6-10. Full details of the assessment can be found in Technical Paper 4 – *Statement of Heritage Impact*.

Table 6-10 Summary of non-indigenous heritage during construction

Component	Assessment
Construction of a new lift connecting Shirley Road entry to Platform 1	<p>A minor impact on the setting of the station is expected due to the following:</p> <ul style="list-style-type: none"> • installation of lift shaft to cut through the rock cutting and existing landscaped area at the southern end of the station • lift shaft would project above the surrounding paths, landscape and overbridge • selection of materials and colour scheme would be sympathetic to the surrounding station environment.
Accessible return ramp from Shirley Road and the Shirley Road Overbridge to Platform 1	<p>A minor heritage impact to the landscape setting of the station is expected due to the following:</p> <ul style="list-style-type: none"> • various tree removal to accommodate access ramps, lift and footpath • existing vegetation accounts as an important contribution to the character of the adjacent conservation area and the setting of the station.
Construction of a new lift connecting Telopea Road and the Shirley Road Overbridge to Platform 2	<p>A minor heritage and minor impact on the setting of the station is expected due to the following:</p> <ul style="list-style-type: none"> • construction of lift shaft is located in an unobtrusive location toward the back against the wall of the sandstone cutting • lift shaft would project above the surrounding landscape and neighbouring building • selection of materials and colour scheme would be sympathetic to the surrounding station environment.
Accessible ramp from Shirley Road Overbridge to Platform 2 lift	<p>A minor impact to landscape setting of the station is expected due to the following:</p> <ul style="list-style-type: none"> • various tree removal and vegetation to accommodate access ramps and lift • existing vegetation accounts as an important contribution to the character of the adjacent conservation area and the setting of the station • modifications to billboard advertising near the sandstone rocks.

Component	Assessment
Maintained historic signs and lamp bases	A positive heritage impact would occur as during construction the local heritage listed, Wollstonecraft Station signs would be maintained.
Stabilising and grading of Platforms 1 and 2 including new Tactile Ground Surface Indicators	Negligible to minor heritage impacts are expected due to the following: <ul style="list-style-type: none"> • regrading of the platform works would be minor • potential impact to surviving early three brick dish (from 1927) drain at the rear of platform 2.
Modification of station building works	There are no heritage impacts expected for the proposed works of the modification of internal station building works. There is a minor heritage impact for the construction of the new Mains Switch Room on the southern end of the Platform 1 station building as it would alter the landscaping associated with the station.
Shirley Road and overbridge works	There are no heritage impacts expected for works along Shirley Road including footpath works, reconfiguration of traffic lanes and installation of handrails. There would be a moderate impact on the landscape setting of the bridge as tree removal would be required to accommodate the modifications to the eastern and western ramp access points on Shirley Road Overbridge approaches.
Intermodal upgrades	There are no heritage impacts expected for the proposed works related to intermodal upgrades.
Installation of AusGrid electrical transformer	There is a minor heritage impact on the landscape setting as the proposed transformer would require tree and vegetation removal.

During construction, there would be minor impacts from the Proposal on the following heritage items due to the following:

- Wollstonecraft Conservation Area – removal of vegetation and trees to accommodate the various proposed works
- platform brick drain – regrade of Platform 2.

b) Operation phase

During the operation of the Proposal, the maintained historic signs and street lamps would provide a positive heritage benefit. Other heritage impacts are expected to be minor to moderate as it impacts the heritage fabric and values of the station due to the following:

- the new lifts would project above the surrounding paths, landscape and overbridge
- the new access ramps resulting in an increase in hard surfaces and a net loss of trees
- new high fences and screens visually impacting on the landscape setting
- regrading and resurfacing of Platform 1
- regrading and resurfacing of Platform 2 impacting the platform brick drain
- provision and placement of boarding assistance zone on Platform 1 and 2
- placement of AusGrid electrical transformer with fencing and cleared vegetation and trees

- impact on the Wollstonecraft Conservation Area from the removed vegetation and trees and new structures impacting the station's fit into the landscape context and relationship with the conservation area
- overall operational impacts are expected to be minor.

The mitigation measures outlined below in Section 7.2 would ensure that any noted impacts would be minimised.

6.5.3. Mitigation measures

The full list of mitigation measures for potential non-indigenous heritage impacts are described in Table 7-1 in Section 7.2. The following are a summary of site-specific mitigation measures recommended for this Proposal:

- selection of compatible materials and colours:
 - the colour and texture of the concrete base of the lift be selected to complement the immediate natural (adjacent rockface) and built (station buildings and bridge piers) surroundings and use of lighter mid tone colour for screens
 - retaining walls and footpath recommended to match existing sandstone or brick walling
 - lightweight or transparent materials (e.g. lifts, screens)
- management of trees and vegetation:
 - new landscaping to offset the lost vegetation and trees including small trees and shrubs
 - remaining trees protected during construction
 - new landscaping compatible with existing station design
- include landscaping and vegetation to screen the new transformer
- during detailed design, maintain three brick dish drain at the rear of Platform 2 during the regrading and resurfacing of Platform 2
- ensure that shelters and any associated structures or elements do not obscure the historic station signs.

6.6. Biodiversity

This section provides a summary of the *Biodiversity Assessment Report* prepared by WSP and Earthscape Horticultural Services (2020) (Technical Paper 5). The assessment included the following tasks:

- review of legislative context including State and Commonwealth legislation
- desktop assessment to identify threatened species
- assessment using data sources including site survey, aerial photographs, priority weeds search from Department of Primary Industries, background documents from Preliminary Environmental Assessment and various database searches
- tree impact survey and assessment
- impact assessment of the Proposal on ecology and potential tree removal impacts and pruning with associated mitigation measures as required.

6.6.1. Existing environment

Vegetation communities

Two vegetation communities were recorded within or adjacent the Proposal during the field survey. These communities included one native Plant Community Type (PCT) and one non-native miscellaneous ecosystem and are described below.

PCT 1778 Smooth-barked apple – coast banksia / cheese tree open forest on sandstone slopes on the foreshores of the drowned river valleys of Sydney

This native vegetation community was recorded within and immediately to the north of the Shirley Road within the north of the Proposal. The vegetation typically occurred as either regrowth (Figure 6-18) and/or as a highly modified forest with a canopy of urban native/exotic planted canopy trees Figure 6-19. PCT 1778 within the Proposal generally occurred on soils derived from sandstone geologies with minor shale enrichment.

Details of vegetation communities are included in Technical Paper 5.

To the north of the Proposal, PCT 1778 is more dominated by native species characteristic of the community, including *Angophora costata* (Smooth-barked Apple), *Eucalyptus pilularis* (Blackbutt), *Pteridium esculentum* (Common Bracken), *Themeda triandra* (Kangaroo Grass) and *Lomandra longifolia* (Spiny-headed Mat-rush).

Based on floristic, geographical and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 1778 within the BioNet Vegetation Classification Database (Office of Environment, Energy and Science 2020). PCT 1778 does not form part of any threatened ecological communities listed under either the BC Act or the EPBC Act.



Figure 6-18 Regrowth PCT 1778 within the rail corridor



Figure 6-19 Heavily modified PCT 1778 within the Proposal

Highly disturbed areas with no or limited native vegetation

This non-native vegetation community occurs over most of the Proposal with all associated works being located within this vegetation type. This community includes the 'Urban exotic/native' miscellaneous ecosystem which was comprised of ornamental landscape plantings, exotic lawn and environmental weeds.

This miscellaneous ecosystem was comprised of planted ornamental trees and environmental weeds and exotic lawn. Details of are included in Technical Paper 5.



Figure 6-20 Miscellaneous ecosystem: Urban exotic/native garden beds



Figure 6-21 Miscellaneous ecosystems: Urban/exotic managed lawn and garden beds

Trees

The surrounding area of the Proposal contains open lawns and gardens with a variety of non-local native and exotic (introduced) mature and semi-mature exotic trees, typical of most railway station gardens along the North Shore Railway Line.

The original vegetation consisted of tall open forest (Blue Gum High Forest) which was progressively logged for timber-getting then cleared for agricultural use (mainly orchards and market gardens). There were no remnant locally-indigenous trees identified.

Existing trees and their conditions are detailed in Table 6-11. Figure 6-22 and Figure 6-23 shows their location near the Proposal.

