NSW GOVERNMENT

Transport Access Program

Denistone Station Upgrade

Review of Environmental Factors

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

December 2021

Contents

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Abbreviations

Term	Meaning
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
APS	Access to Premises (Disability Standards)
ARI	Average Recurrence Interval
AMB	Asset Management Branch (refer to Definitions)
ASS	Acid Sulfate Soils
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CBD	Central Business District
CCTV	Closed Circuit TV
CEMP	Construction Environmental Management Plan
CLM Act	*Contaminated Land Management Act 1997* (NSW)
CNVMP	Construction Noise and Vibration Management Plan
CPTED	Crime Prevention Through Environmental Design
DAWE	Department of Agriculture, Water and the Environment (Cwlth)
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
D&C	Design & Construct
DDA	*Disability Discrimination Act 1992* (Cwlth)
DoE	Commonwealth Department of the Environment
DP&E	NSW Department of Planning and Environment
DPIE	NSW Department of Planning, Industry and Environment
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
DSI	Detailed Site Investigation (Phase II Contamination Investigation)
ECM	Environmental Controls Map
EES	NSW Environment, Energy and Science (Division of Department of Planning Industry and Environment) (formerly OEH)
EMS	Environmental Management System

Term	Meaning
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
ETS	Electronic Ticketing System
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
HV	High Voltage
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2000).
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)
IS rating	Infrastructure Sustainability rating under ISC rating tool (v 1.2)
ISC	Infrastructure Sustainability Council
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
LV	Low Voltage
NES	National Environmental Significance
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	Formerly NSW Office of the Environment and Heritage
OHWS	Overhead Wire Structure
OOHW	Out of hours work
PA system	Public Address system
PDP	Public Domain Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)

Term	Meaning
RailCorp	(former) Rail Corporation of NSW
RAP	Remediation Action Plan
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Roads Act	*Roads Act 1993* (NSW)
Roads and Maritime	NSW Roads and Maritime Services (formerly Roads and Traffic Authority)
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
SoHI	Statement of Heritage Impact
TAHE	Transport Asset Holding Entity of New South Wales (refer to definitions)
TCP	Traffic Control Plan
tactiles	Tactile Ground Surface Indicators (“tactiles”)
TMP	Traffic Management Plan
TPZ	Tree Protection Zone
TVM	Ticket Vending Machine
UDP	Urban Design Plan
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
WM Act	*Water Management Act 2000* (NSW)

Definitions

Term	Meaning
Average Recurrence Interval	The likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100-years.
Asset Management Branch	The Asset Management Branch (formerly Asset Standards Authority - ASA) is a part of Transport for NSW, and responsible for engineering governance, assurance of design safety, and ensuring the integrity of transport and infrastructure assets. Within the rail environment, Design Authority functions formerly performed by ASA are now exercised by the Asset Management Branch.
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
Design and Construct Contract	A method to deliver a project in which the design and construction services are contracted by a single entity known as the Contractor. The Contractor completes the project by refining the concept design presented in the REF and completing the detailed design so that it is suitable for construction (subject to Transport for NSW acceptance). 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).
Disability Standards for Accessible Public Transport	The Commonwealth *Disability Standards for Accessible Public Transport 2002* ("Transport Standards") (as amended) are a set of legally enforceable standards, authorised under the Commonwealth *Disability Discrimination Act 1992* (DDA) for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Ecologically Sustainable Development	As defined by clause 7(4) Schedule 2 of the EP&A Regulation. Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.
Feasible	A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.
Interchange	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.
Noise sensitive receiver	In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (e.g. schools, TAFE colleges), health care facilities (e.g. nursing homes, hospitals), recording studios and places of worship/religious facilities (e.g. churches).

Term	Meaning
NSW Trains	From 1 July 2013, NSW Trains became the new rail provider of services for regional rail customers.
Opal card	The integrated ticketing smartcard being introduced by Transport for NSW.
Out of hours work	Defined as work *outside* standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act - in this instance, Transport for NSW.
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 block of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Reasonable	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.
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.
TAHE	The Transport Asset Holding Company is a statutory State-Owned Corporation that holds rail property assets, rolling stock and rail infrastructure in the Sydney metropolitan area and limited country locations in the State of NSW
Tactiles	Tactile tiles or Tactile Ground Surface Indicators (tactiles) are textured ground surface indicators to assist pedestrians who are blind or visually impaired. They are found on many footpaths, stairs and train station platforms.
The Proposal	The construction and operation of the Denistone Station Upgrade.
Vegetation Offset Guide	The Transport for NSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 5.5 of the EP&A Act. z The Guide provides for planting of a minimum of eight trees for each large tree with a diameter at breast height (DBH) of more than 60 cm, four trees where the DBH is 15-60 cm, or two trees where DBH is less than 15 cm.

Executive summary

Overview

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

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

The Proposal would provide:

- two new lifts and landings to provide access between the existing station concourse and the platforms
- reconfiguration of the existing bathrooms on Platform 1/2 to accommodate:
    - a new family accessible toilet
    - a unisex ambulant toilet
    - a store room
- alterations to the existing waiting room on Platform 1/2 to provide DDA / DSAPT compliant access and a cabinet for the main electrical switch board
- a lowered floor within the Platform 3/4 waiting area to provide compliant access (existing seating to be reinstated)
- provision of new canopies and seating at the boarding assistance zones on Platform 1/2 and 3/4
- upgrade of the existing stairs to include adjustment of stair nosings, new compliant handrails and tactile ground surface indicators (tactiles)
- regrade the existing platform surfaces as required, to provide accessible paths from the new lifts to the station amenities and improve accessibility at the base of the existing stairs
- reinstatement of the original art deco style awning on the station concourse building facing Gordon Crescent
- installation of a new concrete slab on the northern side of the station entrance to extend across the current void space to allow for relocation of the existing bins. New perforated metal screens would also be installed to surround the new area of concrete
- station interchange upgrades including:
    - upgrade of the existing footpaths including regrading and widening paths between the station entrance and existing Gordon Crescent car park
    - one new DDA car space in the existing Gordon Crescent commuter car park and adjustment and regrading of the car park surface, including new line marking as required
    - a new kiss and ride bay with new kerb ramp, bench and landscaping

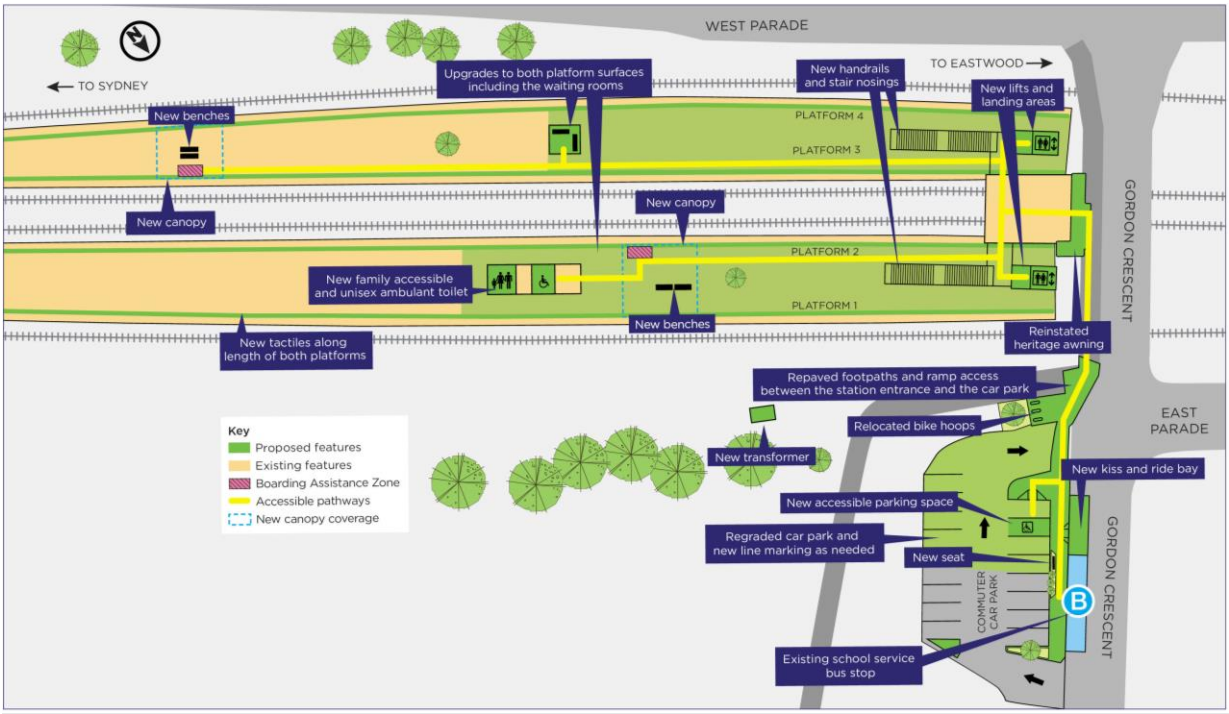
- minor work including adjustments to station lighting, relocation of electronic ticketing (Opal readers), relocation or replacement of existing customer facilities (drinking fountain, vending machine, waste and recycling bins and seating), improvement to station communications systems (including CCTV cameras), hearing loops, wayfinding signage and installation of yellow lines and tactiles.

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

This Review of Environmental Factors (REF) has been prepared to assess all matters affecting or likely to affect the environment by reason of the construction and operation of the Proposal under the provisions of Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Subject to approval, construction is expected to commence in early 2022 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 below.



(Indicative only, subject to detailed design)

Figure ES-1 Key features of the Proposal

Need for the Proposal

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

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

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

Community and stakeholder consultation

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 5.4 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 Sydney Trains, Transport for NSW and City of Ryde Council during the development of design options and the preferred option. Consultation with these stakeholders would continue through the detailed design and construction of the Proposal.

Feedback can be sent to:

- projects@transport.nsw.gov.au
- Transport Access Program – Denistone Station Upgrade
  Associate Director Environmental Impact Assessment
  PO Box K659
  Haymarket NSW 1240

Or submitted:

https://www.nsw.gov.au/have-your-say/denistone-station-accessibility-upgrades

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.

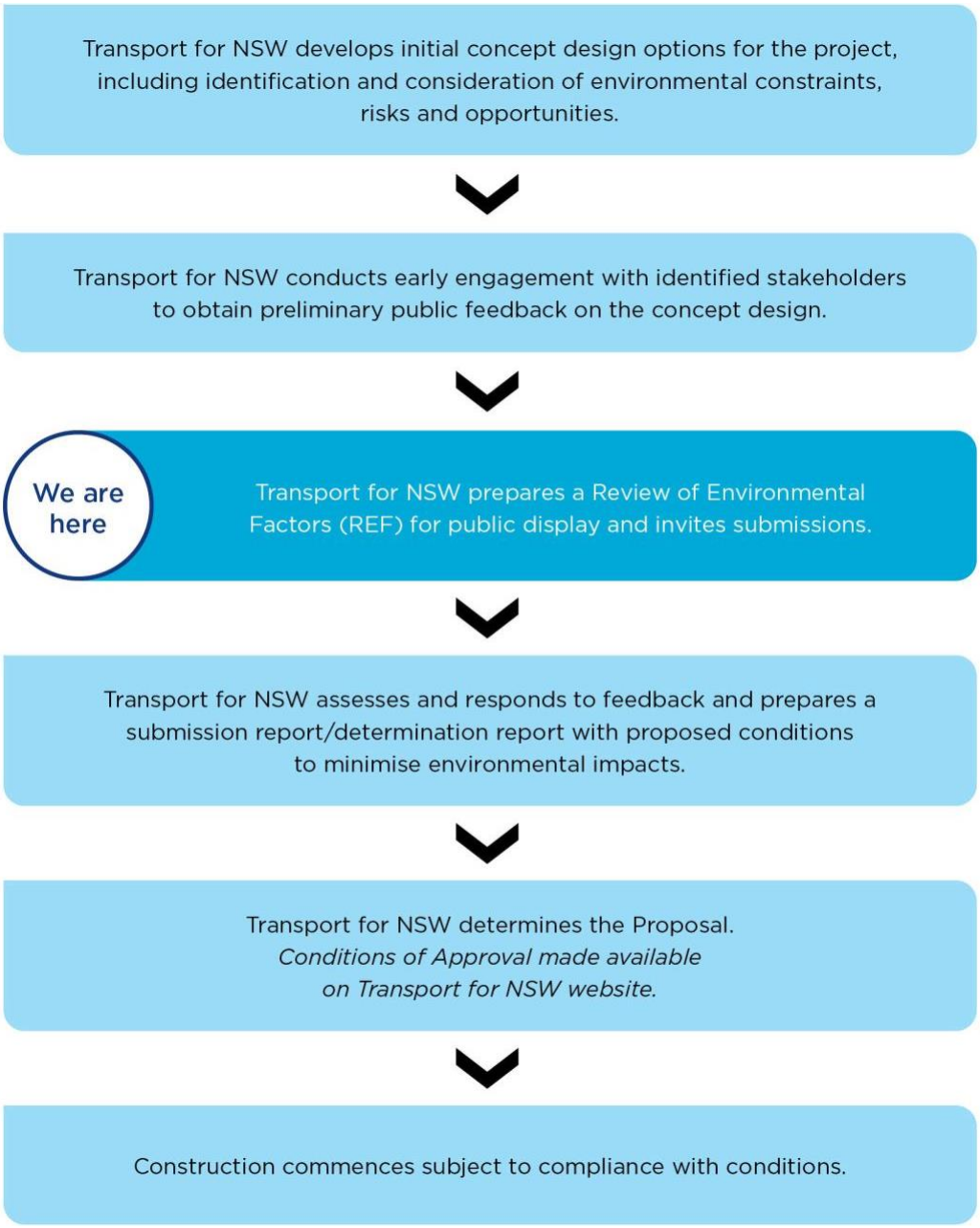


Figure ES-2 Planning approval and consultation process for the Proposal

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
- modernisation of the existing station building and facilities to meet the needs of a growing population
- reinstatement of the art deco awning on the station concourse building facing Gordon Crescent resembling the original heritage fabric of the building
- improved interchange and access facilities for all customers utilising Denistone Station.

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

- temporary adverse impacts to the visual amenity of the local environment due to the construction works associated with the Proposal
- temporary impacts on local traffic flow associated with construction traffic along Gordon Crescent
- temporary disruptions to station facilities and amenities during construction, including potential weekend closures of Denistone Station during scheduled Sydney Trains rail shutdowns
- temporary changes to vehicular, bus and pedestrian access around the station during construction
- temporary loss of up to around 10 car parks in the Council-managed Kinson Crescent car park to accommodate a construction compound and laydown area
- temporary noise impacts to adjacent residential areas during construction, including periods of weekend works
- potential sediment mobilisation, dust generation and erosion risk during construction
- impacts to the heritage fabric as a result of the construction of the Proposal including impacts to the footbridge, booking office and station platform buildings
- minor changes to the overall built form of the station during operation, noting most of these changes are expected to result in negligible visual impacts during operation
- minor impacts to the existing station building and visual environment from the introduction of new elements, such as the new lifts

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

Conclusion

This REF has been prepared having regard to sections 5.5 and 5.7 of the EP&A Act, and clause 228 of the EP&A Regulation, to ensure that Transport for NSW takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

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

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

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

Photomontage examples of the Proposal are shown in Figure ES-3 and Figure ES-4.

(Indicative only, subject to detailed design)

Figure ES-3 Artists impression

(Indicative only, subject to detailed design)

Figure ES-4 Artists impression

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 Denistone Station Upgrade (the 'Proposal').

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

The NSW Government is committed to facilitating and encouraging use of public transport, such as trains, by upgrading stations to make them more accessible, and improving interchanges around stations with other modes of transport such as buses, bicycles and cars. The Transport Access Program is an initiative targeted at achieving compliance with the Disability Standards for Accessible Public Transport (DSAPT) Regulations across the Network.

Denistone Station has been identified for an accessibility upgrade as it does not currently accommodate mobility impaired access to rail services or meet key requirements of the DSAPT or the Commonwealth *Disability Discrimination Act 1992* (DDA).

The following accessibility issues have been identified at Denistone Station and have been addressed in the design of the upgrade:

- access to the station building and platforms is currently via stairs only and does not provide accessibility on to the platforms for people with mobility restrictions
- the existing toilets within the station building do not include provision of a family accessible toilet or ambulant toilet
- the existing treads, handrails, tactile ground surface indicators (tactiles) and nosing on the stairs are non-compliant with DDA standards
- areas of the existing platform grade, including the access into the toilets, are non-compliant with DDA standards
- the existing platform edge safety zone line markings and tactiles are non-compliant with DDA standards
- other issues including the lack of hearing loops, accessible water fountain and seating at the station
- the station does not currently provide any DDA compliant car parking spaces.

1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- two new lifts and landings to provide access between the existing station concourse and the platforms
- reconfiguration of the existing bathrooms on Platform 1/2 to accommodate:
    - a new family accessible toilet
    - a unisex ambulant toilet
    - a store room

- alterations to the existing waiting room on Platform 1/2 to provide DDA / DSAPT compliant access and a cabinet for the main electrical switch board.
- a lowered floor within the Platform 3/4 waiting area to provide compliant access (existing seating to be reinstated)
- provision of new canopies and seating at the boarding assistance zones on Platform 1/2 and 3/4
- upgrade of the existing stairs to include adjustment of stair nosings, new compliant handrails and tactile ground surface indicators (tactiles)
- regrade the existing platform surfaces as required, to provide accessible paths from the new lifts to the station amenities and improve accessibility at the base of the existing stairs
- reinstatement of the original art deco style awning on the station concourse building facing Gordon Crescent
- installation of a new concrete slab on the northern side of the station entrance to extend across the current void space to allow for relocation of the existing bins. New perforated metal screens would also be installed to surround the new area of concrete
- station interchange upgrades including:
    - upgrade of the existing footpaths including regrading and widening paths between the station entrance and existing Gordon Crescent car park
    - one new DDA car space in the existing Gordon Crescent commuter car park and adjustment and regrading of the car park surface, including new line marking as required
    - a new kiss and ride bay with new kerb ramp, bench and landscaping
- minor work including adjustments to station lighting, relocation of electronic ticketing (Opal readers), relocation or replacement of existing customer facilities (drinking fountain, vending machine, waste and recycling bins and seating), improvement to station communications systems (including CCTV cameras), hearing loops, wayfinding signage and installation of yellow lines and tactiles.