Table 6-11 Existing tree species and description

ID	Species	Health (vigour)	Retention value
1	Golden Brunnings Cypress <i>Cupressus macrocarpa 'Brunniana Aurea'</i>	Good	Moderate
2	Maidenhair Tree <i>Ginkgo biloba</i>	Fair with thinning crown	Very low
3	Ivory Curl Flower <i>Buckinghamia celsisima</i>	Very good	Moderate
4	Water Gum <i>Tristaniaopsis laurina</i>	Good	Moderate
5	Jacaranda <i>Jacaranda mimosifolia</i>	Fair with slightly thinning crown	Moderate
6	Brushbox <i>Lophostemon confertus</i>	Good	Moderate
7	Liquidambar <i>Liquidambar styraciflua</i>	Good	High
8	Cocos Palms <i>Syagrus romanzoffianum</i>	Good	Low
9	Cocos Palms <i>Syagrus romanzoffianum</i>	Good	Low
10	Cocos Palms <i>Syagrus romanzoffianum</i>	Good	Low

ID	Species	Health (vigour)	Retention value
11	Cocos Palms <i>Syagrus romanzoffianum</i>	Good	Low
12	Mugga Ironbark <i>Eucalyptus sideroxylon</i>	Good	High
13	Cocos Palms <i>Syagrus romanzoffianum</i>	Good	Low
14	Cocos Palms <i>Syagrus romanzoffianum</i>	Good	Low
15	Cocos Palms <i>Syagrus romanzoffianum</i>	Good	Low
16	Sweet Pittosporum <i>Pittosporum undalatum</i>	Fair with slightly thinning crown	Very low
17	African Olive <i>Olea europaea subsp. afriana</i>	Fair with slightly thinning crown	Very low
18	Sweet Pittosporum <i>Pittosporum undalatum</i>	Fair with slightly thinning crown	Very low
19	Sweet Pittosporum <i>Pittosporum undalatum</i>	Fair with slightly thinning crown	Very low
20	Sweet Pittosporum <i>Pittosporum undalatum</i>	Fair	Very low
21	Cotoneaster <i>Cotoneaster sp.</i>	Fair	Very low
22	African Olive <i>Olea europaea subsp. afriana</i>	Good	Very low
23	Cabbage Tree Palm <i>Livistona australis</i>	Very good	High
24	Cabbage Tree Palm <i>Livistona australis</i>	Very good	Moderate
25	Cabbage Tree Palm <i>Livistona australis</i>	Very good	Low
26	Cabbage Tree Palm <i>Livistona australis</i>	Very good	Low
27	Lillypilly (row of 6) <i>Syzygium sp.</i>	Very good	Low
28	Chinese Hackberry <i>Celtis sinensis</i>	Very good	Very low
29	Silky Oak <i>Grevillea robusta</i>	Good	Very low
30	Sweet Pittosporum <i>Pittosporum undalatum</i>	Good	Very low
31	Sweet Pittosporum <i>Pittosporum undalatum</i>	Fair with slightly thinning crown	Very low
32	Black She-oak <i>Allocasuarina littoralis</i>	Good	Low
33	Black She-oak <i>Allocasuarina littoralis</i>	Good	Low

ID	Species	Health (vigour)	Retention value
34	Golden Hinoki Cypress <i>Chamaescyparis obtuse</i> 'Crippsii'	Very good	High
35	Crepe Myrtle <i>Lagerstroemia indica</i>	Very good	Moderate

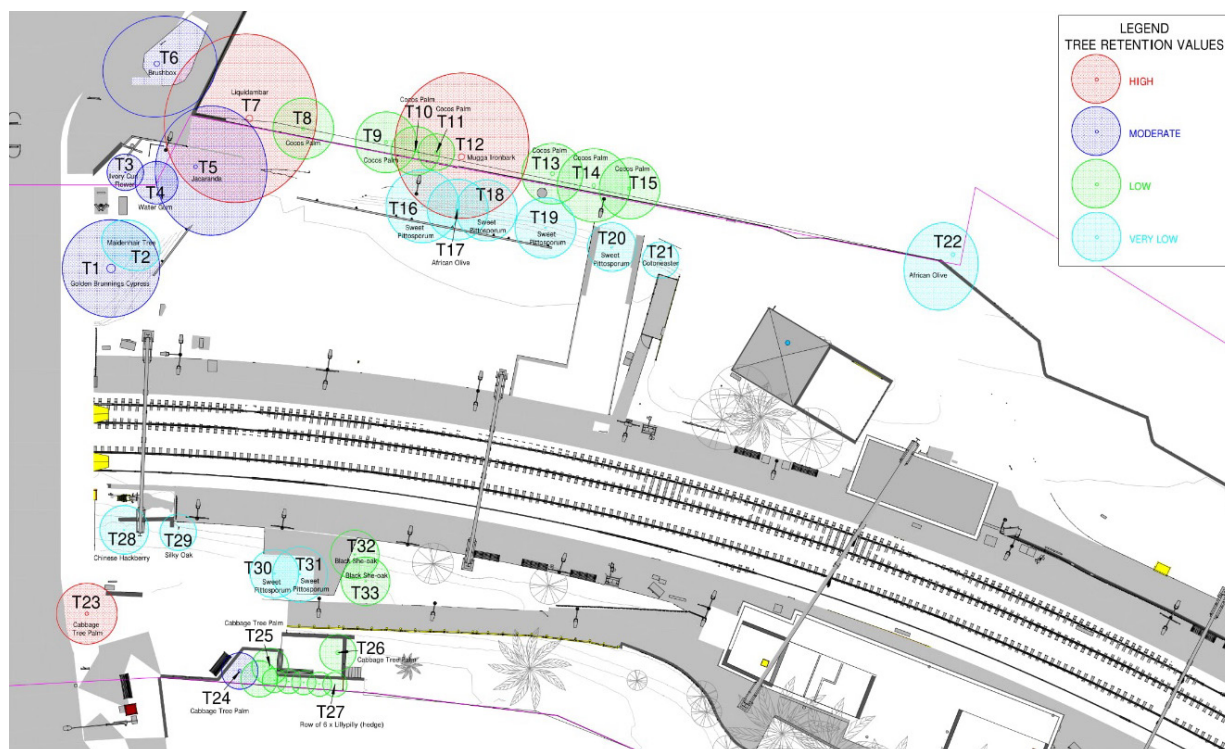


Figure 6-22 Existing trees at Wollstonecraft Station (1 of 2)

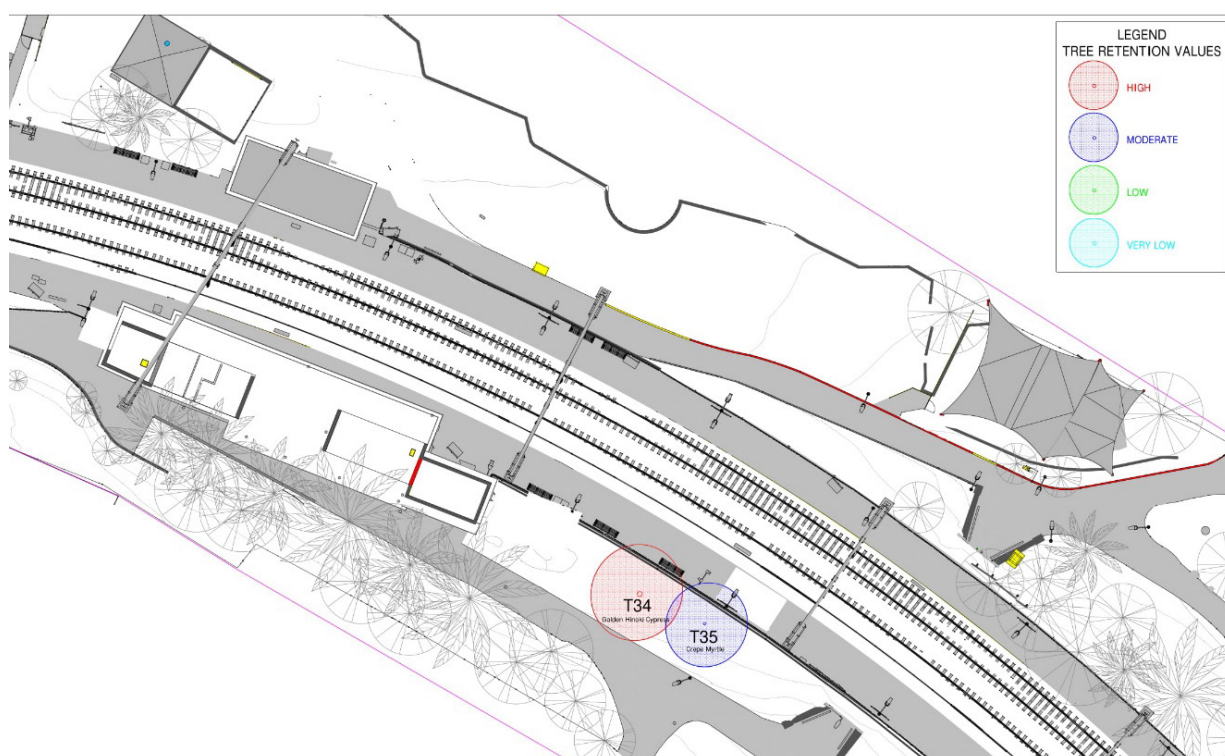


Figure 6-23 Existing trees at Wollstonecraft Station (2 of 2)

Fauna habitats

The fauna habitat within the Proposal is limited, with majority of vegetation consisting of planted ornamental native, exotic/native trees and shrubs and some remnant native vegetation.