Subject to approval, construction is expected to commence in early 2022 and take around 18 months to complete.

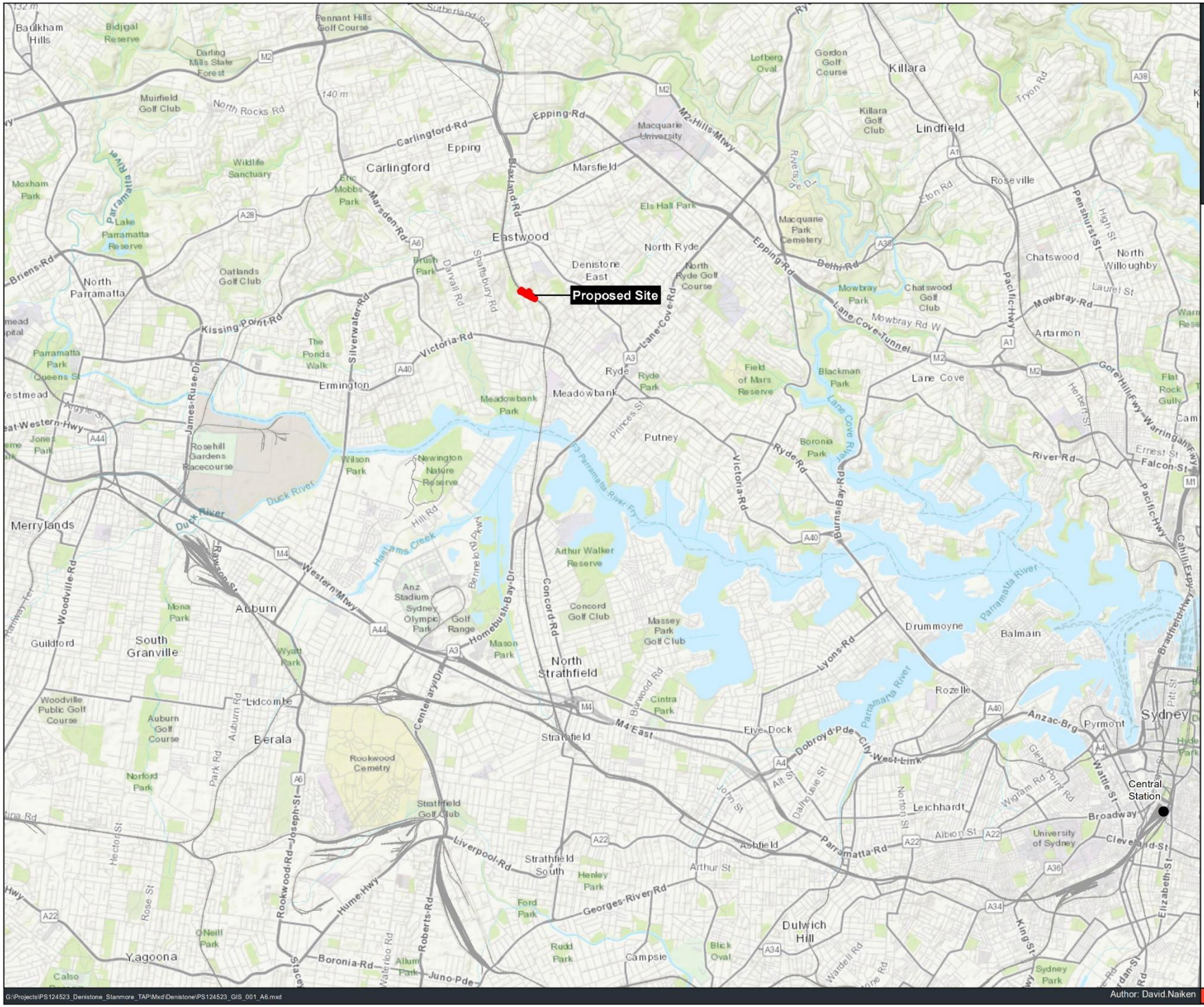
A detailed description of the Proposal is provided in Chapter 3 of this Review of Environmental Factors (REF).

1.2 Location of the Proposal

Denistone Station is located on the North Shore line (T9 Service), about 20 kilometres north-west by rail from Central Station. It is within the City of Ryde local government area (LGA) in Sydney's north-west. The suburb of Denistone consists of predominantly low-density residential housing with no commercial activity in the immediate surrounds of the station.

The Proposal study area is generally bounded by Gordon Crescent to the north and west, West Parade to the south and Symons Reserve to the north. Ryde Hospital is located approximately 500 metres to the north-east. The Proposal includes upgrades to Denistone Station on land owned by the Transport Asset Holding Entity of NSW (TAHE), and managed by Sydney Trains within the station precinct, with some work also proposed along the adjoining footpaths and car parks which are managed by City of Ryde Council.

The regional location of the Proposal is shown in Figure 1-1.



Transport Access Program - Denistone Station

Figure 1-1
Regional Context Map

Legend

- Roads
- Railway
- Watercourses
- Proposal site

Coordinate system: GDA2020 MGA Zone 56

Scale ratio correct when printed at A3

1:65,000 Date: 05-Nov-21

Data Sources: Imagery © Metromap 2020

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Author: David.Naiken

1.3 Existing infrastructure and land uses

1.3.1 Station access and facilities

Denistone Station consists of two island platforms containing four platforms which are accessed via a single pedestrian and road bridge that provides cross-rail corridor connectivity and access to Gordon Crescent. Access to the platforms is via the existing pedestrian bridge (Gordon Crescent) and concourse and stairs.

The pedestrian infrastructure surrounding the station includes footpaths on the station side of Gordon Crescent and the adjacent Gordon Crescent commuter car park to the north. The southern side of the station includes footpaths to the carpark along Kinston Crescent and footpaths on the southern side of West Parade providing access to the surrounding residential areas.

Access to the station from the north along Gordon Crescent generally slopes downhill from high points north of the station and slopes towards the south along East Parade and Gordon Crescent. Accessing the station from the south includes inclined slopes up West Parade (from both the east and west approaches) towards Gordon Crescent. The station platforms are below Gordon Crescent and are located within a rail cutting that taper away from the station entrance towards the south and east.

Platforms 1 and 2 provide access from Denistone to the city via Strathfield with services primarily departing from Platform 2 while Platforms 3 and 4 provide access from Denistone to Hornsby.

A station building entrance is located on Gordon Crescent and contains staff offices and storage, a ticket booking office, Opal card machine, telephone booth, two platform indicators, four fixed location readers and rubbish bins. Attached to the station building is the concourse and pedestrian footbridge with a dual stairway attached leading to the platforms.

A station building located between Platforms 1 and 2 provides facilities including an indoor waiting room, male and female toilets, a drinking fountain, weather protection canopies and an emergency help point.

Between Platforms 3 and 4, a small station building contains two benches providing seating and weather protection. Customer seating and real time passenger information displays are located on each platform.

Denistone Railway Station Group is listed on the TAHE Section 170 Heritage and Conservation Register. Denistone Station is of local significance as one of a number of inter-war railway stations in NSW that collectively demonstrate changes taking place in society between the wars, a time of great social upheaval in the aftermath of World War 1 and the Great Depression, with World War II looming. Denistone is the only station of its type in NSW that has retained all of its original design elements, in largely unmodified form and in a setting of domestic housing of a similar period and scale. This assists with retaining its historic setting with a rare and exceptional degree of integrity.

1.3.2 Interchange facilities

An existing, sealed commuter car park containing around 21 spaces is located immediately north of Denistone Station, with separate entry and exit access available from Gordon Crescent. No DDA parking provisions are currently provided within this car park.

An additional commuter carpark is located about 130 metres north-west of the station on Kinson Crescent. This carpark also does not provide DDA parking (note: no works to this car park are proposed as part of the Proposal). Street parking is available on West Parade to the south of the station and Gordon Crescent to the north.

Three bicycle hoops are provided on the northern side of the station, adjacent to the existing Gordon Crescent commuter car park.

Informal kiss and ride zones exist on the northern and southern side of Denistone Station, with dedicated 'No Parking' areas on East Parade, West Parade and Gordon Crescent.

The nearest bus stop is a school service bus stop next to the commuter carpark on Gordon Crescent. The next nearest bus stop which services the station is located on East Parade, about 900 metres north of Denistone Station. The stop provides services between Eastwood and Ryde, via Blaxland Street (bus route 515). To the south, the nearest bus stop is located along Victoria Road to the west of West Parade, about 1.1 kilometres from Denistone Station. The stop provides services between Parramatta and Central, via Victoria Road (bus route 501).

The site location of Denistone Station is shown in Figure 1-2. Photos of the existing station infrastructure are shown in Figure 1-3 to Figure 1-7. A photo of the existing Gordon Crescent commuter car park is shown in Figure 1-8.

1.3.3 Land uses

The suburb of Denistone comprises single dwellings, townhouses, local parks, open space and recreation facilities. Ryde Hospital is located around 500 metres to the north-east.

The local area to the north of the station comprises detached residential houses, Symons Reserve and Ryde Hospital. The local area to the south of the station comprises detached houses, Darvall Park, Miriam Park, Denistone Sports Club with three bowling greens and the West Ryde shopping precinct.

Darvall Park contains Blue Gum High Forest that has been restored by volunteers since 2002. Darvall Park runs perpendicular to the rail line from close to Eastwood shopping centre in the north to Denistone Sports Club in the south and provides playground facilities and walkways.

Land use surrounding Denistone Station are predominantly residential single dwelling houses with some townhouse developments.

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Transport Access Program - Denistone Station

Figure 1-2
Site Locality Map

Legend

- Railway station
- Railway
- Roads
- Proposal site

0 20 40 m

Coordinate system: GDA2020 MGA Zone 56

Scale ratio correct when printed at A3

1:1,500 Date: 05-Nov-21

Data Sources: Imagery © Metromap 2020

Figure 1-3 View of existing entrance from Gordon Crescent bridge

Figure 1-4 View towards station buildings and entrance from Platform 1/2

Figure 1-5 View towards Platform 1/2 on the left and Platform 3/4 on the right from the top of the stairs

Figure 1-6 View of the existing platform building (existing toilets and store room) on Platform 1/2

Figure 1-7 View of the existing waiting room on Platform 3/4

Figure 1-8 View of the existing car park on Gordon Crescent

1.4 Purpose of this Review of Environmental Factors

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

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

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

Having regard to the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), this REF considers the potential for the Proposal to have a significant impact on matters of National Environmental Significance (NES) or Commonwealth land, and the need to make a referral to the Commonwealth Department of Agriculture, Water and the Environment for any necessary approvals under the EPBC Act. Refer to Chapter 3 for more information on statutory considerations.

2 Need for the Proposal

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

2.1 Strategic justification

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

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

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

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

Policy / Strategy	Overview	How the Proposal aligns
Future Transport Strategy 2056 (Transport for NSW, 2018)	*Future Transport 2056* is an update of NSW's *Long Term Transport Master Plan*. It is a suite of strategies and plans for transport to provide an integrated vision for the state. *Future Transport 2056* identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport.	The Proposal would deliver on the customer focus, accessible services and sustainability outcomes of the *Future Transport Strategy 2056*. The Proposal would deliver on the customer focus and support accessible services (Outcome 5) by improving accessibility to public transport and creating travel options for more customers. The Proposal would also support the sustainability objective (Outcome 6) by encouraging the use of public transport and helping to reduce the number of cars on the roads, resulting in (net) less emissions.
Disability Inclusion Action Plan (2018-2022) (Transport for NSW, 2017)	The *Disability Inclusion Action Plan 2018-2022* was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, which consists of representatives from peak disability and ageing organisations within NSW. The Disability Plan identifies 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 the *Disability Inclusion Action Plan* and seeks to improve and provide equitable access to public transport facilities. The Proposal would include new lift access to the station platforms, improved pedestrian access, accessible and ambulant bathrooms and one new accessible parking spaces.

Policy / Strategy	Overview	How the Proposal aligns
A Metropolis of Three Cities – Greater Sydney Region Plan (Greater Sydney Commission, 2018a)	The *Greater Sydney Region Plan* is the NSW Government's 40-year land use plan for Sydney. It establishes a vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City. The site is at the western edge of the Northern District which is part of the Eastern Harbour City.	The Proposal would particularly support Objective 6 of the Plan, which is to ensure services and infrastructure meet communities' changing needs. The Proposal would be consistent with this objective by providing additional infrastructure to support future growth to transport services for commuters and improved connectivity to Denistone Station and public transport opportunities for surrounding suburbs.
Building Momentum – State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)	The *State Infrastructure Strategy 2018-2038* makes recommendations for each of NSW's key infrastructure sectors, including transport.	The Proposal would support ongoing investment in rail infrastructure and would align with the need to continue to provide public transport to support Sydney's increasing population.
North District Plan – connecting communities (Greater Sydney Commission, 2018b)	The Proposal is located within the North District Plan which, among other northern local government areas (LGA), applies to the City of Ryde LGA. The plan described the planning priorities and actions to improve liveability and achieve a productive and sustainable future for the district.	The Proposal would support both Planning Priority N1 (Planning for a city supported by infrastructure) and Planning Priority N3 (Providing services and social infrastructure to meet people's changing needs). The Proposal would assist in meeting the challenges of changing demographics for the Denistone precinct by investing in infrastructure which supports public transport access for people of all ages and abilities.
NSW: Premier Priorities *(NSW Government, 2019)* *https://www.nsw.gov.au/improving-nsw/premiers-priorities/*	In June 2019, 14 new Premier's Priorities were announced that would allow the Government to measure and deliver in areas where NSW can do better. The key policy priorities, include the following: • a strong economy • highest quality education • well-connected communities with quality local environments • putting customer at the centre of everything we do • breaking the cycle of disadvantage	The Proposal would assist in meeting the key priority to develop well connected communities with quality local environments by investing in transport infrastructure and improving accessibility to public transport and encouraging greater use of public transport.

Policy / Strategy	Overview	How the Proposal aligns
Ryde Local Strategic Planning Statement 2020 *(City of Ryde, 2020)*	The Ryde Local Strategic Planning Statement 2020 is intended to guide future local planning priorities, decisions and actions within the City of Ryde. Of relevance to the proposal are Part 2, Part 3 and Part 5, briefly outlined below. ***Part 2: Infrastructure and collaboration*** One of the planning priorities in this part is to *provide sufficient infrastructure to support current and future population growth (s.2.2.5).*	The Proposal would improve access to the station and platforms through the provision of new infrastructure. This new access would support the current and future population of Ryde. The Proposal would include two new lifts that would provide access to public transport for a range of users and mobility levels.
	Part 3: Liveability – Design Excellence & Place-making One of the aims of this part is that *All development activity in the City of Ryde will showcase design excellence, contributing positively to the natural, cultural, visual and architectural character of the City (s.3.5.1).*	The Proposal would improve the character of the station and streetscape environment through improvements to the station entrance and platforms. This would include a more spacious station entry with new lifts, new paving, balustrades, furniture, signage and lighting. The original the art deco style awning and fascia design of the station concourse building would be reinstated, improving the visual and architectural character of the station entrance.
	Part 5: Sustainability – Environment One of the aims of this part is: *To increase 'urban tree canopy cover' through actions such as implementing the City of Ryde Street Tree Master Plan (City of Ryde, 2013)*	The Proposal would not require the removal of any trees. This includes the existing trees and gardens on the platforms which would remain. The Proposal includes the provision of two new trees that would be located at the Gordon Crescent commuter car park, contributing to an increase in the tree canopy in this location.
Disability Inclusion Action Plan *(City of Ryde Council, 2017)*	This Plan aims to ensure a whole of Council approach to effectively provide for the diverse needs of people with a disability in the City of Ryde community and so that people living with a disability have access to information and relevant services.	The Proposal would assist in meeting the overall objectives of this Plan. In particular, one of the key actions of the plan (Action 1k) is to 'work with Transport [for] NSW to make major transport infrastructure in [the] Ryde LGA more accessible and disability friendly with ramps and lifts, bus interchanges improved signage'. The scope of works proposed would assist in achieving this at Denistone 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 where it is needed most. The program aims to provide:

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

2.3 Objectives of the Proposal

The specific objectives of the Denistone Station Upgrade are to:

- provide a station that is accessible to those with a disability, the ageing and parents/carers with prams and customers with luggage
- improve overall customer experience by improving accessibility for those with mobility issues (including increased access to station facilities such as the toilets, drinking fountain and accessible parking spaces)
- improve customer safety
- improve wayfinding in and around the station
- improve customer amenity
- improve pedestrian links to Gordon Crescent
- respond to the heritage values of the site.

2.4 Design development

In 2019, Stantec was engaged to prepare a *Scoping Design Report* (Stantec, 2019).
The report identified the following key access constraints and issues at Denistone Station:

- access to Denistone Station is via stairs only and does not provide accessibility for wheelchairs or people with mobility issues
- accessible parking spaces are not currently provided in the existing Gordon Crescent commuter car park
- the pathway from the Gordon Crescent commuter car park to the station is non-compliant due to steep grades
- the existing hand railing and nosing on the platform stairs is non-compliant
- no family accessible toilet is provided

- existing waiting areas are not accessible due to changes in existing floor height with the platform surface
- tactile indicators on existing stairs and platform edge do not comply with current / applicable standards.

2.5 Alternative options considered

Two design options were developed for Denistone Station. The options were initially derived from a desktop assessment of physical site constraints and a review of preliminary options developed. Enhanced and/or modified versions of these options were then discussed and workshopped at a Preliminary Ideas Workshop between the design team and Transport for NSW.

2.5.1 The 'do-nothing' option

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

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

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

2.5.2 Assessment of identified options

All options were quantitatively and qualitatively assessed using Transport for NSW's multicriteria analysis (MCA) framework. The options were assessed quantitatively by comparing the Whole-of-Life costs for each option. Each option was then assessed against multiple pre-determined non-cost criteria provided by Transport for NSW.

The design options assessed in the MCA included consideration of factors such as customer experience, accessibility, engineering constraints, heritage and environment, modal integration and cost.

Two options were prepared as part of the *Scoping Design Report* (Stantec, 2019). Both options were substantially the same design, with the exception of the family accessible toilet location. Design elements that were consistent across the two options included the following upgrades:

- achieving compliance to DSAPT standards through the provision of two lifts to the existing footbridge/concourse located between the footbridge and road bridge
- extension to the concourse to provide a wider station entry from the existing footpath
- two DDA car parking spaces at the existing Gordon Crescent commuter car park adjacent to the station.
- footpath from the Gordon Crescent car park to the road bridge to be upgraded to provide complying grades
- a new kiss and ride bay would be provided along the street front adjacent to the Gordon Crescent commuter car park
- all stairs would be upgraded with new compliant handrailing, tactiles and nosing
- convert existing male toilet into male and female ambulant toilet
- Platform 1/2 would be regraded from the new lift entry to the existing waiting area

- Platform 3/4 would be regraded from the new lift entry to the existing waiting area
- existing floor slab of the waiting room on Platform 3/4 to be lowered.

Option 1 included the modification of the existing female toilet to accommodate a family accessible toilet and a storeroom on Platform 1/2. Option 2 provided for a family accessible toilet as an extension of the station building at the western end of Platform 1/2.

2.6 Justification for the preferred option

The preferred option was determined to be Option 1. Given the existing layout and site constraints of Denistone Station, the options were considered of a similar nature. Overall, Option 1 scored higher in the deliverability category compared to Option 2.

Subsequent to the MCA workshop, it was decided to adjust the use of the rooms in the building on Platform 1/2 to include a new opening through the western end of the building to achieve level access to the waiting room and a new family accessible toilet. The existing female toilet was also identified for modification to accommodate the family accessible toilet and a store room. This was to ensure minimum impact on the existing heritage fabric within the platform building.

Further design development included:

- reducing the extent of the concourse extensions to reduce new structures to lift landings in order to reduce heritage impacts
- provision of new platform canopies at the boarding assistance zones in order to improve customer amenity
- reducing the number of DDA parking spaces in the Gordon Crescent car park to one to meet customer parking requirements

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

3 Proposal description

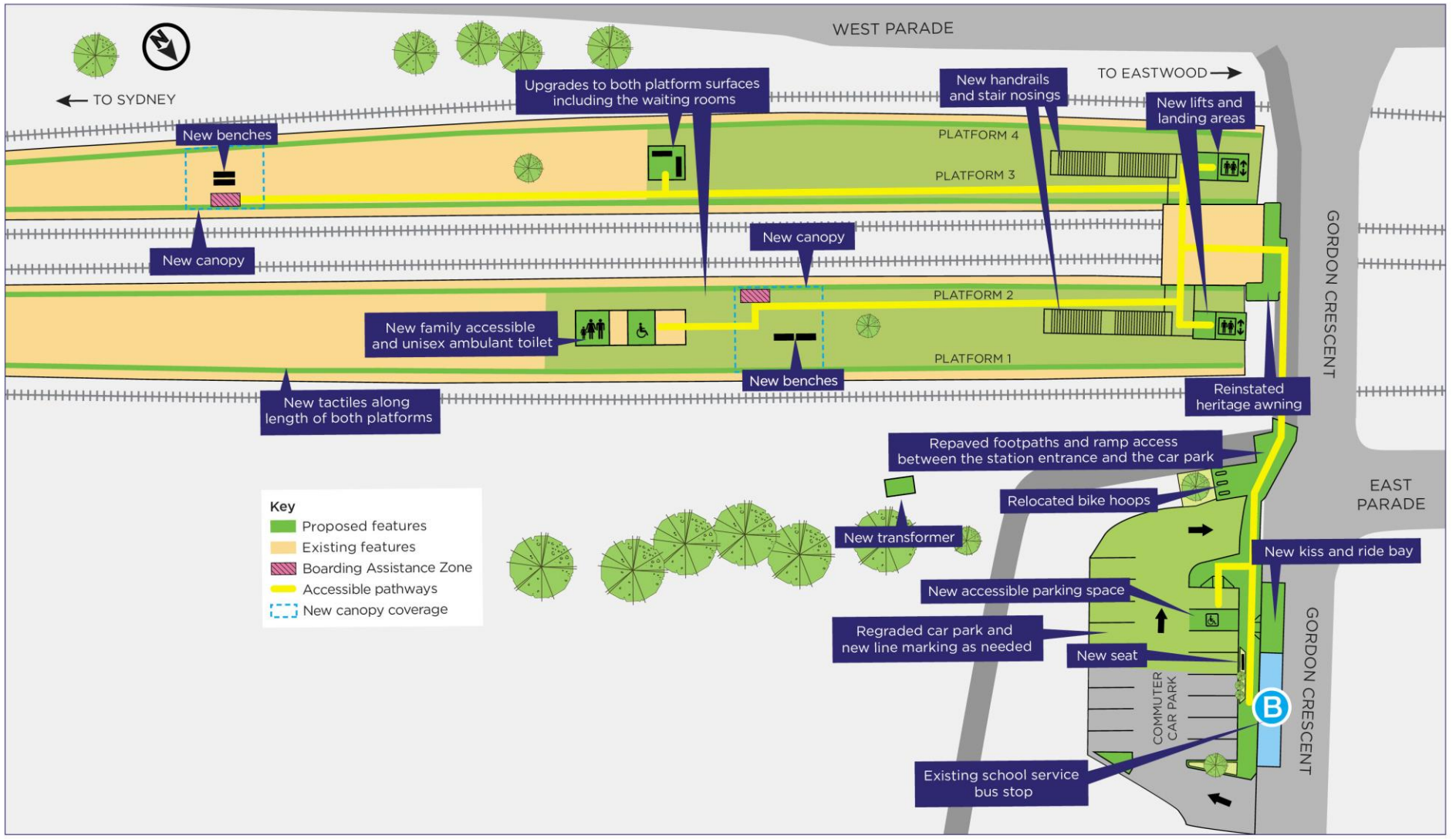
Chapter 3 describes the Proposal and summarises key design parameters, construction method, and associated infrastructure and activities. The description of the Proposal is based on the concept design and is subject to detailed design.

3.1 The Proposal

The Proposal would include the following key elements:

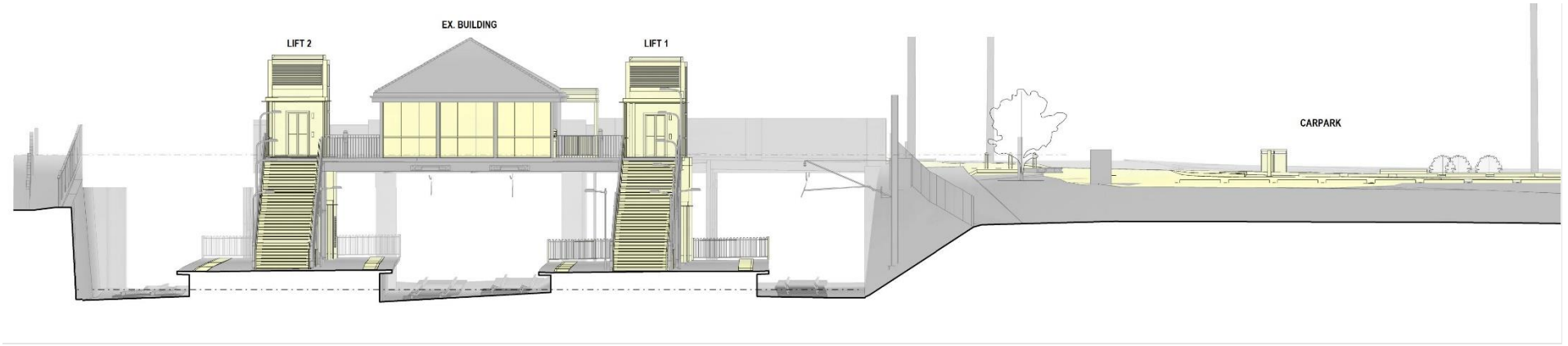
- two new lifts and landings to provide access between the existing station concourse and the platforms
- reconfiguration of the existing bathrooms on Platform 1/2 to accommodate:
    - a new family accessible toilet
    - a unisex ambulant toilet
    - a store room
- alterations to the existing waiting room on Platform 1/2 to provide DDA / DSAPT compliant access and a cabinet for the main electrical switch board.
- a lowered floor within the Platform 3/4 waiting area to provide compliant access (existing seating to be reinstated)
- provision of new canopies and seating at the boarding assistance zones on Platform 1/2 and 3/4
- upgrade of the existing stairs to include adjustment of stair nosings, new compliant handrails and tactile ground surface indicators (tactiles)
- regrade the existing platform surfaces as required, to provide accessible paths from the new lifts to the station amenities and improve accessibility at the base of the existing stairs
- reinstatement of the original art deco style awning on the station concourse building facing Gordon Crescent
- installation of a new concrete slab on the northern side of the station entrance to extend across the current void space to allow for relocation of the existing bins. New perforated metal screens would also be installed to surround the new area of concrete
- station interchange upgrades including:
    - upgrade of the existing footpaths including regrading and widening paths between the station entrance and existing Gordon Crescent car park
    - one new DDA car space in the existing Gordon Crescent commuter car park and adjustment and regrading of the car park surface, including new line marking as required
    - a new kiss and ride bay with new kerb ramp, bench and landscaping
- minor work including adjustments to station lighting, relocation of electronic ticketing (Opal readers), relocation or replacement of existing customer facilities (drinking fountain, vending machine, waste and recycling bins and seating), improvement to station communications systems (including CCTV cameras), hearing loops, wayfinding signage and installation of yellow lines and tactiles.

Figure 3-1 shows the general layout of key elements for the Proposal. Figure 3-2 to Figure 3-6 provide indicative elevations of the Proposal.



Source: DesignInc, 2021 *(Indicative only, subject to detailed design)*

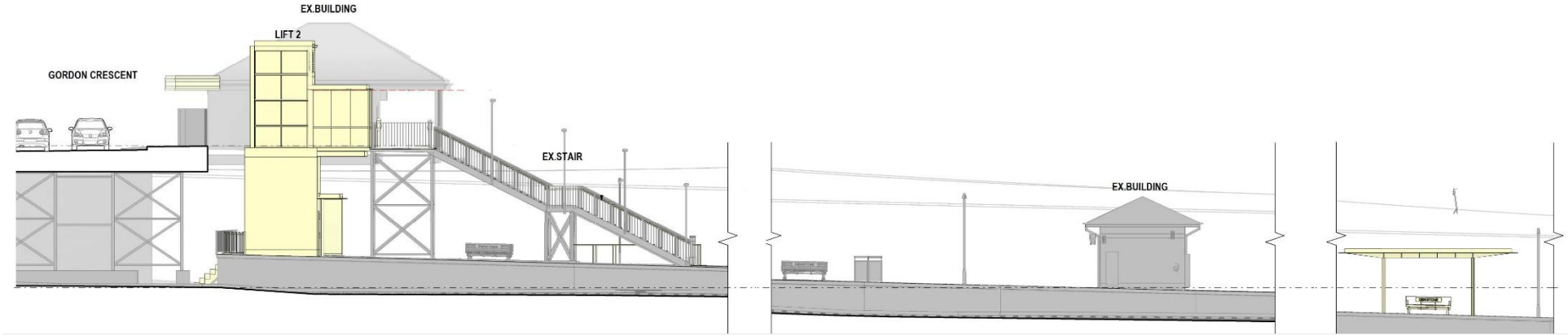
Figure 3-1 Overview of proposed upgrades



Source: DesignInc, 2021

(Indicative only, subject to detailed design)

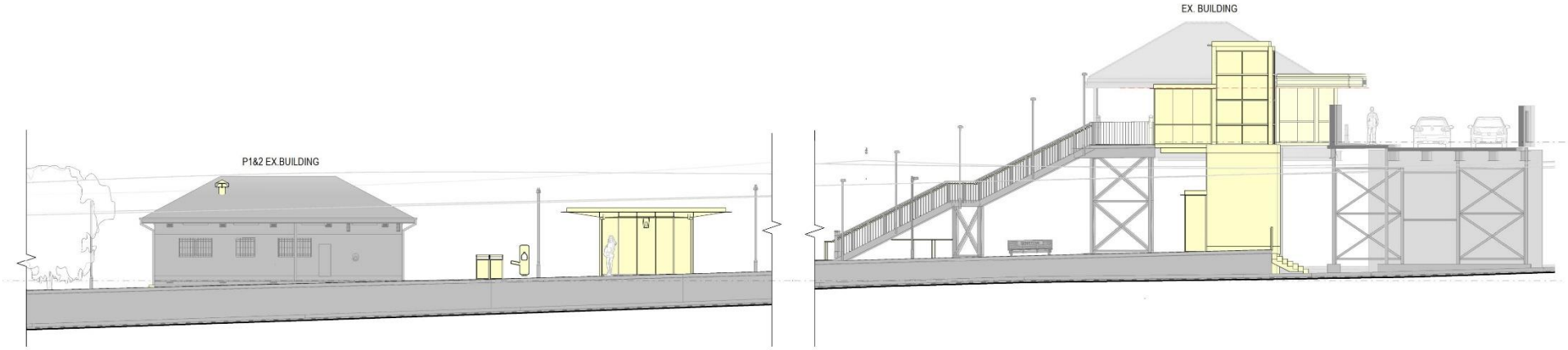
Figure 3-2 Indicative elevation of the Proposal looking west



Source: DesignInc, 2021

(Indicative only, subject to detailed design)

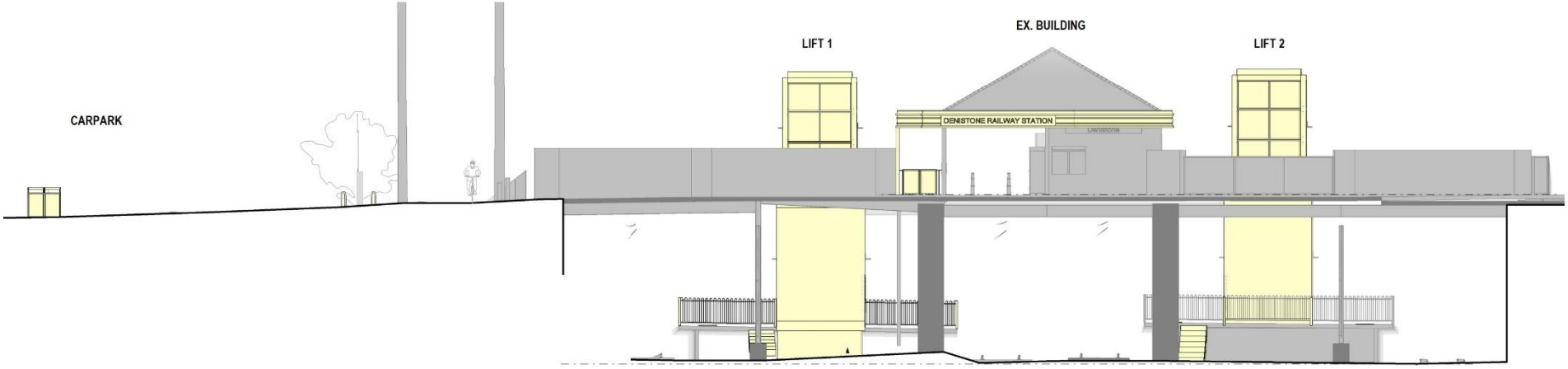
Figure 3-3 Indicative elevation of the Proposal looking north



Source: DesignInc, 2021

(Indicative only, subject to detailed design)