Habitat connectivity is limited due to fragmentation and barriers associated with the existing railway corridor and surrounding urban development. Species likely to use the fragmented nature of remnant vegetation are those well adapted to the urban environments or those species that are highly mobile.

Much of the vegetation within the Proposal has been previously cleared for rail infrastructure and urban development and what remains consists of a highly modified habitat. Where native vegetation persisted, the canopy was largely comprised of planted native trees (i.e. Tallowwood (*Eucalyptus microcorys*), Brush Box (*Lophostemon confertus*) and Spotted Gum (*Corymbia maculata*)) with a mid-storey of regrowth native species (e.g. Cheese Tree (*Glochidion ferdinandi*), Turpentine (*Syncarpia glomulifera subsp. glomulifera*) & She-oaks (*Allocasuarina torulosa* and *Allocasuarina littoralis*)) and a predominately exotic understorey.

The habitat and vegetation within the Proposal provides limited resources and generally lacks important features such as hollow bearing trees, rocky outcrops or fallen woody debris.

The Proposal does not provide any significant habitat for fauna and species likely to utilise resources are those that are well adapted to urban environments or those species that are highly mobile (i.e. birds and bats). The surrounding trees (both native and introduced) provide some foraging habitat (i.e. fruits and blossom) for mobile species (i.e. birds and bats) including foraging habitat for the Powerful Owl and Grey-headed Flying-fox. It is unlikely that these resources are heavily utilised or relied upon by the majority of fauna but instead are intermittently used whilst foraging within the greater locality.

Weeds

Three Priority Weeds listed under the *Biosecurity Act 2015* for the Greater Sydney Region were identified in the Proposal including the following:

- African Olive (*Olea europea* var. *cuspidata*)
- Asparagus Fern (*Asparagus aethiopicus*)
- Madeira Vine (*Anredera cordifolia*)

The Asparagus Fern and Madeira Vine are listed as Weeds of National Significance (WONs).

Trees identified as Environmental Weed Species within the LGA of the Sydney Metropolitan Area include the following:

- Cotoneaster (*Cotoneaster* sp.) – T21
- Cocos Palm (*Syagrus romanzoffianum*) – T8, T9, T10, T11, T13, T14 and T15.

Threatened biodiversity

Threatened Ecological Community

There are no threatened ecological communities identified within the Proposal.

Threatened Flora

No threatened flora species were identified during site inspections. Background investigations identified 46 threatened flora species listed under the BC Act and/or EPBC Act that were considered to have the potential to occur within the locality of the Proposal.

The Proposal is considered unlikely to provide habitat for any threatened flora species based on the availability of habitats present and results of the site inspection.

No assessments of significance for any threatened flora species listed under either the BC Act or EPBC Act are considered warranted to assess the impacts of the Proposal.

Threatened Fauna

No threatened fauna species were identified during site inspections. Background investigations identified 77 threatened fauna species listed under the BC Act and/or EPBC Act that have been previously recorded or have the potential to occur within the Proposal.

The likelihood of these species occurring within the Proposal was determined as moderate to high including the Grey-headed Flying-fox (*Pteropus poliocephalus*) and Powerful owl (*Ninox strenua*). Both species are identified as Vulnerable under the BC Act and the Grey-headed Flying-fox is also identified as Vulnerable under the EPBC Act.

The habitat within the Proposal is foraging habitat only and represents a small proportion of available habitat within locality. Other habitats within the locality are of higher quality. It is considered unlikely that this species relies on habitat within the Proposal.

Migratory species

Migratory species are protected under international agreements, to which Australia is a signatory, including Japan Australian Migratory Bird Agreement (JAMBA), China Australia Migratory Bird Agreement (CAMBA), Republic of Korea Australia Migratory Bird Agreement (RoKAMBA) and the Bonn Convention on the Conservation of Migratory Species of Wild Animals. Migratory species are considered MNES and are protected under the EPBC Act.

A total of 37 species listed as migratory under the EPBC Act were identified during background investigations (excluding marine species) that have been previously recorded or have the potential to occur within the Proposal. Of these, no species are considered likely to utilise the habitat.

The habitats within the Proposal are unlikely to constitute important habitat for any of the listed species. The habitat present is unlikely to support significant proportions of the population of any migratory species, nor are the habitats critical to any life stage of these species. Due to their mobile nature, the identified species are likely to utilise higher quality habitat within the greater locality and where more extensive tracts of native vegetation occur. For these reasons migratory species are unlikely to be impacted by the Proposal and are not further considered within this assessment.

6.6.2. Potential impacts

a) Construction phase

Direct and indirect impacts

Removal of vegetation

Direct impacts to biodiversity are considered negligible due to the existing disturbed nature of the available habitat and the minimal vegetation clearing of approximately 0.14 hectares of urban native/exotic ornamental plantings, environmental weeds and exotic lawn.

No impacts to patches of remnant native vegetation or high-quality fauna habitat are predicted because of the Proposal. Direct mortality or trauma to fauna is also expected to be minimal as habitat to be removed is of low quality (i.e. planted native trees and landscape gardens).

Removal of trees

There are 13 trees identified for tree removal (T1, T2, T5, T20, T23, T26, T27, T28, T29, T30, T31, T32 and T35) to allow for the construction of the Proposal. None of these trees are considered significant or worth of special measures to ensure their preservation. Removal of these trees is to accommodate the Proposal and considered warranted.

Identified trees within the Proposal are identified as comparatively low in ecological value and do not form part of any threatened ecological community or important habitat for threatened species.

The trees identified within the Proposal do not contain important habitat features (i.e. hollows for breeding) for any potential threatened species known or predicted to occur. There is an unlikely impact to threatened species or ecological communities, or their habitats.

Impacts to threatened fauna

Two threatened fauna (Grey-headed Flying-fox (*Pteropus poliocephalus*) and Powerful Owl (*Ninox strenua*)) are considered to have a moderate to high likelihood to occur within the Proposal and, as a result, be potentially impacted by the construction of the Proposal.

Assessments of Significance for both species concluded that these species are not considered likely to have impacts by the Proposal.

The mitigation measures outlined below in Section 7.2 would ensure that any possible indirect impacts would be minimised.

Potential environmental impact of noise, light and vibrations on wildlife

It is likely that noise from the existing rail corridor and arterial roads would already impact background levels of noise at the existing station. However, during construction may cause additional disturbance to animals. The impacts from noise emissions are likely to be localised close to the Proposal and are not likely to have a significant long-term impact on wildlife populations, given that populations are already exposed to noise associated with the existing rail corridor. Furthermore, it is likely that most animal species would habituate to periodic noise disturbance from regular maintenance activities (Forman et al. 2000).

Under present conditions there is moderate to low ecological light pollution within the Proposal associated with the existing train station and carpark. The increase of lighting during the construction is however likely to be inconsequential and significant ecological light pollution impact to wildlife is unlikely.

Weeds

The Proposal is unlikely to impact any Priority Weeds listed under the *Biosecurity Act 2015* for the Greater Sydney Region such that they would pose a risk to any areas of native vegetation.

b) Operation phase

The operation of the Proposal is not anticipated to result in any further impacts to biodiversity.

6.6.3. Mitigation measures

Construction and operation of the Proposal would be undertaken in accordance with Transport for NSW's *Vegetation Management (Protection and Removal) Guideline*, Transport for NSW's *Fauna Management Guideline* and Transport for NSW's *Biodiversity Offsets Calculator*.

There are 10 trees identified requiring offsets. It is expected that 42 trees would be required to meet this offset requirement. Details of tree species and number offsets are in Table 8.2 of Technical Paper 5.

Refer to Table 7-1 in Section 7.2 for a full list of proposed mitigation measures to be incorporated into the CEMP.

6.7. Socio-economic impacts

6.7.1. Existing environment

As discussed in Chapter 4, the Proposal would primarily be located within the existing rail corridor. Land use surrounding the Proposal typically comprises of low to high density residential properties with recreational areas located in proximity to the Proposal. Residences are located directly adjacent and surround the Proposal.

Existing businesses are part of Wollstonecraft Station and on the southwest side adjacent to Platform 2 which include retail and cafes. Outside of Wollstonecraft Station, there is one existing business (a clothing store) located about 130 metres northeast from the Proposal.

Within the broader area of the Wollstonecraft Station, there are six recreational/community areas, three religious facilities and two educational centres within 500 metres.