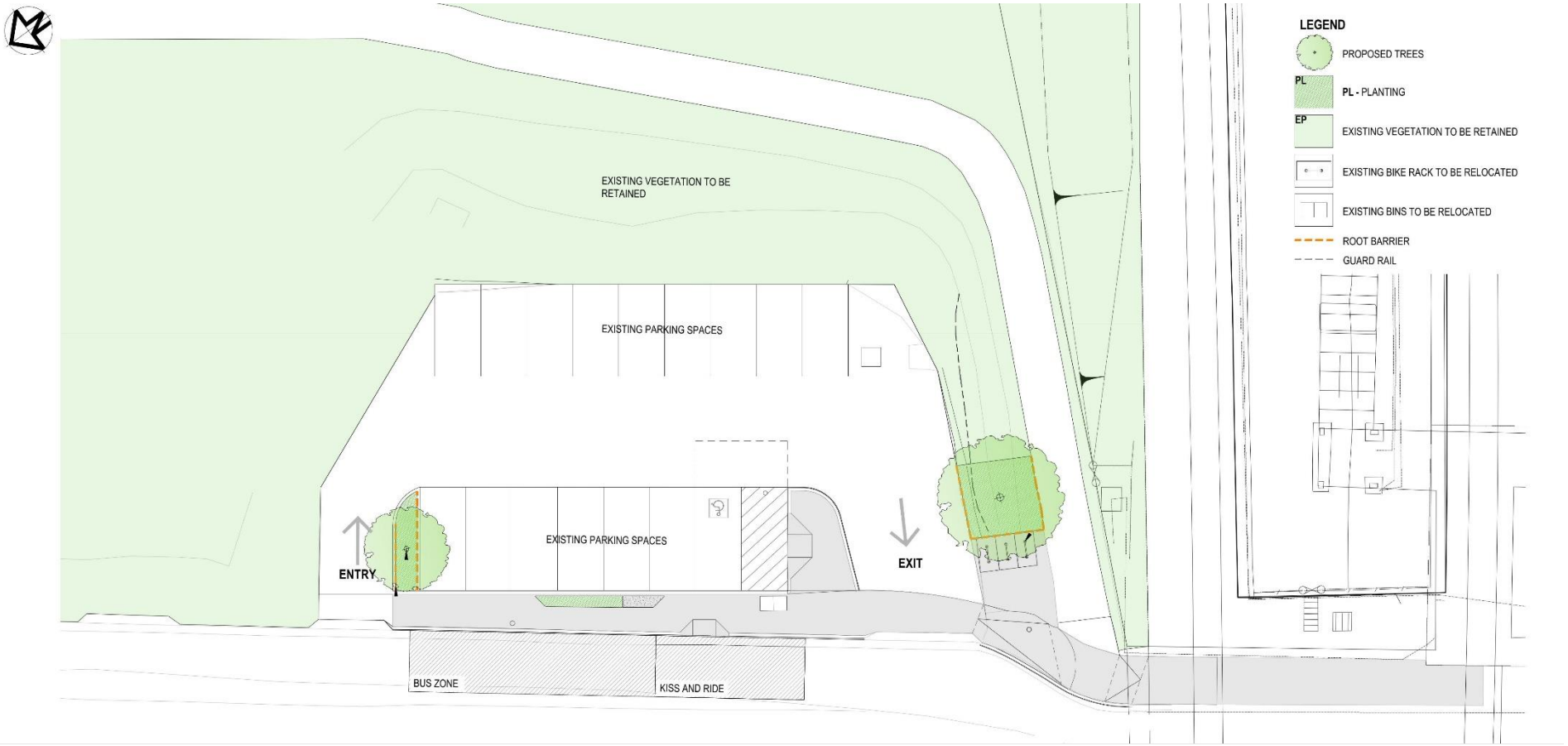
Figure 3-4 Indicative elevation of the Proposal looking south



Source: DesignInc, 2021

(Indicative only, subject to detailed design)

Figure 3-5 Indicative elevation of the Proposal looking east



Source: DesignInc, 2021

(Indicative only, subject to detailed design)

Figure 3-6 Indicative work to the Gordon Crescent commuter car park and pedestrian footpaths as part of the Proposal

3.2 Scope of work

3.2.1 General station and platform upgrades

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

- construction of two new lifts attached to the existing footbridge providing access from the station concourse to Platform 1/2 and Platform 3/4 (refer to artist impression in Figure 3-7)
- construction of new boarding assistance zone canopies on Platform 1/2 and Platform 3/4 (refer to artist impression in Figure 3-8 and Figure 3-9) and installation of seating including space for a wheelchair waiting area beneath the canopies
- installation of a new perforated screening along the footbridge opposite the booking office/concourse building (refer to artist impression in Figure 3-7)
- extension of a small area of the concourse adjacent to Gordon Crescent to extend across the current void space and reinstate it to its original size
- regrade the top landing of each footbridge stair to achieve compliant crossfalls for an accessible path of travel
- upgrade of the existing stairs to include new compliant treads, handrail, new step nosings and replacement of any existing non-compliant tactiles along the existing platforms with new yellow lines and tactiles
- regrading and resurfacing of the platforms to provide compliant accessible paths from the new lifts to the station amenities
- replacement of existing platform drainage grates along the building on Platform 1/2 with heel-proof grates.

3.2.2 Station building modifications

Details of the proposed work to take place to modify the existing station building are provided below:

- internal station building works to the existing building on Platform 1/2 including:
    - upgrade of the existing female toilet to create a family accessible toilet
    - conversion of the existing male toilet into a new unisex ambulant toilet and a store room
    - conversion of the existing northern window and wall in the waiting room building into an entranceway to allow for a new level access to the waiting room and family accessible toilet
    - other minor building modifications required to accommodate elements such as new electrical equipment or new and upgraded station communications equipment, including trenching of new conduits between the platform building and the location of the equipment asset
    - upgrade of door hardware with compliant lever action handles to comply with accessibility standards.

- internal station building works to the existing building on Platform 3/4 including:
    - lowering of the existing concrete slab within the waiting room to provide compliant access (existing seating would be reinstated)
- reinstatement of the original art deco style awing facia on the existing booking office/concourse building facing towards Gordon Crescent (refer to artist impression in Figure 3-10).

3.2.3 Parking, kiss and ride bay and pedestrian work

Details of the proposed work to the existing Gordon Crescent commuter car park are provided below:

- conversion of two existing parking spaces to provide one DDA compliant accessible parking space
- construction of a new compliant accessible path between the existing Gordon Crescent commuter car park and the footbridge, including regrading a section of the footpath along Gordon Crescent
- creation of a kiss and ride bay with a new kerb ramp to Gordon Crescent which may be shared with the school service bus stop
- construction of a bench seat and landscaping next to the kiss and ride bay
- relocation of the existing bike hoops.

3.2.4 Ancillary work

The following ancillary work would also be undertaken as part of the upgrade:

- relocation and/or adjustments of existing services impacted by the proposed lift (where identified), including communications and low voltage cables within the existing platforms
- new high voltage and low voltage electrical supply to support the installation of the new lifts, and earthing and bonding for new metallic components, including installation of a new electrical transformer kiosk on the northern side of the railway line north of Platform 1/2 (adjacent to the existing bin area)
- installation or replacement of station communications systems, CCTV and lighting as required
- relocation or replacement of existing customer facilities including installation of a new Opal card reader, relocation of the vending machine and adjustment of the existing drinking fountain (including installation of a new accessible drinking fountain on Platform 1/2) and removal of the existing phonebooth at the station entrance
- new/upgraded wayfinding signage and provision of the statutory/regulatory signage
- replacement of customer seating (where required to be temporarily removed as part of the Proposal)
- repainting of existing dark coloured bollards at the station entrance to improve visibility
- provision of signage above at least two seats to nominate these for persons with a disability
- adjustments to boundary fencing and/or landscaping (where required).

Source: DesignInc, 2021

Figure 3-7 Artist impression showing the two proposed lift shafts and perforated screening

Source: DesignInc, 2021

Figure 3-8 Artist impression showing the proposed boarding assistance zone canopy on Platform 1/2

Source: DesignInc, 2021

Figure 3-9 Artist impression showing the proposed boarding assistance zone canopy on Platform 3/4

Source: DesignInc, 2021

Figure 3-10 Artist impression showing the proposed re-instated awning facia

3.2.5 Materials and finishes

Materials and finishes for the Proposal have been selected to accord with heritage requirements, to minimise visual impacts, urban design outcomes and to satisfy durability/maintenance requirements and cost effectiveness. Life cycle impacts have also been 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 efficiently. Materials would also be selected based on their suitability for meeting design requirements. Materials selection would also consider sustainability aspects, including consideration of supply chain and sourcing materials locally where possible, prioritising the use of reused and recycled materials where practicable, and investigating use of materials that have environmental labels.

Each of the upgraded or new facilities would be constructed from a range of different materials, with a different palette for each architectural element.

Based on the current design, the Proposal would include the following materials and finishes for the key elements:

- lift – solid brick base to lift shaft with painted steel and glass infill panels
- lift car – stainless steel and glass doors
- lift landing – flooring to match the adjacent pedestrian bridge
- new concourse building awning – steel facia painted grey with a painted aluminium soffit ceiling
- new canopies – painted steel frames and metal cladding (coloured to match concourse building ceiling)
- upgraded stairs – replace non-compliant handrails, nosing and tactiles on existing stairs with new finishes as required
- regraded platform surface – surface finish to achieve compliance
- platform – asphalt
- footpath – concrete.

Subsequent design iterations would be submitted to Transport for NSW Urban Design Review Panel for endorsements at various stages for comment, before being accepted by Transport for NSW. An Urban Design Plan (UDP) would also be prepared by the Construction Contractor, prior to finalisation of detailed design for endorsement by Transport for NSW.

3.3 Design development

3.3.1 Engineering constraints

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

Existing structures: the placement and integrity of existing structures needed to be considered during the development of the design – these structures included the platforms, station buildings, stairs and existing heritage significant elements of the station.

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: Denistone Rail Station Group, including station buildings, platforms and footbridge, are is listed on the TAHE Section 170 Heritage and Conservation Register as a local heritage item. In addition the station is also currently recommended for nomination to the State Heritage Register (SHR) (17/2/2017). Efforts to minimise potential heritage impacts have been considered during the design development for the Proposal. Refer to 6.5 for further details.

Vegetation: Denistone Station is located within an urban environment with streetscapes adjacent to the Station characterised by a diversity of native and exotic plant species and is located adjacent to Symons Reserve which may contain remnants of a Blue Gum High Forest or a Turpentine Ironbark Forest community (both listed as critically endangered ecological communities under the EPBC Act). More information on how biodiversity has been considered as part of the design development is included in Section 6.7.

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

- electrical services (aboveground)
- telecommunication services (underground)
- stormwater and water
- rail utilities, including signalling cabling and overhead wiring
- gas services.

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

Public access: maintaining pedestrian access to the station during normal hours of operation.

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

3.3.2 Design standards

The Proposal would be designed having regard to the following:

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

3.3.3 Sustainability in design

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

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

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

The Sustainability Strategy sets targets across the following key issues:

- climate change adaptation and resilience
- renewable energy
- waste
- materials
- supply chain management
- community connection
- social procurement and workforce.

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

3.4 Construction activities

3.4.1 Work methodology

Subject to approval, construction is expected to commence in early 2022 and take up to 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 and is based on the current concept design and may change once the detailed design methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work.

Table 3-1 Indicative construction staging for key activities

Stage	Activities	Timing
Site establishment and enabling work	• establish site compounds (i.e. fencing, tree protection zones, site offices, amenities and plant/material storage areas) • establish temporary facilities as required (e.g. temporary toilets, temporary construction lights etc.) • erect site hoarding • service location and relocation as required.	Typically standard hours with some potential out-of-hours/ rail shutdown periods work

Stage	Activities	Timing
Lift installation	• excavation of lift pits (including temporary shoring if required) • piling/excavation work for lifts • waterproof, install reinforcement, formwork and concrete to form the lift pits • erect lift structures • install and commission lifts, including fit-out • construct lift landings adjoining the existing footbridge.	Standard hours or rail shutdown periods
Gordon Crescent car park and entry	• line marking and surface finishing/regrading for DDA compliant parking spaces, including construction of retaining structures • reconfigure the existing roadway (kerb ramps, line marking, etc.) to accommodate the proposed kiss and ride bay • relocation of existing bike hoops • install new kerb ramps • install bollards, wheel stops, crash barriers as required to meet safety standards • upgrade of the existing footpath including regrading and widening paths between the station entrance and existing car park	Typically standard hours with some potential out-of-hours/ rail shutdown periods work
Station building work	• reconfigure existing platform bathroom structures to accommodate the revised toilet layout and store rooms • lowering of the Platform 3/4 waiting room floor and installation of new floor finishes.	Typically standard hours with some potential out-of-hours/ rail shutdown periods work
Platform modification work	• regrade platform surface including adjustments to the coping edge, • install new yellow line and tactiles along platforms • install new boarding assistance zone canopies • install new light posts and station services • modify stairs including installation of new nosings, hand railing and tactiles • replace existing drinking fountain • install/relocate new Opal card readers as required • install wayfinding signage • construction of new combined service routes through the platforms to accommodate newly installed infrastructure	Standard hours or rail shutdown periods
Demobilisation	• install other ancillary features and landscaping • remove hoardings • clear site • testing electrical, communications and signalling components.	Typically standard hours with some potential out-of-hours/ rail shutdown periods work

3.4.2 Plant and equipment

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

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

3.4.3 Working hours

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

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

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

Out of hours work is required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to maintain the safety of railway workers and operational assets. It is estimated that a maximum of four rail shutdowns would be required to facilitate the following:

- detailed site survey, services investigations and/or geotechnical investigations within and around the rail corridor
- excavation and installation of lift shafts
- service relocations.

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

3.4.4 Extended Working Hours during COVID-19

The Minister for Planning and Public Spaces has made a number of Orders under Section 10.17 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) in response to the COVID-19 pandemic. This includes the *Environmental Planning and Assessment (COVID-19 Development – Infrastructure Construction Work Days No. 2) Order 2020* (the 'Order'), which commenced on 24 December 2020, and is applicable to construction activities for projects which have been subject to an assessment under Division 5.1, or approval under Division 5.2 of the EP&A Act. The Order extends the standard construction hours to allow infrastructure construction work on Saturday, Sunday and Public holidays (7am to 6pm), without the need for any approval (excluding high noise generating work such as rock breaking or pile driving and the like).

These extended working hours were due to expire on 25 March 2021. However, on Wednesday 24 March 2021, the NSW Government introduced the COVID-*19 Legislation Amendment (Emergency Measures) Bill 2020*, which was subsequently passed by parliament, and came into effect on 25 March 2021. A section of the Bill enabled the extension of the extended working hours until 31 March 2022.

Whilst no further assessment of the environmental impacts are required for these extended working hours, in the event that Transport for NSW would seek to utilise the extended working hours permitted by the Order, advance notification would be provided to the community.

3.4.5 Earthworks

Excavations and earthworks would generally be required for the following:

- the construction of the new lift pit, which would require excavation and piling through the platform into the existing soil/fill at this location
- platform and car park regrading and resurfacing as required
- other civil work including footings and foundations for structures and trenching activities for service adjustments and relocations.

Excavated material would be reused onsite where possible or disposed of in accordance with relevant legislative requirements. Subject to detailed design, it is estimated that around 100 cubic metres of spoil would be excavated to accommodate the lift pits and foundation, and other ancillary work. Specific locations for spoil placement would be agreed with Transport for NSW and the Contractor during the delivery phase.

3.4.6 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 the requirements of the ISC Infrastructure Sustainability Rating Scheme (v1.2). Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable. The principles of circular economy would be integrated into the design and construction processes.

3.4.7 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:

- potential temporary traffic impacts along Gordon Crescent including temporary lane closure during certain construction activities such as lift installation

- temporary changes in parking arrangements to allow for reconfiguration of the Gordon Crescent commuter car park and construction compound area along West Parade during construction
- temporary loss of up to around 10 car parks in the Kinson Crescent car park to accommodate construction compound and laydown area
- temporary increase in walking distance for rail customers on the station platform during construction work due to placement of construction hoarding and work sites
- higher road safety risk levels associated with construction vehicle-pedestrian interactions
- minor disruptions to pedestrian/cyclist movements in and around the station
- a minor increase in traffic on the local road network
- temporary reduction in available parking spaces on the surrounding street network for residents and visitors from construction vehicle parking, including construction worker vehicles.

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.

3.4.8 Ancillary facilities

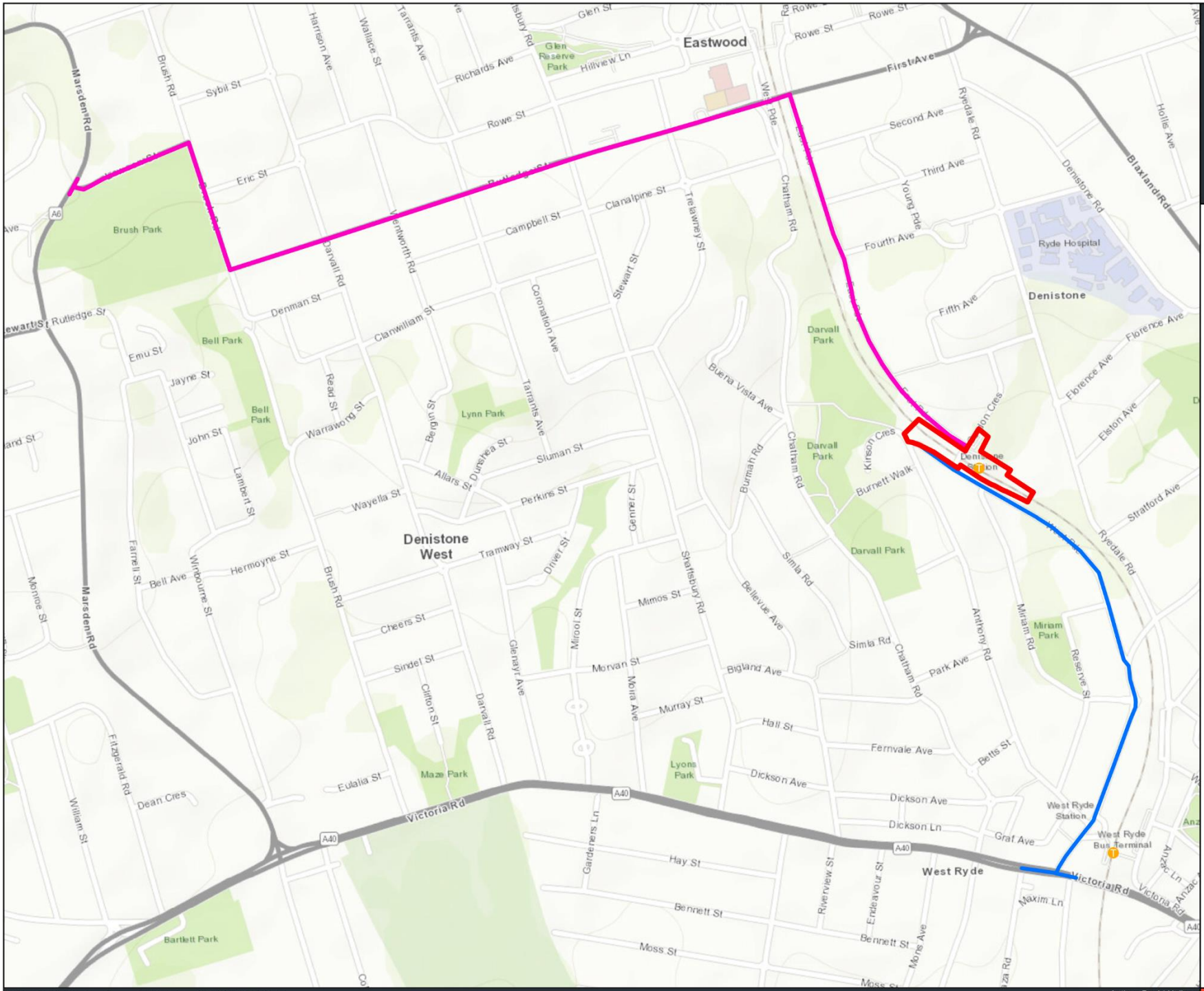
Given the location of the site, the construction haulage routes would need to utilise the existing local road network. The final construction haulage route would be determined by the nominated Construction Contractor during the detailed design of the Proposal, however, indicative proposed construction traffic routes are provided in Figure 3-11. Heavy vehicle access to the construction compound would be via the Victoria Road and the local road network to the site.

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. Three areas have been identified for proposed construction compounds as shown in Figure 3-12. These are:

- the existing cleared areas within the rail corridor and between the tracks to the north of the station platforms below the Gordon Crescent bridge to be used for construction laydown
- an area of existing rail corridor land adjacent to Symons Reserve, to the east of Platform 1/2 to be used for construction laydown and stockpiling
- a portion of the existing Gordon Crescent commuter car park located to the north-west of Kinson Crescent to be used for a site office (Figure 3-13).

Impacts associated with utilising these areas have been considered as part of this environmental impact assessment. The area nominated for the compounds are on land owned by TAHE (rail corridor areas) and City of Ryde Council (car park north-west of Kinson Crescent).

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



Transport Access Program - Denistone Station

Figure 3-10
Traffic Haulage Routes

Legend

- Railway station
- Traffic Haulage Route (North)
- Traffic Haulage Route (South)
- Proposal site

Coordinate system: GDA2020 MGA Zone 56

Scale ratio correct when printed at A3

1:8,000 Date: 08-Nov-21

Data Sources: Imagery © Metromap 2020

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Transport Access Program - Denistone Station

Figure 3-11
Construction Laydown Areas

Legend

- Railway station
- Roads
- Railway
- Proposal site

Construction Laydown Areas

- Construction laydown
- Construction laydown and stockpiling
- Site office and construction worker parking

0 20 40 m

Coordinate system: GDA2020 MGA Zone 56

Scale ratio correct when printed at A3

1:1,500 Date: 05-Nov-21

Data Sources: Imagery © Metromap 2020

Figure 3-13 Commuter car park north east of Kinson Crescent for proposed site office

3.4.9 Public utility adjustments

The Proposal would be designed to avoid relocation of services where feasible, however further investigation may be required. It is likely some services may require relocation, including existing electrical, water and sewer services where they are located within the vicinity of proposed works for the upgrades to the existing toilet facilities. In addition, the provision of new electrical connections between the new lifts and an existing electrical connection would be required. An additional new electrical transformer is also proposed to be installed on the northern side of the railway line north of Platform 1/2 (adjacent to the existing bin area).

Utility relocations are unlikely to occur outside of the footprint of the Proposal assessed in this REF. In the event that work would be required outside of this footprint, further assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase.

Relocation or other work that may affect services would be undertaken in consultation with the respective utility authorities.

3.5 Property acquisition

Transport for NSW does not propose to acquire any property as part of the Proposal. Any temporary access to Council land during construction would be subject to agreement with the City of Ryde Council.

3.6 Operation and maintenance

Ongoing operation of the existing station would remain generally unchanged with Sydney Trains operating and maintaining the station. However, it is expected that footpaths, existing Council car park along Kinson Crescent and adjacent garden/landscape areas would continue to be maintained by City of Ryde Council.

Structures constructed under this Proposal would be maintained by Sydney Trains.

4 Statutory considerations

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

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

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

4.2 NSW legislation and regulations

4.2.1 Transport Administration Act 1988

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

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

2A Objects of Act

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

b) to promote the integration of the transport system,

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

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

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

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

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

…

(a) ***Environmental sustainability***

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

(b) ***Social benefits***

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

4.2.2 Environmental Planning and Assessment Act 1979

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

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

Clause 228 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has or is likely to have a significant impact on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with clause 228 and Appendix B specifically responds to the factors for consideration under clause 228.

4.2.3 Other NSW legislation and regulations

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

Table 4-2 Other legislation applicable to the Proposal

Applicable legislation	Considerations
Biodiversity Conservation Act 2016 (BC Act) (NSW)	The majority of the Proposal site consists of existing hardstand or previously developed land. Although the site is adjacent to an area with the potential for occurrences of threatened species and endangered ecological communities (bushland to the north of the station), the Proposal is unlikely to have a significant impact on any threatened species or community (refer Section 6.7).

Applicable legislation	Considerations
Biosecurity Act 2015 (NSW)	Clause 22 requires any person who deals with a biosecurity matter has a duty to ensure that in so far as is reasonably practicable, the potential biosecurity risk is prevented, eliminated or minimised. Appropriate management methods would be implemented during construction if declared noxious weeds are identified (refer to Section 6.7).
Contaminated Land Management Act 1997 (CLM Act) (NSW)	Section 60 of the CLM Act imposes a duty on landowners to notify the Department of Planning, Industry and Environment (DPIE), and potentially investigate and remediate land if contamination is above EPA guideline levels. The site has not been declared under the CLM Act as being significantly contaminated (refer Section 6.8).
Crown Lands Act 1987 (NSW)	The Proposal does not involve work on any Crown land.
Disability Discrimination Act 1992 (DDA Act) (Cwlth)	The Proposal would be designed having regard to the requirements of this Act. The key objective of the Proposal is to improve the accessibility of Denistone Station which is consistent with the objectives of this Act.
Heritage Act 1977 (Heritage Act) (NSW)	One listed heritage item is located within the Proposal site, the Denistone Railway Station Group. This heritage item is listed on the RailCorp Section 170 Heritage and Conservation Register (item 4801907). It is also currently recommended for nomination to the State Heritage Register (SHR) (17/02/2017) A number of additional heritage items have been identified on the *Ryde Local Environmental Plan 2014* (Ryde LEP 2014) within the vicinity of the Proposal including individual sites and heritage conservation areas (refer to Table 6-11). A heritage impact assessment has been undertaken for the Proposal and is summarised in Section 6.5. The archaeological assessment concluded that there is a low risk of exposing historical archaeological relics during construction and that no archaeological approvals under Section 139 would be required. However, if unexpected archaeological items are discovered during the construction of the Proposal, all work would cease and appropriate advice sought, in accordance with the Transport for NSW *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019d). Formal notification is to be provided by the asset owner to the Heritage Council regarding the demolition of structures associated with the Denistone Railway Station Group at least 14 days prior to the demolition of these structures in accordance with Section 170A(1)(c) of the Heritage Act. No items of state heritage significance were identified near the Proposal, and therefore an approval under Section 60 of the Heritage Act would not be required.
National Parks and Wildlife Act 1974 (NPW Act) (NSW)	Sections 86, 87 and 90 of the NPW Act require consent from DPIE for the destruction or damage of Aboriginal objects. The Proposal is unlikely to disturb any Aboriginal objects (refer Section 6.4). However, if unexpected archaeological items or items of Aboriginal heritage significance are discovered during the construction of the Proposal, all work would cease and appropriate advice sought. Additionally, as identified in Table 5-1 below, the Proposal would not involve impacts to land reserved, or adjacent to, land reserved under the NPW Act.

Applicable legislation	Considerations
Protection of the Environment Operations Act 1997 (PoEO Act) (NSW)	The Proposal does not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, Transport for NSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the Construction Environmental Management Plan (CEMP) to be prepared and implemented by the Contractor.
Roads Act 1993 (Roads Act) (NSW)	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for work on unclassified roads. The roads surrounding the Proposal site are local roads, managed and maintained by the City of Ryde Council (refer to Section 6.1). The Proposal may involve work to the kerb areas of Gordon Crescent which is not classified roads. No approvals under the Roads Act are therefore expected to be required based on the current design of the Proposal. The work would be undertaken in consultation with the City of Ryde including obtaining Road Occupancy Licence(s) for temporary road closures to facilitate work (where required), such as installation of the lift shafts.
Sydney Water Act 1994 (NSW)	The Proposal would not involve discharge of wastewater to a sewer.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW)	Transport for NSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared.
Water Management Act 2000 (NSW)	The Proposal would not involve any water use (from a natural source e.g. aquifer, river – only from the network), water management work, drainage or flood work, controlled activities or aquifer interference.

4.2.4 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

The Infrastructure SEPP is the key environmental planning instrument which determines the permissibility of a Proposal and under which part of the EP&A Act an activity or development may be assessed. Division 15, Clause 79 of the Infrastructure SEPP allows for certain types of development to be carried out by or on behalf of a public authority without consent on any land (i.e. assessable under Division 5.1 of the EP&A Act). Specifically, Clause 79(1) of the Infrastructure SEPP states that:

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

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

> *(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

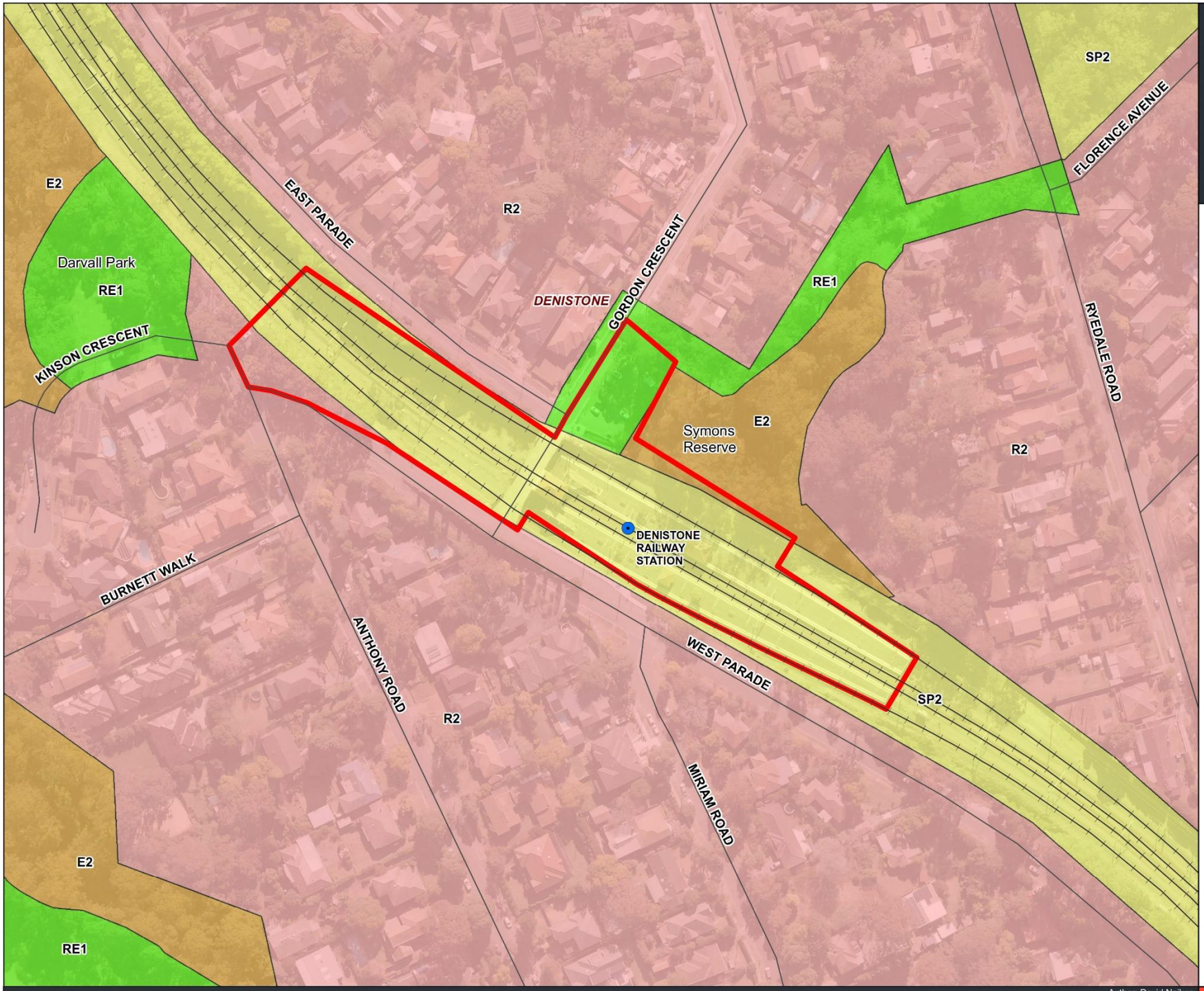
State Environmental Planning Policy No.55 — Remediation of Land (SEPP 55) provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. While consent for the Proposal is not required, the provisions of 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 therefore, would unlikely 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 Ryde Local Environmental Plan 2014

The Proposal is located within the City of Ryde 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.* During the preparation of this REF, the provisions of *Ryde Local Environmental Plan 2014* (Ryde LEP 2014) were considered (refer Table 4-3).

Figure 4-1 shows the relevant section of the zoning map from the Ryde LEP 2014, with the indicative location of the Proposal.



Transport Access Program - Denistone Station

Figure 4-1
Local Environmental Plan
Zoning Map

Legend

- Railway station
- Roads
- Railway
- Proposal site

Land Zoning

- E2 Environmental Conservation
- R2 Low Density Residential
- RE1 Public Recreation
- SP2 Infrastructure

0 20 40 m

Coordinate system: GDA2020 MGA Zone 56

Scale ratio correct when printed at A3

1:1,500 Date: 05-Nov-21

Data Sources: Imagery © Metromap 2020

Table 4-3 Relevant provisions of the Ryde LEP 2014

Provision description	Relevance to the Proposal
Clause 2.3 – Zone objectives and Land Use Table	**Applicable land zones** Under the Ryde LEP 2014, the Proposal is located in areas zoned as: • SP2 Infrastructure (Railways) for the proposed work associated with the station • R2 Low Density Residential for the proposed construction compound location on Kinson Crescent • RE1 Public Recreation for the proposed work to the Gordon Crescent commuter car park on Gordon Crescent. **Zone objectives** The objectives of the applicable land zones are summarised as follows: • SP2 Infrastructure (Railways) – 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 • R2 Low Density Residential – to provide for the housing needs of the community within a low density residential environment, to enable other land uses that provide facilities or services to meet the day to day needs of residents • RE1 Public Recreation – 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. **Permissible development within land zones** Development for the purposes of a rail infrastructure facility is permissible with consent under the provisions of the SP2 Infrastructure (Railways) zone, and road development is permissible with consent under the R2 Low Density Residential and RE1 Public Recreation zones. Notwithstanding the objectives and permissibility of the proposed works within each of the identified zones, the provisions of the Infrastructure SEPP prevail over the Ryde LEP 2014. Development consent from Ryde Council is not required.
Clause 5.10 – Heritage Conservation	Clause 5.10 of the Ryde LEP 2014 provides for the protection of items, places and archaeological sites which have been identified in the Ryde LEP 2014 as having heritage significance. A number of heritage items have been identified on the *Ryde Local Environmental Plan 2014* (Ryde LEP 2014) within the vicinity of the Proposal including individual sites and heritage conservation areas (refer to Table 6-11). A heritage impact assessment has been undertaken for the Proposal and is summarised in Section 6.5, however it is not expected that the Proposal would result in any direct impacts to items of heritage identified in the Ryde LEP 2014.
Clause 6.1 – Acid Sulfate Soils	The Proposal site is not on land mapped as containing Acid Sulfate Soils Map.
Clause 6.2 – Earthworks	Clause 6.2 of the Ryde LEP 2014 aims to ensure that earthworks for which development consent is required would not have a detrimental impact on the environment of the surrounding land. By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the Proposal is permissible without development consent. Consideration of the potential impacts and mitigation measures for earthworks for the Proposal is outlined in Section 6.8.

Provision description	Relevance to the Proposal
Clause 6.3 – Flood planning	Clause 6.3 of the Ryde LEP 2014 aims to address flood risk to life and property associated with the use of land and allow development on land that is compatible with the land's flood hazard The Proposal is not located on land that is mapped as having a flood hazard risk.
Clause 6.4 – Stormwater management	Clause 6.4 of the Ryde LEP 2014 aims to avoid or minimise the adverse impact of urban stormwater on the land on which development is to be carried out, adjoining properties, native bushland, waterways and groundwater systems. A discussion of potential impacts to stormwater is provided in Section 6.9.

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 Denistone Station Upgrade. Section 3.3.3 summarises how ESD would be incorporated in the design development of the Proposal. Section 6.12 includes an assessment of the Proposal on climate change and sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5 Community and stakeholder consultation

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

5.1 Stakeholder consultation during concept design

Key stakeholders for Denistone Station, including City of Ryde Council, a range of Transport for NSW divisions and Sydney Trains, were engaged during the initial development of the Proposal to provide insights into the scope of work for the Proposal, and to participate in the development and assessment of the station improvement options. Workshops and meetings undertaken during design development included:

- options assessment workshop with relevant stakeholders including Transport for NSW, Sydney Trains and a heritage conservation architect
- Transport for NSW Design Review Panel presentation
- safety in design meetings
- value management workshop
- security risk workshop, including members from the local Police Station
- meeting with Local Member for Ryde in November 2021
- meeting with City of Ryde Council in November 2021.