Sensitive receivers that have the potential to be influenced by the Proposal include:

- directly adjacent local residents, particularly those located directly adjacent to the station as well as Shirley Road, Telopea Street, Belmont Avenue and Milner Cres
- critical care facilities like the Tresillian Family Care Centre about 100 metres away
- Sydney Trains customers using Wollstonecraft station.

A review of the 2016 Australian Bureau of Statistics (ABS) Census data was undertaken for Wollstonecraft. The suburb of Wollstonecraft has a population of about 8,000 people with a median age of 36 years. Of this population, 90 per cent were employed and around 43.4 per cent identified travelling to work via public transport. Train travel was the preferred common mode of travel to work (ABS, 2016).

6.7.2. Potential impacts

a) Construction phase

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

- temporary changes to vehicular, bicycle and pedestrian access routes to, through and around the station
- temporary closures of Wollstonecraft Station to accommodate construction work (as part of pre-scheduled rail shutdown periods)
- commuter parking impacts due to temporary closure of commuter car park
- temporary disruptions to station facilities and amenities (e.g. seating, toilets)
- temporary disruptions to existing retail shops
- temporary impacts to local traffic movements due to an increase in truck movements in the area, delivering site materials, plant and equipment
- construction noise, dust and visual impacts.

Access for emergency services would be maintained at all times and it is not anticipated that access to residential properties would be affected during construction of the Proposal.

Construction work would be managed to ensure pedestrian and cyclist access to and through the station would be maintained. Where work is carried out that may potentially disrupt the existing pedestrian facilities, appropriate signage and/or traffic controllers would be positioned to notify pedestrians of the temporary arrangements.

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

b) Operation phase

Overall, the Proposal would provide positive socio-economic benefits to the Wollstonecraft community and the North Sydney Council LGA, including:

- improved access to public transport by providing an accessible path to Wollstonecraft Station platforms and station retail shops through the provision of upgraded footpaths and lifts, regraded platform surface and an upgraded accessible parking spaces
- improved customer amenity and facilities at the station including a new family accessible toilet and two unisex ambulant toilets, new TGSIs and wayfinding signage
- improved access to connecting transport including new kiss and ride bay, new DSAPT compliant parking and improved access path to meet DDA requirements
- potential increased use of public transport to and from Wollstonecraft
- additional lighting and CCTV would provide positive CPTED outcomes for the area.

6.7.3. Mitigation measures

Impacts on the community would be managed through ensuring that access to, from and around the station would be maintained at all times, although there may be changes to access routes. The community would be provided with information of any changes in advance and would also be provided with contact details to make any complaints regarding the construction of the Proposal.

Refer to Table 7-1 in Section 7.2 for a full list of proposed mitigation measures.

6.8. Contamination, geology and soils

6.8.1. Existing environment

Landform, geology and soils

The northern and southern extents of Wollstonecraft Station are characterised by two different types of topography, geology and soil landscapes. The *Soil Landscapes of Central and Eastern NSW – v2* provides the following information on natural topography, geology and associated soil landscapes (DPIE, 2020).

Although soils in the Proposal have been extensively disturbed and modified for urban development, the original soils in this area are typical of the Blacktown Soil Landscape Group which is characteristic of the Wianamatta Group shale and Hawkesbury shale (as classified in the Soil Landscapes of the Sydney 1:100,000 Sheet). This consists of shallow to moderately deep (less than 1,000 millimetres) Red & Brown Podzolic Soils on crests, upper slopes and well drained areas. Soils on lower slopes and areas of poor drainage consist of deep (1,500-3,000 millimetres) Yellow Podzolic Soils and Soloth Soils.

The landscape generally consists of undulating rises with slopes ranging usually less than five per cent grade. Along the railway line, the land is relatively flat, sloping slightly downwards south with soil depth generally less than 100 centimetres, and composed of red and brown podzolic soils. This area is underlain with Triassic Hawkesbury Sandstone, which comprises medium to coarse-grained quartz sandstone and very minor shale and laminate lenses. Existing geological assessment of the site describes the rock conditions as weathered shale and siltstone (SMEC 2018). Limitations of this landscape include a moderately reactive and highly plastic subsoil, low soil fertility, and poor soil drainage.

The natural topography of the northern extent of Wollstonecraft Station is relatively flat with shallow soil and composed of discontinuous lithosoils and siliceous sands, some earthy sands, yellow earths and yellow podzolic soils along with underlying geology containing Hawkesbury Sandstone.

Upon assessment, the rock conditions were seen to transition from weathered shale and siltstone to sandstone on the northern end of the Proposal (SMEC 2018). Limitations of this landscape include extreme erosion, shallow and highly permeable soil and low fertility.

Acid sulphate soils

There are no known occurrence or low probability of risk of occurrence of Acid Sulphate Soils in the Proposal area.

Contamination

There is a potential for contamination within the rail corridor due to its historic and current operation of rail infrastructure. Standard chemicals commonly associated with railway yards include hydrocarbons, arsenic, phenolics, heavy metal, nitrates, ammonia, organochlorine and organophosphate pesticides.

A search of the public register of notices issued by the NSW EPA under the *Contaminated Land Management Act 1997* was conducted on 10 January 2020. The land register did not identify any registered or listed contaminated sites in or within proximity to the Proposal. The Contamination Investigation Report (Jacobs, 2020) also indicates there were no identified contamination sites within the Proposal. Therefore, this indicates that there are no regulated sites in the vicinity of Wollstonecraft Station.

6.8.2. Potential impacts

a) Construction phase

The Proposal would require excavation work for the installation of foundations and footings for new lift shaft, electrical cabling, relocation of underground services as well as stabilisation works of Platform 1 and 2. Other trenching or excavation would be required for the proposed footpath re-grading and relocation of above ground services (e.g. mailbox drop off area).

Soil disturbance

Excavation and other earthworks such as rock cutting, regrading, vegetation removal, trenching and stockpiling activities, if not adequately managed, could result in the following impacts:

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

Such impacts can be a disruptive to community members and/or lead to an adverse environmental impact on water quality and biodiversity, for example through the introduction of sediment into waterways. However, soil disturbance is considered low and impacts are expected to be minor.

Erosion risks can be adequately managed through the implementation of mitigation measures outlined below and in Section 7.2.

Contamination

The Proposal has the potential to expose undiscovered contaminants, which if not appropriately managed, can present a health risk to construction workers and the community. The exposure of contaminants is likely to be minor as no identified contaminants have been identified. If contaminants are discovered however, this could also pose an environmental risk should they enter nearby waterways through the stormwater infrastructure.

Although no contaminations are identified, the Proposal has the potential risk to disturb asbestos containing materials and other hazardous substances (such as lead paint and PCBs) from the works within the station building. There is also potential for construction activities to result in the contamination of soil through accidental fuel or chemical spills from construction plant and equipment.

Appropriate mitigation measures would be implemented to manage any hazardous substances encountered during demolition work. This would include the removal of hazardous materials by appropriately licensed asbestos/hazardous waste removalists (refer to Section 6.8.3 below). In addition, if there unexpected contaminants are found, an appropriate unexpected finds protocol would be in place.

b) Operation phase

There would be no ongoing operational risks to geology and soils as a result of the Proposal.

6.8.3. Mitigation measures

Refer to Table 7-1 in Section 7.2 for a full list of proposed mitigation measures with respect to potential soil and contamination impacts.

6.9. Hydrology and water quality

6.9.1. Existing environment

Surface water

A review of the ePlanning portal indicated that the Proposal is not located within a flood planning area due to the elevation and topography of the local area. The nearest local creek to the station is Berrys Creek (about 140 metres to the northeast of the Proposal).

Platform 1 does not have any existing formalised drainage infrastructure, and currently collects standing water on the platform. Water runoff and drainage is located on Platform 1 north side and Platform 2 off from the rail corridor to the open space within the station, which then discharges through to local council-maintained infrastructure.

Groundwater

Depth to groundwater of the Proposal was not determined as bore hole investigations did not determine or identify any nearby groundwater (Jacobs 2020).

Existing water quality

No water quality information was available based on WaterNSW data portal for this Proposal. Wollstonecraft Station is not located within one of the regional water catchment areas.

The closest water body to the station is Gore Cove located 330 metres southwest which is primarily for commercial use. Recreational use of Gore Cove is located further south toward Berry Island Reserve.

6.9.2. Potential impacts

a) Construction phase

Excavation activities during construction from the stabilisation of the platforms have the potential to impact on local waterways due to increased erosion and sedimentation from exposed soil and stockpiles. The amount for these works is about 1 metre of fill removed so impacts are expected to be minor.

Additionally, fuels, chemicals or wastewater from accidental spills during construction could potentially enter stormwater drains and flow into nearby waters. However, standard mitigation measures would be implemented during construction to minimise this risk.

There is not expected to be any groundwater impacts during construction as no deep excavations (no more than 6 metres) that may encounter the groundwater table are proposed.