5.2 Consultation requirements under the Infrastructure SEPP

Part 2, Division 1 of the Infrastructure SEPP contains provisions for public authorities to consult with local Councils and other public authorities prior to the commencement of certain types of development. Clauses 13, 14, 15 and 16 of the Infrastructure SEPP require that public authorities undertake consultation with Councils and other agencies, when proposing to carry out development without consent. Table 5-1 provides details of consultation requirements under the Infrastructure SEPP for the Proposal.

Table 5-1 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 | Consultation with Councils – development with impacts on Council related infrastructure and services	Consultation is required where the Proposal would result in: • substantial impact on stormwater management services • generating traffic that would place a local road system under strain • involve connection to or impact on a Council owned sewerage system • involve connection to and substantial use of Council owned water supply • significantly disrupt pedestrian or vehicle movement • involve significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes work that would have the potential to: • disrupt pedestrian and vehicle movements • impact on road pavements under Council's care and control • impact on Council-operated footpaths. Consultation with the City of Ryde Council has been undertaken throughout the initial development of the Proposal and would be undertaken throughout the public display, detailed design and construction phases of the Proposal.

Clause	Clause particulars	Relevance to the Proposal
Clause 14 | Consultation with Councils – development with impacts on local heritage	Where railway station work: • substantially impact on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area.	Denistone Railway Station Group is not listed on the Ryde LEP 2014 heritage schedule. A number of heritage items have been identified on the Ryde Local Environmental Plan 2014 (Ryde LEP 2014) within the vicinity of the Proposal including individual sites and heritage conservation areas (refer to Table 6-11). A heritage impact assessment has been undertaken for the Proposal and is summarised in Section 6.5, however it is not expected that the Proposal would result in any direct impacts to items of heritage or the heritage conservation areas identified in the Ryde LEP 2014. Consultation with the City of Ryde Council is therefore not required in regard to this aspect.
Clause 15 | Consultation with Councils – development with impacts on flood liable land	Where railway station work: • impact on land that is susceptible to flooding – reference would be made to *Floodplain Development Manual: the management of flood liable land.*	The Proposal is not located on land that is susceptible to flooding. Accordingly, consultation with Council is not required in regard to this aspect. Refer to Section 6.9.
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	Where railway station work: • impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land	The Proposal is not located within a coastal vulnerability area as per the *Coastal Management Act 2016.* Consultation with the City of Ryde 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 work: • impact on flood liable land -written notice must be given (together with a scope of work) to the State Emergency Services and taken into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given.	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	Clause particulars	Relevance to the Proposal
Clause 16 | Consultation with public authorities other than Councils	For *specified development* which includes consultation with the DPIE for development that is undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974*, and other agencies specified by the Infrastructure SEPP where relevant. Although not a specific Infrastructure SEPP requirement, other agencies Transport for NSW may consult with could include: • Sydney Trains • DPIE.	The Proposal is not located adjacent to land reserved under the *National Parks and Wildlife Act 1974*. Accordingly, consultation with the DPIE on this matter is not required. Consultation with other public authorities as specified in this clause is not required. However, consultation with Sydney Trains would be ongoing through the next stage(s) of the Proposal.

5.3 Consultation strategy

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

The objectives of the consultation strategy are to:

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

5.4 Public display

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

- installation of information signage at the station with QR codes taking customers to the project webpage
- public display of the REF on the project webpage
- advertisement of the REF public display in local newspapers and on the Transport for NSW Facebook page with a link to the Transport for NSW website that includes a summary of the Proposal and information on how to provide feedback

- distribution of a project update at the station to rail customers, and to local community, outlining the Proposal and inviting feedback on the REF
- consultation with the City of Ryde Council, Sydney Trains, and other non-community stakeholders

Community consultation activities for the Proposal would be undertaken during the public display of this REF. The display period of the REF would be advertised in the week that the public display commences. The REF would be displayed for a period of two weeks. Under normal circumstances Transport for NSW would hold community information sessions at the station. Due to COVID-19 social distancing measures, this is not possible.

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

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

- email: projects@transport.nsw.gov.au
- Transport for NSW website: https://www.nsw.gov.au/have-your-say/denistone-station-accessibility-upgrades
- Mail: Associate Director Environmental Impact Assessment – PO Box K659 Haymarket NSW 1240

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

5.5 Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal (the area around Denistone Station) plus a 50 metre radius, on 27 April 2021. No Aboriginal sites were recorded in this area and therefore would not be impacted by the Proposal. The extensive landscape modification that has occurred across the Proposal site suggests that intact evidence of Aboriginal land use is unlikely to occur within the boundaries of the Proposal site. Similarly, the high level of disturbance would suggest that the archaeological potential of the area is low. Therefore, it was not considered necessary to undertake specific Aboriginal consultation.

5.6 Ongoing consultation

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

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.

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

6 Environmental impact assessment

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

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

6.1 Traffic and transport

6.1.1 Existing environment

Station access

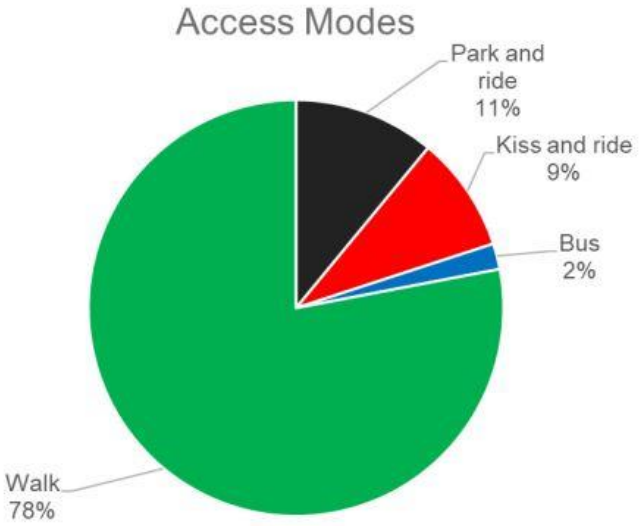
The station platform is currently accessed from Gordon Crescent via an existing pedestrian footbridge and staircase access to each of the station platforms. From Gordon Crescent, there is a 35 metre walk to Platform 1/2 and a 40 metre walk to Platform 3/4. The narrowest point of access is the upper landing of the stairs under the canopy of the existing station concourse building, which has a width of around 2.2 metres.

Accessibility to the station is currently limited for people with mobility issues as the only current means of access to the platforms from the station entrance on Gordon Crescent is via stairs. Station facilities such as toilets and undercover seating are also only available at the platform level.

Station usage

Station barrier counts obtained from the Open Data portal on the Transport for NSW website indicate that in 2018 Denistone Station was one of the lower utilised stations on the Sydney Trains network, with around 670 customers per day on average.

The largest access mode for the station is walking (78 percent) while 11 percent of customers accessed the station by car making use of the nearby commuter carpark facilities. The modes used to access Denistone Station are summarised in Figure 6-1.



Source: Stantec, 2019

Figure 6-1 Access modes to Denistone Station by customers

Surrounding road network

Denistone Station is located between a commuter car park along Gordon Crescent to the north, and West Parade to the south. Gordon Crescent is a local two-way road that runs across the front of the station building while West Parade is a local two-way road that runs parallel to the station platforms to the south. Victoria Road is the nearest State Road that is approved for B-double heavy vehicles.

The surrounding road network is typical of a low-density residential area and comprises local roads (residential streets) managed by City of Ryde Council. Traffic in the area is mainly local traffic and through traffic to Ryde Hospital. There is no formal taxi rank at the station.

Parking

Denistone Station is supported by an existing commuter car park containing around 21 spaces located on Gordon Crescent immediately to the north of the station. This car park has separate entry and exit access available from Gordon Crescent. Additionally, there is a second sealed commuter car park containing around 19 spaces north-west of Kinson Crescent, about 130 metres north-west from the station entrance. No DDA parking provisions are currently allocated within these car parks.

There are informal kiss and ride zones on East Parade and Gordon Crescent to the north of the station, and West Parade to the south of the station. In front of the station building on Gordon Crescent is a signposted no stopping zone on both sides of the road.

There is untimed on street parking available on East Parade and Gordon Crescent to the north of the station, and West Parade to the south of the station which is used by commuters and local residents.

Public transport

Bus

The nearest bus stop is a school service bus stop next to the commuter carpark on Gordon Crescent. The next nearest bus stop which services the train station is located on East Parade, about 900 metres north of Denistone Station. The stop provides services between Eastwood and Ryde, via Blaxland Street (bus route 515).

To the south, the nearest bus stop is located along Victoria Road to the west of West Parade, about 1.1 kilometres from Denistone Station The stop provides services between Parramatta and Central, via Victoria Road (bus route 501).

Rail

Denistone Station is located on the North Shore line (T9 Service) providing services to Hornsby, West Ryde and Strathfield from Central. Trains run from Denistone Station towards the City and Hornsby every 15 minutes in both peak and off-peak periods.

Cycling and pedestrian infrastructure

There are pedestrian footpaths along both sides of Gordon Crescent. Three bike hoops are provided on the northern side of the station adjacent to the existing Gordon Crescent car park. A shared-off road bike path runs from the Symons Reserve, along the Gordon Crescent over bridge and north up through Darvall Park connecting to the Eastwood shopping precinct.

6.1.2 Potential impacts

a) Construction phase

Site compound and haulage routes

As described in Section 3.2, the main site office and construction worker parking would be located within the existing Gordon Crescent commuter car park located to the north-west of Kinson Crescent. Additional construction and laydown areas would be located within the rail corridor to the north of the platforms (typically only during periods of rail shutdowns), and within the cleared areas within the rail corridor to the north of Platform 1/2 (refer to Figure 3-12). The main site office compound would result in the temporary loss of around 10 car parking spaces during the construction period.

Given the location of the site, the construction haulage routes would need to utilise the existing local road network. The final construction haulage route would be determined by the nominated Construction Contractor during the detailed design of the Proposal, however, indicative proposed construction traffic routes have been identified (refer to Figure 3-11). The proposed routes to access the Project site are:

- from Marsden Road along Rutledge Street, onto East Parade, arriving at the Project site from the north
- from Victoria Rd along West Parade, arriving at the Project site from the south

Heavy vehicle access to the construction compound would be via the Victoria Road and the local road network to the site. It is not expected that the proposed construction traffic volumes would result in noticeable impacts on the identified construction traffic routes.

Traffic

The construction traffic generated by the Proposal would be up to 20 to 30 light vehicles and 10 heavy vehicles per day (during peak construction periods with typical volumes expected to be less than this). Most of this construction traffic would be due to construction workers moving to and from site. The heavy vehicles would be required for the delivery and removal of materials, plant, and equipment. Given the low construction vehicle volumes predicted, this additional traffic is unlikely to impact the performance of the surrounding road network and intersections.

Most of the construction work would occur within the Sydney Trains rail corridor boundary. However, the delivery of equipment during construction via Gordon Crescent may result in localised traffic impacts due to the need for temporary traffic management controls such as lane closures or detours. However, any delays on the surrounding road network are expected to be temporary and minor.

Temporary / short term closures of Gordon Crescent for lifting works (such as lift or canopy installation) in weekend track possessions may also be required (subject to preparation of the detailed construction methodology by the Contractor). This may result in the need for temporary contra-flow arrangements during these periods to allow for crane access.

Overall, the construction of the Proposal is anticipated to be manageable with the implementation of mitigation measures (refer to section 6.1.3). Consultation with City of Ryde Council would be undertaken if this is required.

Public transport

Denistone Station would remain operational during the normal day to day construction periods. Train services would be affected during planned rail shutdown periods, although these are not specific to the proposed upgrade and would occur regardless of the Proposal. Buses would replace trains during rail shutdown periods.

No impacts are anticipated to the operation of existing public bus services during construction. Overall, impacts to public transport services during the construction of the Proposal would be limited.

Potential impacts to school bus services associated with the existing bus stop on Gordon Crescent would be managed in consultation with the relevant bus operator(s).

Parking

The proposed construction work, including construction site and access points, would be designed to avoid impacts on parking provisions (where possible). Construction vehicles would be required to park within the main construction compound located to the north-west of Kinson Crescent (where space permits). The loss of around 10 parking spaces would occur at the Kinson Crescent car park. However, any loss in parking would be temporary and would last the duration of the proposed works (around 18 months). The temporary loss of parking during construction is expected to have a minor impact on the overall availability of parking around Denistone Station and is expected to be able to be generally accommodated within the existing on-street parking within the surrounding streets.

Light vehicle parking for construction vehicles outside of the Kinson Crescent site may also impact on the un-timed street parking surrounding the site, however given the limited number of vehicles expected to require this parking, and the temporary duration of the impacts, they are expected to be minor.

Works proposed for the commuter carpark at Gordon Crescent would require temporary periods of closure of the carpark during regrading works. This would see the temporary loss of up to 20 car parking spaces, however the impact is expected to be minor and would be limited to a short period of time where regrading of the carpark is required. It is expected that the loss of these parking spaces would be accommodated for within the existing on-street parking within the surrounding streets during the period of impact. It is the intention of the Proposal that the carpark would remain open for the majority of construction works.

Pedestrians and cyclists

Construction work is expected to have a minor impact on the pedestrian and cycle network given the restricted space in which construction work is to be carried out. It is expected that there may be restrictions and disruptions to pedestrian and bicycle access as a result of the following construction activities:

- upgrading the existing stairs, which would impede customer access to the platforms during construction
- regrading of the station platforms
- upgrade to the existing awning facia along Gordon Crescent
- establishment of the main construction compound in the commuter car park north-west of Kinson Crescent
- temporary loss of access to the existing bike hoops in the Gordon Crescent carpark.

Existing pedestrian access to the station would be maintained throughout construction and diversions would be minimised wherever possible. The presence of construction work on the platform would reduce the overall amount of space available on the platform and temporarily impact pedestrian movements, however given the generally low patronage of the station, this impact is expected to be negligible and can be managed through pedestrian diversions around construction areas. There may potentially be some minor pedestrian impacts along Gordon Crescent during the period of works where activities are undertaken on the entrance forecourt and awning structure due to the need to provide work areas in this location.

Temporary pedestrian diversions or disruptions around the construction work areas has the potential to increase risk to pedestrian safety and would be implemented where necessary to manage commuter and community safety. Construction and temporary diversions would be staged to ensure access to the platforms are maintained at all times outside of rail shutdown periods.

Property access

Access to all adjoining properties would be maintained at all times. Should the detailed design and construction staging of the Proposal identify impacts to residents, affected occupants would be consulted and notified in advance of the scheduled works.

Emergency vehicle access

Access for emergency vehicles would be maintained at the construction site at all times. Emergency services would be advised of all planned changes to traffic arrangements prior to applying the changes. Advice would include information about upcoming traffic disruptions, anticipated delays to traffic, extended working hours and locations of any road possessions.

b) Operational phase

Pedestrians

The Proposal would improve pedestrian movements within and to/from Denistone Station due to the installation of lifts to the platforms, regrading of the platform surface, footpath upgrade and new kerb ramps. This would allow for accessible movement to and from the pedestrian bridge, station platforms, external road network and accessible parking spaces.

Cyclists

The Proposal is not anticipated to result in a direct impact to the nearby cycle network or to cyclists using the station. Bicycle hoops are to be relocated within five metres of the existing bicycle parking hoops and the relocation of these hoops will not generate a noticeable impact to cyclists parking at Denistone Station.

Traffic

The proposed scope of work is not anticipated to result in a direct increase in traffic generation for the local road or pedestrian network during operation. The Proposal would provide an improved access arrangement for local residents who may require lift access to the station. Where this occurs, the proposal may result in assisting to reduce traffic congestion by removing the need for local customers who currently access the train network via West Ryde or Eastwood for lift access (therefore reducing the need to drive to these locations).

Parking

The Proposal would result in minimal changes to the parking supply within the station precinct. The Proposal would result in the permanent loss of two regular parking spaces to accommodate one new accessible car parking space. The new accessible car parking space and kiss and ride bay on Gordon Crescent however are considered to have a positive impact for users of Denistone Station and would ensure both parking and drop off facilities are provided for those with mobility issues.

The location of the kiss and ride bay close to the station along Gordon Crescent is considered suitable and effective to prevent motorists stopping at informal locations to allow passengers to disembark/embark from the vehicles, which can lead to traffic congestion and/or safety issues.

Public transport

The Proposal does not include changes to existing bus/rail services and would not impact on the operation (service operation or timetabling) of public transport in the vicinity of Denistone Station.

The Proposal would include improved facilities and therefore improved access to Denistone Station for those with a range of accessibility issues, which may increase rail patronage. The Proposal is not anticipated to have any impacts on existing bus stops surrounding the station.

Property access

The Proposal would not result in changes to private property access during operation.

6.1.3 Mitigation measures

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

- procedures for preparing and implementing Traffic Control Plans (TCPs) which would provide details for signage and timing of any detours and traffic controls to manage temporary road disruptions such as works to the Gordon Crescent carpark or the delivery of large plant and materials
- identification of final construction traffic access routes, ancillary facilities, contractor parking and loading zones
- nomination of access routes to and from the local road network and contractor parking
- scheduling of work / deliveries to avoid peak times and limiting of work in the road carriageway as much as practicable to limit traffic and parking impacts and maintain customer access to the station
- measures to:
    - limit temporary parking losses
    - maintain pedestrian overpass cross corridor access and customer access to the station through traffic and pedestrian diversions
    - maintain private property access unless otherwise agreed
    - identify changed traffic/pedestrian conditions including details of construction signage including signposts and variable message signs, traffic controllers and other community notifications.
- undertaking consultation with the relevant roads authorities 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.

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

6.2 Urban design, landscape and visual amenity

This section provides a summary of the *Landscape and Visual Impact Assessment* prepared by IRIS Visual Planning + Design (2021).

The assessment included a desktop analysis and site inspection to identify the potential visual impacts of the Proposal on views to the station from surrounding publicly accessible areas. The assessment also includes the preparation of photomontages which provide an indication of what the proposed work may look like within the existing station setting. The detailed methodology used to undertake this assessment is provided in Section 4 of the *Landscape and Visual Impact Assessment*.

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

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

The matrix is used to combine the ratings for sensitivity and magnitude to provide an overall impact rating. Ratings of high and high-moderate are considered to be significant. This matrix is presented in Table 6-1. A qualitative assessment further assigns a rating of 'adverse', 'neutral' or 'positive' to the change in the views seen by receivers.

Table 6-1 Visual impact levels

		SENSITIVITY				
		National sensitivity	State Sensitivity	Regional sensitivity	Local sensitivity	Neighbourhood sensitivity
MAGNITUDE OF CHANGE	Considerable reduction	Very high adverse	Very high adverse	High adverse	Moderate adverse	Minor adverse
	Minor reduction	Very high adverse	High adverse	Moderate adverse	Minor adverse	Negligible
	Neutral	Negligible	Negligible	Negligible	Negligible	Negligible
	Minor improvement	Very high benefit	High benefit	Moderate benefit	Minor benefit	Negligible
	Considerable improvement	Very high benefit	Very high benefit	High benefit	Moderate benefit	Minor benefit

6.2.1 Existing environment

The station is located in a small cutting and consists of two island platforms extending east of the Gordon Crescent road bridge. Each platform contains a small low set brick building with sheltered waiting areas and amenities. There are small shade trees and further seating to either side of the platform buildings. The platforms are accessed via two wide sets of stairs that connect to the road bridge and station concourse building on Gordon Crescent.

The road bridge includes two lanes of traffic (one in each direction) and a narrow footpath on the eastern side (station side) of the bridge. It provides north-south access over the rail corridor for vehicles and pedestrians, between West Parade and Gordon Crescent. The pathway on the eastern side of the bridge also provides access between the station and the existing Gordon Crescent commuter car park. The brick retaining walls along the bridge and

extending along the rail corridor boundary are a local visual feature in views from within the station and surrounding areas.

The station is surrounded by predominantly low-density suburban areas (refer to Figure 6-2). Suburban areas to the north of the station mostly contain single and double storey detached houses, located on wide streets and set of large suburban lots, with established gardens. Streetscapes adjacent to the Station are characterised by a diversity of native and exotic plant species and is located adjacent to Symons Reserve which may contain remnants of a Blue Gum High Forest and Turpentine Ironbark Forest community (both listed as critically endangered ecological communities under the EPBC Act). The southern side of the station is also characterised by the Darvall Estate Heritage Conservation Area which comprises an intact twentieth century residential subdivision, containing dwellings that are typical of late-federation to early-interwar style.

Figure 6-2 Landscape and visual features of the site

Night-time conditions

Areas in the vicinity of the Denistone Station, including the Proposal site, are considered to be of medium district brightness (referred to as a rating of A3 – see section 4.3.4 of the *Landscape and Visual Impact Assessment* (IRIS, 2021)). This is due to the combination of surrounding land uses, which includes relatively high light levels within the station, and moderate light levels along Gordon Crescent, including the commuter car park, and lower light levels in the surrounding residential areas, parks and reserves.

The brightly lit environment of the station is mostly contained by surrounding landform and vegetation. Also, the light emitted from the surrounding streets and residential properties are partly contained by the densely vegetated setting.

Viewpoints

The following viewpoints were selected to represent the range of views to the Proposal:

- Viewpoint 1: View north-west from station platform
- Viewpoint 2: View south-east from East Parade
- Viewpoint 3: View south-west from Symons Reserve
- Viewpoint 4: View north-west from West Parade
- Viewpoint 5: View south-east from West Parade.

The location of each viewpoint is shown on Figure 6-3 and photographs of these viewpoints are provided in Figure 6-4 to Figure 6-8.

Figure 6-3 Viewpoint location plan

Figure 6-4 Viewpoint 1 – View north-west from station platform

Figure 6-5 Viewpoint 2 – View south-east from East Parade

Figure 6-6 Viewpoint 3 – View southwest from Symons Reserve

Figure 6-7 Viewpoint 4 – View north-west from West Parade

Figure 6-8 Viewpoint 5 – View south-east from West Parade

6.2.2 Potential impacts

a) Construction phase

Views during the daytime

During construction there would be a number of elements within the Project site that are consistent with construction activities and typical of construction of this scale. Site sheds, cranes, fencing and movement of construction vehicles associated with the construction activities can be expected on site over the 18-month constriction period until the completion of the Proposal.

Table 6-2 summarises the daytime construction impacts assessed at each of the representative viewpoint locations. The impact rating has been determined using Table 6-1.

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

VIEWPOINT	ASSESSMENT OF VISUAL IMPACT	IMPACT RATING
Viewpoint 1 – View north-west from station platform (refer to Figure 6-4)	A construction site would be established in the middle and fore ground of this view, extending along the western half of each platform. The station would remain open for use, with temporary fencing enclosing areas under construction. There would be works to upgrade the existing stairs, including new balustrades and landings either side of the concourse building. Two new lift structures would be constructed, behind the stairs, located either side of the station concourse building. This construction activity would rise above the stairs and level of the road bridge. The western half of the platforms would be regraded, including the removal and replacement of some areas of asphalt and new tactiles would be installed along the edge of each platform. There would be a new platform canopy constructed on Platform 1/2, between the stairs and platform building. A similar canopy would also be constructed on Platform 3/4 east of the existing overhead gantry (left of view). These works would not impact on the existing platform trees.	Overall, the construction activity, including use of large-scale machinery, would be prominent, extending across much of this view and located in close proximity to customers using the station. This would be a considerable reduction in the amenity of this view, which is of local sensitivity, resulting in a **moderate adverse visual impact**.

VIEWPOINT	ASSESSMENT OF VISUAL IMPACT	IMPACT RATING
	There would be construction activity at the Gordon Crescent commuter car park (right of view) and a laydown area in the existing cleared area adjacent to the reserve, to the north of the station.	
Viewpoint 2 - View south-east from East Parade (refer to Figure 6-5)	A construction site would be established on the eastern side of Gordon Crescent, extending from the commuter car park (left of view) to the station concourse building (right of view). The site would be enclosed by temporary site fencing and there would be construction vehicles accessing the site via the car park entry and travelling across this view. Beyond the car park, there would be glimpses to materials and equipment within a laydown area that would be located in the existing cleared area adjacent to the north of the station adjacent to the reserve. The station concourse building would be modified, with works to install an awning and fascia seen from this location. The brick wall along the road bridge would remain and works to install a lift structure, including the use of cranes, would be seen rising above the brick wall, in front of the concourse building. There would be works to alter the pathway linking the station with the commuter car park, a bus stop and kiss and ride bay in front of the car park. The commuter car park would also be partly regraded and resurfaced and a DDA parking space installed.	Overall, the construction activity, including use of large-scale machinery, would be prominent and would be a considerable reduction of the amenity of this view, which is of local sensitivity, resulting in a **moderate adverse visual impact**.
Viewpoint 3 - View southwest from Symons Reserve (refer to Figure 6-6)	A construction site would be established within the rail corridor, along the island platforms, in the middle ground of this view, and also across the existing car park (right of view). A construction laydown area would be seen along the northern side of the rail corridor, in the vicinity of the existing access gates (left of view). Site fencing and hoarding would be installed along the construction site, partially blocking views to the platform upgrade works. Works to construct the northern lift structure would be seen in the background of view, partly obstructed by the intervening slope, and the view of the existing station concourse building roof. This work would include the use of large-scale machinery and equipment including cranes.	While the construction activity would contrast with this otherwise leafy view, it would be partly obstructed by the intervening vegetation and filtered through trees. Overall, there would be a minor reduction in the amenity of this view, which is of local sensitivity, and this would result in a **minor adverse visual impact**.
Viewpoint 4 - View north-west from West Parade (refer to Figure 6-7)	A construction site would be established in the middle ground of this view, alongside and surrounding the station concourse building and extending east along the station platforms. There would be temporary fencing enclosing the areas under construction. Construction of two new lift structures would be located either side of the station concourse building. This work would include the use of large scale machinery to install the lift structures (noting the large scale equipment would likely be restricted to a short period of time). There would also be works to upgrade the stairs and landings, including replacement of the stair handrails. Throw screens would be installed along the eastern frontage of the existing concourse building.	Overall, there would be a minor reduction in the amenity of this view, which is of local sensitivity, and would result in a **minor adverse visual impact**.

VIEWPOINT	ASSESSMENT OF VISUAL IMPACT	IMPACT RATING
	There would also be construction activity on the platforms including works to regrade the platform and installation of a new canopies on Platform 1/2, between the stairs and platform building and on Platform 3/4 between the platform building and southern end of the platform. While this construction activity would contrast with the heritage character and otherwise leafy view, it would be partly screened by the intervening landform and vegetation.	
Viewpoint 5 - View south-east from West Parade (refer to Figure 6-8)	A construction site would be established in the middle ground of this view, including in areas surrounding the existing station concourse building. Temporary fencing or hoarding would be seen along the eastern edge of the road bridge, extending north of the station and blocking views to the station. There would be construction work at the station concourse building to install an awning and fascia. The works to install two new lift structures, either side of the concourse building, would also be visible, rising above the road bridge. This work would include the use of cranes for part of the time. Construction vehicles may be seen in this view, travelling along West Parade to access a construction laydown area at the commuter car park to the north-west of this location on Anthony Road (behind the viewpoint photo).	The construction activity would be seen prominently on the rise in the centre of this view and would contrast with the otherwise heritage character and leafy view. Overall, there would be a minor reduction in the amenity of this view, which is of local sensitivity, resulting in a **minor adverse visual impact**.

Views at night

The work areas and construction compounds would be lit at night for security. It is unlikely that these areas would be used on an ongoing basis for construction activity during evening hours (other than for specific activities or where works are undertaken during possession periods).

Generally, the character of the construction works at the station concourse, platforms 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 surrounds the station.

There may be some lighting visible from nearby residential properties which overlook the site, such as near the corner of Gordon Crescent and East Parade, near the West Parade and Miriam Road intersection and near the site office compound area.

Overall, the works would result in a minor reduction in the amenity of views at night and would result in a **minor adverse visual** impact during construction.

Urban design and landscape character

During construction, there would be three main compound areas, some of which would be used as temporary laydown areas. One would be located in the rail corridor at the western end of the station platforms (typically only during possession periods), and another located inside the rail corridor, adjacent to Symons Reserve. The third would be located in a portion of an existing Gordon Crescent car park, near the corner of West Parade and Anthony Street. Construction in these areas would reduce public access to these areas during construction. There would be no vegetation removal, and local pedestrian routes in the local area would be maintained.

The existing commuter car park to the north of the station in Gordon Crescent may also be temporarily closed for short periods during upgrade works (or have reduced customer parking spaces), temporarily further reducing the area of car parking available in close proximity to the station. There may also be some minor trimming of trees which overhang the construction site and compounds, which would be undertaken in accordance with Australian Standards if required.

Temporary pedestrian access arrangements and footpath diversions may potentially reduce the legibility and accessibility of the station. There would also be reduced amenity and comfort for pedestrians approaching the station from the north and south, particularly during the civil works and installation of the lifts, due to the use of large-scale machinery.

Overall, there would be a temporary, minor reduction in the landscape and urban design functionality of the station precinct during construction. This precinct is of local sensitivity and there would be a **minor adverse landscape impact**.

b) Operational phase

Views during the daytime

Table 6-3 summarises the daytime operational impacts assessed at each of the representative viewpoint locations. The impact rating has been determined using Table 6-1.

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

Viewpoint	Assessment of visual impact	Impact rating
Viewpoint 1 – View north-west from station platform	Two new lift structures would be visible adjacent to the existing concourse building. These structures would be located behind the existing stairs and rise above the road bridge level. The lifts would remain below the height of the concourse building roofline and not reduce the visual prominence of this existing building. There would be new asphalt across most of the visible platform area and tactiles parallel to the platform edge. The existing stairs would also be upgraded with new balustrades. While the new lift structures would have a contemporary character, with glazing, steel and metal faming, the base of the shafts would be clad with brick, complementing the character of the existing platform buildings. The lift would be located behind the existing stairs and would recede in this view. The lift would also have some transparency with the lift structure glazing and steel mesh throw screens, reducing the visual mass of these structures. The unsympathetic fencing and balustrades on the eastern side of the concourse building, facing the platforms, would be removed and there would be new steel mesh throw screens along the elevated concourse. There would also be new balustrades on the stairs. Together these additions would present a more coherent architectural form and higher quality finish than what currently exists. There would be a new platform canopy structure on platform 3/4 in the foreground of this view, partly enclosing the view with a roof and shading the platform. There would be a second canopy on Platform 1/2, beyond the platform building. This structure would add visual clutter to the station platform, in the middle ground of this view.	Overall, the scale of the proposed built form would not contrast with the existing structures and there would be improvements to the platforms. This would result in a neutral change to the amenity of this view, which is of local sensitivity, and would result in a **negligible visual impact**.

Viewpoint	Assessment of visual impact	Impact rating
	Minor adjustments to the Platform 1/2 building, including removal of the existing air lock walls on the south-eastern side, would open up the view to the south-eastern façade of the heritage platform building, improving this area of the view. The character of the platforms would be refreshed by new pavements, furniture, lighting and signage.	
Viewpoint 2 - View south-east from East Parade	The original art deco style awning and fascia of the station concourse building would be reinstated, improving the original heritage character of the station entry in this view. There would be two rectangular shaped lift structures which would rise above street level, either side of the station entry, rising above the brick walls along the road bridge, which would be retained. These lifts would remain below the height of the existing concourse building roofline but obstructing the view to part of the existing roof of the heritage character station concourse building. The upper portion of the lift would have glazing around the lift lobby, visually lightening the structure. The Gordon Crescent commuter car park would be partly resurfaced and existing trees surrounding the car park in Symons Reserve would be retained. New areas of landscaping along Gordon Crescent would refresh and improve the visual appearance of the street. Figure 6-9 and Figure 6-10 provide a comparison between the existing view and the proposed view (photomontage) for this viewpoint.	While the lifts would add further built form to this view and partly obstruct the view to the station concourse building, the Proposal would improve the prominence of the station entry, with the reinstated awning and facia and improvements to the streetscape. Overall, these factors would balance and there would be a neutral change in the amenity of this view, which is of local visual sensitivity, and a **negligible visual impact**.
Viewpoint 3 - View southwest from Symons Reserve	A new lift structure would be visible in front of the station concourse building. The lift would be seen rising above the intervening landform but remaining below the height of the existing tiled rooftop of the concourse building. The new lifts would be contemporary in character, including glazing and metal sheet roofing, contrasting somewhat with the heritage character building. The presence of the new lift would increase the visual prominence of the station entrance somewhat. There would be a new station platform canopy visible in the background of view, along Platform 1/2, to the west of the platform building. This canopy would be a simple structure and also remain below the height of the platform building.	Overall, there would be a neutral change in the amenity of this view, which is of local visual sensitivity, and would result in a **negligible visual impact**.
Viewpoint 4 - View north-west from West Parade	There would be two new lift structures located either side of the existing concourse building. These would remain below the height of the hipped roof of the concourse building but may rise above the backdrop of vegetation. These new lift structures would have a contemporary character, being a steel frame with glazing, louvres and metal roofing. These materials would create visual lightness and transparency to the upper portion of these structures, reducing their prominence. The lower section of these lifts would be brick, however mostly out of view from this location. This treatment would be in keeping with the character of the heritage buildings and visually unobtrusive as they would be located behind the existing stairs.	On balance, there would be a neutral change to the amenity of this view, which is of local sensitivity and a **negligible visual impact** during operation.

Viewpoint	Assessment of visual impact	Impact rating
	There would be new steel mesh throw screens along the elevated concourse screening the southern façade of this building. Minor additions to the platform a would be seen, including new canopies on Platform 1/2 and 3/4, which would not be prominent at this distance and mostly absorbed into the setting of the station. The changes to the elevated concourse building would alter the character of the station, somewhat, increasing the amount of built form which is visible. The heritage listed station concourse building, including its red hipped roof, would remain visible, flanked by the new lift structures. The Proposal would replace unsympathetic elements, such as the white fencing, and also introduce further contemporary elements which would increase the built structures seen in close proximity to the heritage buildings. Notwithstanding this, the scale of the station would continue to be consistent with the prevailing scale and character of the of the built form in the locality. Figure 6-11 and Figure 6-12 provide a comparison between the existing view and the proposed view (photomontage) for this viewpoint.	
Viewpoint 5 - View south-east from West Parade	In this view, the upgraded station entrance would be partly visible in the middle ground of the view, centred on the road bridge. The original art deco style awning and fascia of the station concourse building would be reinstated, improving the character and increasing the prominence of the station entrance slightly. The brick walls along either side of the Gordon Crescent road bridge would be retained and would block a substantial portion of the view of the station. There would be two new lift structures, one either side of the concourse building, visible rising above the walls. These structures would remain below the level of the concourse building roofline and the lift lobby would be glazed, creating a somewhat visually light structure. Figure 6-13 and Figure 6-14 provide a comparison between the existing view and the proposed view (photomontage) for this viewpoint.	Overall, the lifts would neatly fit within the station entry, framing the existing concourse building and having a bulk and scale that would be absorbed into this view without detracting from the prevailing low density, heritage character of the locality.This would result in a neutral change to the amenity of this view, which is of local sensitivity, and would result in a **negligible visual impact** during operation.