The Proposal is not expected to be subject to wide spread flooding, however following larger rainfall events some localised flood may occur. This flooding has the potential to increase the risk of erosion and sedimentation particularly in areas where vegetation clearing or excavation have been undertaken. These impacts would be minimised through implementing the mitigation measures outlined in Section 7.2.

WaterNSW requires that any impacts from the Proposal must result in neutral or beneficial effect (NoRBE) on water quality for proposal's located within a drinking water catchment. This includes an assessment of the adequacy of the mitigation methods and safeguards to be implemented. The Proposal is not located within a drinking water catchment. As such, a NoRBE assessment was not required to be undertaken for the Proposal.

Overall, the minor nature and extent of construction of the Proposal, hydrology and water quality impacts are likely to be minor.

b) Operation phase

The Proposal is unlikely to have a substantial impact on the hydrology of the surrounding area.

Regrading of the Platform 2 surface and upgrading of the station footpaths and ramps may result in a minor alteration to the surface water flow regime; however, the overall impact on hydrology from these alterations is expected to be negligible.

Alterations to the surface water flows would also likely be within the capacity of the stormwater network and as such, impacts are expected to be minor. Additionally, the Proposal would include a minor increase of impervious surfaces adjacent to the retail shops along Platform 2 for regrading of the pedestrian footpath with likely minor impacts.

Overall, impacts to surface water flows during operation are considered to be minor.

6.9.3. Mitigation measures

Refer to Table 7-1 in Section 7.2 for a full list of proposed mitigation measures with respect to water quality and hydrology.

6.10. Air quality

6.10.1. Existing environment

Regional air quality

The Sydney East monitoring region provides the most representative air quality monitoring results for the Proposal. The Sydney East monitoring region includes air monitoring sites at Cook and Phillip, Randwick, Rozelle, Chullora, Earlwood and Macquarie Park.

Air quality results obtained from the closest monitoring station is Macquarie Park (about 10 kilometres from the Proposal) indicate that the 2019 annual average concentrations of particulate matter (PM_{2.5}) at Macquarie Park monitoring station is around 9.2 µg/m³ (micrograms per cubic meter).

At the time of writing, the latest air quality index (AQI) reading taken at Macquarie Park measured 20, which is a 'very good' reading, and the 24 hour average PM_{2.5} concentration was 3.8 µg/m³ which is classified as 'very good'. Hence, it is unlikely that the air quality would fall below a 'good' or 'very good' classification.

Air pollutant sources

Based on the land uses surrounding Wollstonecraft Station, the existing air quality is likely to be characteristic of a suburban environment. A search of the National Pollutant Inventory undertaken on 10 January 2020 identified no registered facilities within the North Sydney Council LGA. The search identified 72 air polluting substances from one source in the North Sydney Council LGA.

Other contributors to air quality within the local area would include emissions from motor vehicles on the surrounding road network.

Sensitive receivers

Sensitive receivers in the vicinity of the Proposal include:

- local residents, particularly on Telopea Street, Shirley Road, Milner Crescent and Belmont Avenue
- Sydney Trains customers using Wollstonecraft Station.

6.10.2. Potential impacts

a) Construction phase

The main air quality impacts that have the potential to occur during construction would be temporary impacts associated with dust particles and emissions of carbon monoxide, sulphur dioxide, particulate matter (PM₁₀), particulate matter (PM_{2.5}), nitrous oxides, volatile organic compounds and polycyclic aromatic hydrocarbons associated with the combustion of diesel fuel and petrol from construction plant and equipment.

Anticipated sources of dust and dust-generating activities include:

- excavation for the foundation and pit of the lift
- excavation, stabilisation and regrading of Platform 1 and 2
- demolition works within the platform building such as toilet modifications
- stockpiling activities
- loading and transfer of material from trucks
- other general construction activities.

The Proposal would be likely to have a minimal to minor impact on air quality as most works are do not include extensive excavation except for works related to stabilisation of Platform 1 and 2 which has the potential to generate significant quantities of dust. Standard mitigation measures would be applied and further described in Section 6.10.3.

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

b) Operation phase

The Proposal would increase access to public transport, the use of public transport is anticipated to increase.

Overall impacts of air quality during the operation of the Proposal are considered negligible to minor as the Proposal would not result in a significant change in land use.

6.10.3. Mitigation measures

Refer to Table 7-1 in Section 7.2 for a full list of proposed mitigation measures with respect to potential air quality impacts.

6.11. Waste and resources

6.11.1. Potential impacts

a) Construction phase

The construction of the Proposal would generate a range of waste streams including the following:

- asphalt and concrete
- earthworks spoil
- building material wastes (including metals, timbers, plastics, concrete and
- electrical wiring and conduit waste (from electrical connections)
- fuels, liquids and chemicals
- green waste (including weeds)
- demolition waste from the existing footpaths, from electrical wiring, and from the internal walls of the toilets, including potential asbestos and hazardous materials
- general waste, including food and other wastes generated by construction workers.

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

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

b) Operation phase

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

6.11.2. Mitigation measures

Refer to Table 7-1 in Section 7.2 for a full list of proposed mitigation measures with respect to potential waste impacts.

6.12. Hazard and risk

6.12.1. Existing environment

The existing environment of the Proposal consists of predominantly rail infrastructure. Land use surrounding Wollstonecraft station is mainly residential properties with medium to high density residential properties to the immediate west and high density residential properties to the east of Wollstonecraft station. Bushfire prone land classified as vegetation Category 2 (lower combustibility than Category 1 and 3 and/or limited potential fire size) are present within 100 metres of the Proposal, indicating a potential risk of bushfire.

The potential risks in the existing environment include the following:

- road traffic / risk of road traffic incidents which have the potential to cause injury
- working within the railway vicinity with potential risk of injury
- bushfire
- live services (e.g. electricity) which have the potential to cause injury.

6.12.2. Potential impacts

a) Construction phase

Risks associated with the construction of the Proposal would include:

- occupational work health and safety issues (e.g. injury of workers) associated with the workforce undertaking the construction and the construction methods used including:
 - collapse of rock cutting resulting from insufficient geotechnical information
 - conflict with overhead services resulting from crane operating closer to overhead service
 - conflict with unknown buried services
 - potential objects falling from the bridge onto tracks
 - collision between plant, vehicles and pedestrians.
- environmental impacts from the transport, storage and use of fuels, chemicals and other dangerous goods required for the construction work
- environmental impacts from the generation, storage, treatment and/or disposal of proposal-related wastes, including hazardous wastes (e.g. asbestos and PCBs) and sanitary waste from temporary construction facilities
- bushfire risk resulting from:
 - construction activities that are not conducted in accordance with standard work procedures including inappropriate storage of flammable chemicals from potential ignition source
 - electrical fault from equipment used during construction if powered device are not maintained.
- limiting local access due to partial closure of Shirley Road Overbridge which lead to:
 - potential delayed responses to incidents due to limited access for emergency services
 - disturbance to residents.
- injury due to trespassing and climbing from the new ramp onto existing platform.

b) Operation phase

Risks and hazards associated with the operation of the Proposal are minimal and not expected to be significant.

6.12.3. Mitigation measures

Refer to Table 7-1 in Section 7.2 for a full list of proposed mitigation measures with respect to potential hazards and risk.

6.13. Sustainability

The design of the Proposal would be based on the principles of sustainability, including targeting for an 'Excellent' rating under the Infrastructure Sustainability Council of Australia's (ISCA) Infrastructure Sustainability (IS) Rating Tool Version 1.2.

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

Through the Transport for NSW *Social Procurement Workforce (SPW) Policy*, Transport for NSW would also encourage industry to develop a socially sustainable inclusive workforce that addresses issues such as employment inclusiveness, diversity, capability development and safety when delivering Transport for NSW projects including this Proposal.

The SPW Policy outlines processes and activities required to conduct a workforce social impact assessment that would develop a plan containing:

- an assessment of the potential workforce within the region
- an analysis of the project workforce needs
- a workforce social impact management plan
- a range of employment outcomes for identified communities
- processes to manage, monitor, and review the progress of key performance indicators.

6.14. Climate change

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to the changes in climate and understand the limitation of adaptation. The climate risk assessment identified nine high risk impacts related to increased number of extreme heat days/heatwaves and number of storm incidents that may be caused by projected climate change (SMEC, 2018). No very high risk impacts were identified. Climate risks were posed by variable across extreme heat and heatwaves, bushfires, precipitation and flooding, and storms and strong winds.

Consideration of the potential climate change impacts on the Proposal identified the following impacts that would require further design considerations:

- increased frequency of hot days and daily mean temperature which can lead to heat stress and solar exposure for rail customers
- increased severe fire weather which needs to be considered in design to mitigate hazards during an emergency
- increased bushfire risk which could impact Information and Communication Technologies networks affecting communication and emergency response management
- power outages as a result of weather may increase the risk of lighting loss and other technological issues.

Following are adaption actions that would be considered in the next design stage:

- increase of bushfire risk due to a predicted increase in severe bushfire weather days and a predicted increase in temperature. This could be achieved through the choice of building materials
- increased drainage capacity to accommodate for an increase of
- storms and flood events due to a predicted increase in precipitation and severe weather events
- use of photo luminescent strips and products on ramps/stairs to direct passengers towards exits in the event of an emergency or power outage
- ensure there are sufficient measures for Information and Communication Technologies and lift equipment from extreme weather events.

Climate change adaptation measures would be further considered during detailed design and constructed where appropriate. Climate Change Adaptation benchmark requirements will be targeted as part of the IS Rating Submission.

6.15. Greenhouse gas emissions

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

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

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

It is anticipated that, once operational, the Proposal may result in an increase in use of public transport. 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.

6.16. Cumulative impacts

6.16.1. Existing or potential projects

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 NSW Government Major Projects Register, Sydney and Regional Planning Panels DA register, and North Sydney Council Development Application Register in January 2020 identified that a number of proposals and projects within the North Sydney LGA. and Lane Cove LGA.

The following current and proposed projects have been identified as the most likely to contribute to cumulative impacts from the Proposal, due to their scale and/or proximity to the Proposal as noted below.

Redevelopment of Greenwich Hospital (Concept)

A concept proposal for the redevelopment of Greenwich Hospital by HammondCare, including new health care and allied health facilities, residential aged care and seniors housing. This project is located approximately 850 metres west of the Proposal. The project published the Response to Submissions Report in September of 2019 and is awaiting assessment. Construction timing of this project is likely to coincide with the Proposal. There may be some potential traffic and noise and vibration impacts due to its proximity.

International Chinese School

This project involves the relocation of the International Chinese School from Chatswood to 211 Pacific Highway, St Leonards approximately 850 meters from the Proposal. The EIS for this project was submitted in late August 2019 and is currently collating and responding to community submissions. Construction on-site has been approved in 2018 under Willoughby Council development application CC-2018/182/A. Construction associated with this relocation may occur simultaneously with the Proposal.

Mater Hospital Addition

Alterations and additions to hospital including 3 levels of clinical accommodation and 2 levels of parking at 35 Rocklands Road, Wollstonecraft approximately 1 kilometre east of the Proposal. The application for this project was approved by the Sydney North Planning Panel late October 2018. Timing of construction with this Proposal may occur at the same time but not known at time of this writing.

Health Facility

Construction of a 5-storey health facility building for residential and day-stay programs at 25 Shirley Road, Wollstonecraft approximately 200 metres south of the Proposal. This project was approved by the Sydney North Planning Panel in mid-November 2018. The proponent of this project Tresillian Family Centres has not yet opened their facility in Wollstonecraft, so construction may be occurring simultaneously with the Proposal.

Four storey addition to Mater Hospital

This proposal involved a four storey addition to the Mater Hospital located at 35 Rocklands Road Wollstonecraft, approximately one kilometre east of the Proposal. This project was approved in mid-March 2013. No construction activities are currently occurring for this project, therefore no cumulative impacts would occur.

Several development applications have been lodged within 1 kilometre of the Proposal. No other major development proposals have been identified in the immediate vicinity of the Proposal.

6.16.2. Potential impacts

Construction phase

Cumulative impacts for this Proposal based on the identified existing projects are unlikely to be minor as the distance and magnitude of work are minimal. A project that may have potential minor cumulative impacts due to overlapping construction traffic, noise and vibration and some air quality impacts is the health facility as there may be some traffic and access impacts. However, it is expected that cumulative impacts would be minor.

Operation phase

Operational cumulative impacts are not expected and the Proposal would provide an environmental benefit. Traffic and transport impacts are likely to be positive, as traffic congestion may be slightly improved due to increased public transport use.

6.16.3. Mitigation measures

Consultation and liaison would occur with North Sydney Council, Lane Cove Council RailCorp/Sydney Trains, Tresillian Family Centres and any other developers identified as appropriate, to minimise cumulative construction impacts such as traffic and noise.

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.

Based on this assessment, it is anticipated that the cumulative impacts would be negligible, with the implementation of consultation with relevant stakeholders and associated mitigation measures in Chapter 7.

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.

7.1. Environmental management plans

A CEMP for the construction phase of the Proposal would be prepared in accordance with the requirements of the Transport for NSW 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 also include at 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 in Table 7-1. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6, should the Proposal proceed.

Table 7-1 Proposed mitigation measures

No.	Mitigation measure
General	
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of <i>Guideline for Preparation of Environmental Management Plans</i> , Department of Infrastructure, Planning and Natural Resources, 2004) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the Contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An Environmental Controls Map (ECM) would be developed by the Contractor in accordance with Transport for NSW's <i>Guide to Environmental Controls Map</i> (TfNSW, 2019e) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.
6.	Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on the ECM to avoid direct impacts during construction.
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by Transport for NSW. This assessment would need to demonstrate the Proposal, as modified, is not likely to significantly affect the environment.

No.	Mitigation measure
Traffic and transport	
8.	<p>Prior to the commencement of construction, a Construction Traffic Management Plan (CTMP) would be prepared as part of the Construction Environmental Management Plan and would include at a minimum:</p> <ul style="list-style-type: none"> ensuring adequate regulatory road signage, line marking and all other traffic control devices necessary 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 maintaining a reasonable level of public access across the rail corridor and to public transport services ensuring access to the railway station is always maintained outside of the scheduled track possession periods ensuring access to stations, businesses, and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made) managing impacts and changes to on and off-street parking and requirements for any temporary replacement provision parking locations for construction workers to be limited within the site compound and details of how this will be monitored for compliance routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses consultation with the relevant roads authorities would be undertaken during preparation of the CTMP and obtaining necessary Road Occupancy Licences for temporary road closures. The performance of all project traffic arrangements must be monitored during construction. the Contractor is to acquire a road occupancy license and crane permits for operating on road whilst not a specific part of the CTMP, conducting a drive-through assessment or swept path analysis is highly recommended to ensure that sufficient manoeuvring space is provided for the largest design vehicle along the proposed haulage routes heavy vehicle access plans would be prepared as a part of the construction traffic control management that would be implemented during the construction period for access between the northern compound site and Russell Street a Traffic Control Plan (TCP) to be developed for any construction works that requires lane closure on Shirley Road. TCP implementation will ensure adequate warning and guidance is provided to road users, thus minimising road related traffic impacts. TCP would be required to be submitted to Transport Management Centre (TMC), Transport for NSW, where required. This could also include management of general and construction vehicles entering and exiting the commuter car park and site compounds.
9.	<p>Communication would be provided to the community and residents to inform them of changes to parking, pedestrian or cyclist access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site works.</p>
10.	<p>Suitable vehicle, pedestrian and cyclist paths would be maintained throughout the construction of the proposed upgrade to ensure safe and easy access throughout the interchange outside of the scheduled track possession periods.</p>
11.	<p>Suitable pedestrian provisions would be made to ensure that pedestrian connectivity between bus stops is not impacted as a part of the works and that suitable and safe paths are provided.</p>
12.	<p>Qualified traffic controllers would be used during construction works 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.</p>
13.	<p>Fencing and barriers would be installed between construction site and outside construction zone to ensure safe and easy navigation of pedestrians and cyclists.</p>

No.	Mitigation measure
14.	<p>Construction staging of the Proposal to consider the following:</p> <ul style="list-style-type: none"> in parallel with lift installation, existing ramp access to Wollstonecraft Station platform level should be maintained. If any closure of the existing ramp access would be required for the lift installation, the construction works should be programmed to undertake during a scheduled track possession period to minimise the impacts to pedestrians staging new DDA compliant ramps, lifts and stairs (including demolishing existing non-complaint path) is necessary to minimise the impacts to pedestrians and cyclists accessing the station from the proposed works suitable access must be maintained between Wollstonecraft Station and the Shirley Road and Milray Avenue entrances during works to provide pedestrians with safe passage through or bypass of the construction areas and construction vehicle movements adequate width of vehicular and pedestrian paths should be provided with a temporary delineation during the westbound lane closure period over the Shirley Road Overbridge ensure priority building of relocated cycle racks to limit impacts to cyclists by minimising time without parking facilities
15.	Provision of shuttle bus services during rail possession periods to accommodate workforce.
Landscape and visual amenity	
16.	<p>An Urban and Landscape Design Plan (ULDP) would be prepared by the Contractor, in consultation with North Sydney Council, and submitted to Transport for NSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The ULDP, at a minimum, would address the following:</p> <ul style="list-style-type: none"> the appropriateness of the proposed design with respect to the existing surrounding landscape, built form, behaviours and use-patterns (including consideration of Crime Prevention Through Environmental Design principles). This is to include but not be limited to: <ul style="list-style-type: none"> site analysis vision and objectives for the infrastructure strategies that apply to ISCA approved guidelines in accordance with Urb-1 (ISCA version 1.2) connectivity with surrounding local and regional movement networks including street networks, other transport modes and active transport networks. Existing and proposed paths of travel for pedestrians and bicycles should be shown integration with surrounding local and regional open space and or landscape networks. Existing and proposed open space infrastructure/landscape elements should be shown integration with surrounding streetscape including street trees, entries, vehicle cross overs etc integration with surrounding built form (existing or desired future) including building height, scale, bulk, massing and land-use design detail that is sensitive to the amenity and character of heritage items located within or adjacent to the Proposal.
17.	<p>A Public Domain Plan (PDP) would be prepared by the Contractor, in consultation with North Sydney Council, and submitted to Transport for NSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The PDP, as a minimum, would address the following:</p> <ul style="list-style-type: none"> materials, finishes, colour schemes and maintenance procedures including graffiti control for new walls, barriers and fences location and design of pedestrian and bicycle pathways, street furniture including relocated bus and taxi facilities, bicycle storage (where relevant), telephones and lighting equipment.
18.	Landscape treatments and street tree planting to integrate with surrounding streetscape.

No.	Mitigation measure
19.	Opportunities for public art created by local artists to be incorporated, where considered appropriate, into the Proposal.
20.	Total water management principles to be integrated into the design where considered appropriate design measures included to meet Infrastructure Sustainability Rating Scheme - Version 1.2 (ISCA, 2018).
21.	Identification of design and landscaping aspects that would be open for stakeholder input, as required.
22.	All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to <i>AS 1158 Road Lighting</i> and <i>AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting</i> as part of the detailed design of the Proposal.
23.	The Proposal would comply with Crime Prevention Through Environmental Design principles.
24.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
25.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
26.	During construction, graffiti would be removed in accordance with Transport for NSW's Standard Requirements.
27.	All trees to be retained would be protected prior to the commencement of construction in accordance with Transport for NSW <i>Vegetation Management (Protection and Removal) Guideline</i> (2019).
28.	Temporary access arrangements should be well signed and provide a visually legible route for pedestrians.
29.	Consolidate site equipment and facilities to maximise the area of useable public realm and maintain pedestrian permeability.
30.	Minimise the visual impact of the AusGrid electrical transformer through the following: <ul style="list-style-type: none"> • minimising the area of hardstand surrounding the transformer • locating the transformer to avoid the removal of the existing vegetation which screens the adjacent residential properties • providing screening vegetation to limit views to the transformer particularly from adjacent residences and Shirley Road.
Noise and vibration	
31.	Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the ICNG and CNVS. The CNVMP would include the following: <ul style="list-style-type: none"> • a detailed noise assessment updated to consider potential noise impacts at all affected properties • 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 in 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 • restriction of heavy vehicle movements to and from the site to standard (daytime) hours where feasible and avoiding deliveries at night/evenings wherever practicable • no idling of delivery trucks • keeping truck drivers informed of designated routes, parking locations and acceptable delivery hours for the site

No.	Mitigation measure
	<ul style="list-style-type: none"> • compounds, refuelling areas and work areas designed to promote one-way traffic so that vehicle reversing movements are minimised. • 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. • maximising offset distances between noisy plant and adjacent sensitive receivers and determining safe working distances • using the most suitable equipment necessary for the construction works at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours works • use of quieter and less vibration emitting construction methods where feasible and reasonable.
32.	<p>Construction hours and scheduling as follows:</p> <ul style="list-style-type: none"> • works would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any works outside these hours may be undertaken if approved by TfNSW and the community is notified prior to these works commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the TfNSW Environment and Planning Manager for approval prior to any works outside normal hours.
33.	<p>Respite periods as follows:</p> <ul style="list-style-type: none"> • where the $LA_{eq(15\text{minute})}$ construction noise levels are predicted to exceed 75 dBA and/or 30 dB above the Rating Background Level at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with the CNVS. This would include restricting the hours that very noisy activities can occur.
34.	<p>Vibration monitoring as follows:</p> <ul style="list-style-type: none"> • to avoid structural impacts as a result of vibration or direct contact with structures, the proposed works would be undertaken in accordance with the safe work distances and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged • vibration resulting from construction and received at any structure outside of the proposal would be managed in accordance with: <ul style="list-style-type: none"> ○ for structural damage vibration - British Standard <i>BS 7385 Part 2-1993 Evaluation and measurement for vibration in buildings</i> ○ for human exposure to vibration the acceptable vibration - values set out in the <i>Environmental Noise Management Assessing Vibration: A Technical Guideline</i> (Department of Environment and Conservation, 2006) which includes British Standard <i>BS 6472:1992 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)</i> • property conditions surveys would be completed prior to any vibration intensive work being carried out at or within the minimum distances set out in the CNVS. Minimum working distances should be confirmed prior to carrying out any vibration intensive work on site • vibration-sensitive heritage structures that are potentially at risk of threshold or cosmetic damage would be identified by the contractor prior to the commencement of construction works, and confirmed as part of a CNVMP.

No.	Mitigation measure
35.	Where all reasonable and feasible construction and vibration mitigation measures have been applied and exceedances are still predicted to occur, the CNVS provides guidance on additional mitigation measures to be implemented for each receiver. Refer to Sections 5.3 and 5.4 of Technical Paper 3 for detailed implementation of additional noise and vibration management measures.
36.	<p>Limit construction noise during the Proposal including:</p> <ul style="list-style-type: none"> during site establishment (Scenario 1), temporary barriers should be erected to ensure that work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of sensitive receivers to ensure that 'line of sight' is broken, where feasible. This has the potential to reduce noise levels between 5 and 10dB limit the use of concrete saw and chainsaw where possible, and works are limited to standard hours as far as possible, and outside sensitive time periods (particularly with regard to the Tresillian centre). Where work is required outside of standard hours, the use of this equipment is to avoid sensitive periods such as after midnight and before 7.00am due to the high exceedances of NMLs during Scenarios 2 to 6, when a concrete saw is to be used near sensitive receivers it is recommended that a temporary screen or enclosure (10–15dB reduction) is placed around the works in conjunction with temporary barriers.
37.	A traffic management plan is to be prepared to manage construction noise impacts, particularly during rail possessions. This should include speed limits and circulation recommendations, measures to promote one-way traffic.
38.	<p>Minimise noise for the Tresillian centre including:</p> <ul style="list-style-type: none"> the Tresillian centre is likely to be more sensitive during certain times of the day, such as when the sleep clinic is in use. Therefore, it is recommended that consultation be undertaken with the Tresillian centre to determine feasible construction staging to manage impacts, effectively communicate likely impacts, potential periods of high intensity works, and to develop a schedule of consultation to program intensive works outside the most sensitive night time periods. Respite periods should be negotiated and a community consultation strategy developed to ensure a complaints hotline and feedback pathway is established noise intensive construction works near the Tresillian centre is to be minimised as far as reasonably possible. It is also recommended that where reasonable and feasible the use of the concrete saw is limited to standard hours or when the premises are not in use as a sleep clinic (e.g. between 7.00am and 9.00am, and 5.00pm and 6.00pm), to minimise the impact on this receiver.
Indigenous heritage	
39.	All construction staff would undergo an induction in the recognition of Indigenous cultural heritage material. This training would include information such as the importance of Indigenous cultural heritage material and places to the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites.
40.	If unforeseen Indigenous objects are uncovered during construction, the procedures contained in Transport for NSW's <i>Unexpected Heritage Finds Guideline</i> (TfNSW, 2019f) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the OEH and the Local Aboriginal Land Council.
41.	If human remains are found, work would cease, the site secured and the NSW Police and the OEH notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location.

No.	Mitigation measure
Non-Indigenous heritage	
42.	In accordance with Section 170a of the Heritage Act, Sydney Trains should provide notification of the works to Heritage Division 14 days prior to the commencement of the works.
43.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in Transport for NSW's <i>Unexpected Heritage Finds Guideline</i> (TfNSW, 2019f) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and Department of Premier and Cabinet (formerly the Heritage Division of OEH). Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.
44.	The Proposal to include a selection of compatible materials and colours: <ul style="list-style-type: none"> the colour and texture of the concrete base of the lift be selected to complement the immediate natural (adjacent rockface) and built (station buildings and bridge piers) surroundings and use of lighter mid tone colour for screens retaining walls and footpath recommended to match existing sandstone or brick walling lightweight or transparent materials (e.g. lifts, screens).
45.	The Proposal to manage trees and vegetation: <ul style="list-style-type: none"> new landscaping to offset the lost vegetation and trees including small trees and shrubs remaining trees protected during construction new landscaping compatible with existing station design including landscaping and vegetation to screen the new transformer.
46.	During detailed design, maintain three brick dish drain at the rear of Platform 2 during the regrading and resurfacing of Platform 2.
47.	Ensure that shelters and any associated structures or elements do not obscure the historic station signs.
Biodiversity	
48.	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.
49.	Trees/vegetation nominated to be removed in the Proposal plans would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through temporary protection measures.
50.	A site Environmental Representative from Transport for NSW should conduct a pre-clearance inspection to identify the presence of any active bird nests which may be erected prior to tree clearing. If identified, clearing of these trees should be postponed until the nestlings have fledged. Alternatively, a suitably qualified and licensed ecologist or spotter catcher should be engaged to relocate the nest to an appropriate location.
51.	Stockpiles, plant, equipment and materials storage would be located in existing cleared areas away from areas of native vegetation.
52.	Where the loss of trees is unable to be mitigated, Transport for NSW would replace trees removed because of the Proposal in accordance with the Transport for NSW's <i>Vegetation Offset Guide</i> (TfNSW, 2019g). It is expected that 42 trees would be required to meet this offset requirement.

No.	Mitigation measure
53.	Construction of the Proposal must be undertaken in accordance with Transport for NSW's <i>Vegetation Management (Protection and Removal) Guideline SD-111</i> (2019h) and Transport for NSW's <i>Fauna Management Guideline SD-113</i> (2019b).
54.	Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Arboricultural Impact Assessment Report (Earthscape Horticultural Services 2020). Tree protection would be undertaken in line with <i>AS 4970-2009 Protection of Trees on Development Sites</i> and would include exclusion fencing of TPZs and trunk protection.
55.	In the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
56.	If a threatened and/or protected flora or fauna species is identified during works associated with the Proposal, works near the species would stop immediately. An ecologist would be engaged to survey the area, in conjunction with Transport for NSW's Environmental Representative, to advise on management of the species on site.
57.	Should the detailed design or onsite works determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete Transport for NSW's Tree Removal Application Form and submit it to Transport for NSW for approval.
58.	For new landscaping works, mulching and watering would be undertaken until plants are established.
59.	Weed control measures, consistent with Transport for NSW's <i>Weed Management and Disposal Guideline</i> , would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction and operational phase of the Proposal. This would include the management and disposal of weeds in accordance with the <i>Biosecurity Act 2015</i> .
Socio-economic	
60.	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.
61.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
62.	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.
63.	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.
64.	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.
Soils and water	
65.	Prior to commencement of work, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the <i>'Blue Book' Managing Urban Stormwater: Soils and Construction</i> (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction.
66.	Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the works are complete and areas are stabilised.

No.	Mitigation measure
67.	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.
68.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and TfNSW's <i>Chemical Storage and Spill Response Guidelines</i> (TfNSW, 2019i).
69.	Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the Transport for NSW <i>Chemical Storage and Spill Response Guidelines</i> (TfNSW, 2019i) 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.
70.	In the event of a pollution incident, works would cease in the immediate vicinity and the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the POEO Act.
71.	The existing drainage systems would remain operational throughout the construction phase.
72.	Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the <i>Waste Classification Guidelines</i> (EPA, 2014) and Transport for NSW's <i>Water Discharge and Reuse Guideline</i> (TfNSW, 2019j).
Air quality	
73.	Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's <i>Air Quality Management Guideline</i> (TfNSW, 2019k).
74.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
75.	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.
76.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
77.	To minimise the generation of dust from construction activities, the following measures would be implemented: <ul style="list-style-type: none"> • apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) • cover stockpiles when not in use • appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading • prevent mud and dirt being tracked onto sealed road surfaces.
Waste and contamination	
78.	The CEMP must address waste management and would at a minimum: <ul style="list-style-type: none"> • identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data.

No.	Mitigation measure
79.	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.
80.	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.
81.	All waste must be classified in accordance with the <i>Waste Classification Guidelines Part 1: Classifying waste</i> (EPA, 2014) prior to disposal.
82.	Any concrete washout would be established and maintained in accordance with Transport for NSW's <i>Concrete Washout Guideline</i> – (TfNSW, 2019I) with details included in the CEMP and location marked on the ECM.
Sustainability, climate change and greenhouse gases	
83.	Detailed design of the Proposal would target a rating of 'Excellent' using the ISCA Infrastructure Sustainability Rating Scheme (v1.2).
Cumulative	
84.	Consultation and liaison would occur with North Sydney Council, Lane Cove Council, Sydney Trains and other relevant stakeholders, in order to seek to minimise cumulative construction impacts such as traffic and noise.
85.	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:

- a station that provides improved accessibility to people with a disability, limited mobility, parents/carers with prams and customers with luggage
- modernisation of the existing station building and facilities that meet the needs of a growing population
- improved access facilities for all customers using Wollstonecraft Station.

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

- increased traffic and parking demand due to impacts during rail possession periods from full closure of commuter car park and one-lane closure of Shirley Road
- moderate adverse visual impacts from vegetation and tree removal to accommodate new lifts and placement of an AusGrid electrical transformer
- noise exceedances are expected during all construction scenarios for standard-hours day period and predicted sleep disturbance; however, would be intermittent and temporary
- minor impacts to adjacent Wollstonecraft Conservation Area due to removed vegetation and introduction of new lifts and station infrastructure impacting the heritage fabric and values of the station
- temporary and minor disruptions for the community and commuters to access the station during construction and rail possession periods.

This REF has considered and assessed these impacts in accordance with clause 228 of the EP&A Regulation and the requirements of the EPBC Act (refer to Chapter 6, Appendix A and Appendix B). Based on the assessment contained in this REF, it is considered that the Proposal is not likely to significantly affect the environment. Accordingly, an EIS is not required, nor is the approval of the Minister for Planning.

The Proposal has also taken into account the principles of ESD and sustainability (refer to Section 1.1 and Section 6.13). These would be considered further during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

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- TfNSW, 2019g, Vegetation Offset Guideline (2019), Sydney.
- TfNSW, 2019h, Weed Management and Disposal Guideline, Sydney.

- TfNSW, 2019i, Chemical Storage and Spill Response Guidelines, Sydney.
- TfNSW, 2019j, Water Discharge and Reuse Guideline, Sydney.
- TfNSW, 2019k, Air Quality Management Guideline, Sydney.
- TfNSW, 2019l, Concrete Washout Guideline, Sydney.

Appendix A Consideration of matters of National Environmental Significance

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

Matters of NES	Impacts
Any impact on a World Heritage property? No World Heritage properties occur within a one-kilometre radius of the site.	Nil
Any impact on a National Heritage place? No National Heritage places occur within a one-kilometre radius of the site.	Nil
Any impact on a wetland of international importance? No wetlands of international importance are located within a one-kilometre radius of the site.	Nil
Any impact on a listed threatened species or communities? Based on available habitat and the potential impacts of the Proposal, it is unlikely that any threatened species or community will be impacted.	Nil
Any impacts on listed migratory species? No listed migratory species are likely to utilise the habitat.	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? The Proposal would not impact on a Commonwealth marine area.	Nil
Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? The Proposal is for a transport facility and does not relate to coal seam gas or mining.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not impact on Commonwealth land.	Nil

Appendix B Consideration of clause 228

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

Factor	Impacts
(a) Any environmental impact on a community? There would be some temporary impacts to the community during construction, particularly in relation to noise, traffic and access and visual amenity. Mitigation measures outlined in Table 7-1 would be implemented to manage and minimise adverse impacts.	Minor
(b) Any transformation of a locality? The Proposal would involve the introduction of new visible elements in the landscape (two new lifts, canopy, new AusGrid electrical transformer and minor adjustments/relocation of existing infrastructures). The Proposal would also contribute a positive locality by creating accessible entrances to the station and station platforms.	Moderate
(c) Any environmental impact on the ecosystem of the locality? The Proposal would require minor vegetation removal. However, given the Proposal's location within an urbanised environment and the low habitat value of the trees to be removed, impacts to biodiversity and ecosystems are expected to be minor.	Minor
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? There would be some temporary impacts during construction particularly in relation to noise, traffic and access and visual amenity (e.g. removed vegetation and trees and AusGrid electrical transformer). The Proposal would not result in any substantial reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.	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? No substantial heritage impacts are expected from the Proposal. A minor impact is expected to the adjacent Wollstonecraft Conservation Area from loss of trees and vegetation removal and installation of lift shaft would be above the surrounding landscape.	Minor
(f) Any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act 1974)? The Proposal is unlikely to have any impact on the habitat of protected fauna.	Nil
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The Proposal is unlikely to endanger any species of animal, plant or other form of life, whether 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 have any degradation on the quality of the environment.	Nil

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