Figure 6-9 Viewpoint 2 – Existing view south-east from East Parade

Figure 6-10 Viewpoint 2 – Proposed view south-east from East Parade (photomontage)

Figure 6-11 Viewpoint 4 – Existing view north-west from West Parade

Figure 6-12 Viewpoint 4 – Proposed view north-west from West Parade (photomontage)

Figure 6-13 Viewpoint 5 – Existing view south-east from West Parade

Figure 6-14 Viewpoint 5 – Proposed view south-east from West Parade (photomontage)

Views at night

During operation, the station would continue to be brightly lit for security and safe use at night (as is currently experienced). The upgraded station concourse, including two new lift structures, would be seen in the context of the existing station and streetlights along Gordon Crescent. This area of the station may be more prominent in views from residences directly overlooking the station, where the new lifts and upgraded station concourse would be seen. However, the lifts would be lower than the existing station concourse building and would not introduce lighting to a higher level than the existing station concourse.

There would be additional lighting provided for the kiss and ride bay and DDA compliant parking space on Gordon Crescent. This additional lighting would be seen in the context of the existing commuter car park and would be set back from residential properties.

Overall, the upgraded 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 (trespass) onto private properties to the north and south of the station, as the neighbouring residential properties are separated from the station by existing vegetation, which would be retained.

The final design of lighting for the station would ensure that it is consistent with the requirements of the Australian Standards for the control of obtrusive lighting effects. Generally, the character of the proposed station upgrade at night would be absorbed into the surrounding brightly lit environment.

Overall, this would result in no perceived change in the amenity of views at night, resulting in a **negligible visual impact** at night during operation.

Urban design and landscape character

During operation, there would be substantial improvements to accessibility of the station precinct with the introduction of lifts at the station, upgrades to the footpaths and station entrances, upgrade of the commuter car park including provision of an accessible car parking space, kiss and ride bay and bus stop, and improvements to the platform surface and facilities within the platform buildings.

The Proposal would improve legibility within the station precinct through the increased visual prominence of the station entry on Gordon Crescent. This station entry would include a widened entrance and there would be public realm enhancements with new paving, furniture and signage, would also improve the appearance and accessibility of the station. The existing mature trees around the station would be maintained, including the trees within Symons Reserve, which frame views to the station.

There would be a new covered waiting area along each platform, providing sun and rain protection for customers at the station. The ornamental gardens along the platforms would also be retained, maintaining the level of shade and leafy character of the station.

The landscape character of the locality would be maintained with the Proposal not detracting from the prevailing low-rise heritage built form character and leafy setting of the locality.

Overall, there would be a noticeable improvement to the urban design functionality and landscape character of the station precinct. The station is of local sensitivity and this would result in a **minor beneficial landscape impact** during operation.

6.2.3 Mitigation measures

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

The detailed design of the Proposal would be undertaken with reference to the recommendations included in the *Landscape and Visual Impact Assessment* (IRIS, 2021)). Key project specific mitigation measures would include:

- design detail that is sensitive to the amenity and character of heritage items located within or adjacent to the Proposal
- consideration for integration with the surrounding local and regional open space and or landscape networks including landscaping within the road verge along Gordon Crescent near the existing commuter car park would be considered

- consideration of the surrounding built form (existing or desired future) including building height, scale, bulk, massing and land-use
- consideration of light spill from the construction area into adjacent visually sensitive properties would be minimised by directing construction lighting into the construction areas and ensuring the site is not over-lit. This would include the sensitive placement and specification of lighting to minimise any potential increase in light pollution
- finishes and materials for the station would be complementary to the existing locality and landscape and reflective surfaces would be minimised with a preferred use of muted colours
- disturbance of vegetation would be limited to the minimum amount necessary to construct the proposal.

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

6.3 Noise and vibration

This section provides a summary of the *Noise and Vibration Impact Assessment* prepared by WSP (2021). The methodology used to undertake this assessment is provided in Section 3 and Section 4 of the *Noise and Vibration Impact Assessment*.

6.3.1 Existing environment

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 *Construction Noise and Vibration Strategy* (CNVS) (Transport for NSW, 2019a) have been identified in the surrounding area:

- residential
- passive recreation areas.

Sensitive receivers are outlined in Table 6-4 and shown in Figure 6-15.

Figure 6-15 Sensitive receivers and noise monitoring locations

Table 6-4 Noise Catchment Area (NCA) and classification of representative receivers

NCA	Receiver type	Address	Minimum distance to proposal [1]	Receiver id
1	Passive Recreation	Darvall Park	30m west of site	P1
	Residential	79 Chatham Road	25m west of site	R1
	Residential	82 Anthony Road	28m south of site	R2
	Residential	53 Anthony Road	28m south of site	R3
	Residential	102 W Parade	30m south of site	R4
	Residential	21 Miriam Road	28m south of site	R5
	Passive Recreation	Symone's Reserve	Adjacent to the site (northern boundary)	P2
	Residential	82 E Parade	68m north-west of site	R6
	Residential	92 E Parade	30m north of site	R7
	Residential	102 E Parade	30m north of site	R8
	Residential	24 Gordon Crescent	14m north of site	R9
	Residential	6a Ryedale Road	22m north of site	R10
2	Residential	4 Ryedale Road	86m east of site	R11

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

Background noise levels

The prevailing background and ambient noise levels surrounding the Proposal were determined through a combination of unattended and operator attended noise surveys in accordance with the *Australian Standard 1055-1997- Acoustics-Description and Measurement of Environmental Noise* (AS 1055) and the NPfI.

The aim of the monitoring is to provide a representative characterisation of the long-term noise environment within the entire noise catchment area, not the noise levels at the worst case sensitive receivers. Therefore, the noise monitoring locations have been selected to avoid being too influenced by rail noise or road traffic noise from local streets. The background characteristics for NM01 and NM02 included:

- at NM01 (representing NCA01), the background levels were characterised by urban noise sources. Ambient noise levels were controlled by car pass-by, birds and trains
- at NM02 (representing NCA02), the background levels were characterised by urban noise sources. Ambient noise levels were controlled by car and truck pass-by, birds, dog barking and trains.

The results of the unattended and attended noise surveys and observations are detailed in Table 6.4 and Table 6.5.

Table 6-5 Summary of unattended noise monitoring results

Location	Rating Background Level (RBL) dBA[1]		Ambient Noise Levels L_{eq} dBA[2]			
	Day[3]	Eve[3]	Day[3]	Eve[3]	Day[3]	Eve[3]
NM01	37	36	30	57	53	53
NM02	40	39	34	57	54	53

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

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

(3) Time periods defined as – Day: 7.00 am to 6.00 pm Monday to Saturday, 8am to 6pm Sunday; Evening: 6.00 pm to 10.00 pm; Night: 10.00 pm to 7.00 am Monday to Saturday, 10.00 pm to 8.00 am Sunday.

Table 6-6 Summary of attended noise measurement results

Location	Time	dBA $L_{eq(15min)}$	dBA $L_{90(15\ minute)}$	Observations
NM01	2:10pm – 2:25pm	50	37	**Ambient:** Car pass-bys up to 60 dBA, birds chirping up to 50dBA, train 59dBA. **Background:** Urban hum
NM02	1:06pm – 1:21pm	50	40	**Ambient:** Car passbys up to 60 dBA, birds chirping up to 50dBA, dog barking 40 to 45 dBA, train 58 dBA, truck passby 46 dBA. **Background:** Urban hum

The results of the attended noise survey are consistent with the results of the unattended noise monitoring with RBLs during the daytime period of 37 dBA and 40 dBA at NM01 and NM02 consistent with the results of the unattended monitoring program.

6.3.2 Potential impacts

a) Construction phase

Predicted noise levels

Table 6-8 presents the predicted noise levels for the representative receivers for the key construction work activities excluding demobilisation (refer to Section 3.2.1). Description of the key construction scenarios are provided in Table 6-7. Maps of the predicted noise levels are provided in Appendix B of the *Environmental Noise and Vibration Assessment* (WSP, 2021).

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, it follows that the more stringent management levels are also exceeded.

Table 6-9 presents the results of the predicted sleep disturbance assessment.

Table 6-7 Modelling scenarios

Scenario ID	Stage	Activities	Timing	Indicative Duration (total)
S01	Site establishment, enabling works, site compounds	• establish site compounds (i.e. fencing, tree protection zones, site offices, amenities and plant/material storage areas) • establish temporary facilities as required (e.g. temporary toilets, temporary construction lights etc.) • erect site hoarding • service location and relocation as required.	Typically standard hours with some potential out-of-hours/ rail shut down periods work	2 Months
S02	Lift Works	• excavation of lift pits (including temporary shoring if required) • piling/excavation work for lifts • waterproof, install reinforcement, formwork and concrete to form the lift pits • erect lift structures • install and commission lifts, including fit-out • construct lift landings adjoining the existing footbridge.	Standard hours or rail shut down periods	9 Months
S03	Gordon Crescent car park and entry	• line marking and surface finishing/regrading for DDA compliant parking spaces, including construction of retaining structures • reconfigure the existing roadway (kerb ramps, line marking, etc.) to accommodate the proposed kiss and ride bay	Typically standard hours with some potential out-of-hours/ rail shut down periods work	6 months
		• relocation of existing bike hoops • install new kerb ramps • install bollards, wheel stops, crash barriers as required to meet safety standards • upgrade of the existing footpath including regrading and widening paths between the station entrance and existing car park		

Scenario ID	Stage	Activities	Timing	Indicative Duration (total)
S04	Station building works	• reconfigure existing platform bathroom structures to accommodate the revised toilet layout and store rooms • lowering of the Platform 3/4 waiting room floor and installation of new floor finishes.	Typically standard hours with some potential out-of-hours/ rail shut down periods work	9 Months
S05	Platform modification work	• regrade platform surface including adjustments to the coping edge, • install new yellow line and tactiles along platforms • install new boarding assistance zone canopies • install new light posts and station services • modify stairs including installation of new nosings, hand railing and tactiles • replace existing drinking fountain • install/relocate new Opal card readers as required • install wayfinding signage • construction of new combined service routes through the platforms to accommodate newly installed infrastructure	Standard hours or rail shut down periods	2 Months
S06	Demobilisation	• install other ancillary features and landscaping • remove hoardings • clear site • testing electrical, communications and signalling components.	Typically standard hours with some potential out-of-hours/ rail shut down periods work	2 months

Table 6-8 Predicted construction noise levels

NCA	Receiver ID	Receiver type	Noise management level, dBA $L_{eq(15min)}$[1,2,3]				Modelled Maximum Noise level per scenario at closest point to receiver, dBA $L_{eq(15min)}$[2,4,5]					
			Standard Hours	OOHW 1	OOHW 2	HNA	S01	S02	S03	S04	S05	S06
1	R1	Residential	47	42	35	75	56	54 (61)	51 (59)	54 (60)	48 (59)	57
1	R2	Residential	47	42	35	75	80	66 (73)	63 (71)	66 (72)	60 (71)	81
1	R3	Residential	47	42	35	75	73	72 (79)	67 (75)	70 (76)	64 (75)	74
1	R4	Residential	47	42	35	75	79	76 (83)	79 (87)	82 (88)	76 (87)	80
1	R5	Residential	47	42	35	75	80	67 (74)	81 (89)	84 (90)	78 (89)	81
2	R6	Residential	50	45	39	75	69	61 (68)	58 (66)	61 (67)	55 (66)	70
2	R7	Residential	50	45	39	75	78	70 (77)	67 (75)	70 (76)	64 (75)	79
2	R8	Residential	50	45	39	75	83	81 (88)	83 (91)	86 (92)	80 (91)	84
2	R9	Residential	50	45	39	75	88	72 (79)	85 (93)	88 (94)	82 93)	89
2	R10	Residential	50	45	39	75	81	67 (74)	83 (91)	86 (92)	80 (91)	82
2	R11	Residential	50	45	39	75	66	59 (66)	68 (76)	71 (77)	65 (76)	67
1	P1	Passive Recreation	60	n/a	n/a	n/a	63	58 (65)	56 (64)	59 (65)	53 (64)	64
2	P2	Passive Recreation	60	n/a	n/a	n/a	77	67 (74)	73 (81)	76 (82)	70 (81)	78

(1) HNA – Highly noise affected

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

(3) Where a predicted noise level exceeds a less stringent management level (SH), it follows that the more stringent (OOHW) management levels are also exceeded. OOHW activities are SC02 (lift works), SC04 (station building works) and SC05 (platform modification works) only.

(4) Values exclude plant items with special audible characteristics (concrete saw). Values in brackets indicate predicted noise levels where this plant is in use.

The formatting within the construction noise assessment tables indicates the following:

- *the orange shaded cells show exceedances of the standard hours day period NML*
- *the yellow shaded cells show exceedances of the out-of-hours (OOH) day period NML*
- *the green shaded cells show exceedances of the OOH evening period NML*
- *the blue shaded cells show exceedances of the OOH night period NML*
- *the **cells with red text** show exceedances of highly noise affected noise management levels.*

Table 6-9 Predicted sleep disturbance assessment

NCA	Receiver ID	Address	Noise management level (NML), dBA $L_{eq(15min)}$[1,2]		Activity predicted maximum noise level L_{max} dBA			
			RNP screening criterion	RNP Awakening goal	S02	S03	S04	S05
1	R5	21 Miriam Road	45	65	67 (74)	81 (89)	84 (90)	78 (89)
2	R9	24 Gordon Crescent	49	65	72 (79)	85 (> 90)	88 (>90)	82 (>90)

(1) Sleep disturbance criteria applicable to residential receivers only.

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

The formatting within the sleep disturbance maximum noise level table indicates the following:

- *the grey shaded cells show exceedances of the RBL + 15 dBA screening criteria*
- *the blue shaded cells show exceedances of the L_{max} screening criteria.*

Assessment of predicted noise levels

The assessment of construction noise impacts indicates that noise levels are predicted to exceed relevant Noise Management Levels (NMLs) at the nearest sensitive receivers in NCA01 and NCA02 during all activities, with Scenarios S02 (lift works), S03 (car park and entry), S04 (station building works), S05 (platform modification works) presenting the greatest impact to sensitive receivers. 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 concrete saws, which are expected to be used infrequently and over short periods over the construction period. It is highly unlikely that these items of equipment would be fully utilised during works or would be used throughout out of hours periods or night time periods. When these items of equipment are not used, noise levels would be notably lower at the receivers.

Within NCA01, the worst case construction noise levels are predicted to exceed the noise management level by up to 33 dBA to 43 dBA. The closest residences to the construction works are predicted to be highly noise affected throughout the proposed works. Within NCA02, worst case construction noise levels are predicted to exceed the noise management level by up to 38dBA to 44 dBA during each scenario. The closest residences to the construction works are predicted to be highly noise affected throughout the proposed works. Construction noise levels are predicted to exceed relevant NMLs for the passive recreation receivers located near the Proposal.

Out of hours works (OOHW) are proposed during three construction scenarios, including during rail shutdowns. Up to four rail shutdowns are 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 shutdowns, however it is expected that the majority of OOHW would be limited to these four periods, and night works are likely to be limited. The assessment of OOHW 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 out of hours activities.

During OOHW period 1, noise levels are predicted to result in exceedances of the OOHW criteria by up to 48 dBA at receivers in NCA01 (south of the Proposal) and 49 dBA in NCA02 (north of the Proposal). During OOHW period 2, noise levels are predicted to result in exceedances of the OOHW criteria by up to 55 dBA at receivers in NCA01 (south of the Proposal) and 55 dBA in NCA02 (north of the Proposal).

Any night time works are likely to generate sleep disturbance impacts at residential receivers adjacent to the construction footprints (however these are expected to be minimal). Noise management and mitigation measures would be required to manage OOHW.

These impacts would be managed and minimised where possible through construction planning and the implementation of mitigation measures (refer to Section 6.3.3).

Construction traffic noise

The potential for noise impacts to occur due to light and heavy vehicle movements on public roads generated by the construction work has also been assessed in accordance with the *Road Noise Policy* (RNP) (EPA, 2011).

Proposal-related construction traffic noise impacts are expected comply with the road noise criteria during the daytime period, however impacts would be noticeable on local roads during night time periods. It is recommended that heavy vehicle movements to and from the site be restricted to standard (daytime) hours where feasible.

Overall, it is expected that construction traffic due to the Proposal would comply with RNP criteria.

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 jack hammering for the stair upgrade, interchange upgrades and station building work.

The construction footprint is located approximately 30 metres from receivers in NCA01 and 20 metres from receivers in NCA02. Vibratory rolling works may be required during Scenario 3 (car park and entry). In this instance vibratory rolling may occur within the 'human response' minimum working distances for the nearest residential dwellings within NCA02.

Additionally, the station itself is a heritage building and therefore works may occur within the proposed heritage minimum working distances. Where vibration intensive works occur within the proposed minimum working distances management and mitigation measures would be required.

b) Operational phase

For operational noise, the mechanical plant selections are subject to detailed design. It is not expected that the mechanical plant that would be installed would have a significant noise impact. Any mechanical plant, equipment or other operational noise source proposed is to be designed to meet the NPfI noise triggers identified in this report. Operational noise would not be noticeably different to what is currently experienced at the station.

6.3.3 Mitigation measures

Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009), Construction Noise and Vibration Strategy (Transport for NSW, 2019a) and the Environmental Noise and Vibration Assessment for the Proposal (WSP, 2021). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable

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

6.4 Aboriginal heritage

6.4.1 Existing environment

The Aboriginal heritage of the region is thousands of years old, the region inhabited by the Wallumdegal Clan of the Darug nation people.

An assessment was undertaken for the Proposal with consideration of the requirements identified in the *Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (OEH, 2010). As identified in Section 5.5, a search for known Aboriginal heritage items in the vicinity of Denistone Station (plus a 50 metre buffer) was undertaken on 27 April 2021 using the NSW Heritage AHIMS database. The AHIMS search confirmed there to be no known Aboriginal heritage items within or close to Denistone Station.

The extensive landscape modification that has occurred across the Proposal site and surrounding area, with the station being located within an existing cutting, suggests that intact evidence of Aboriginal land use is unlikely to occur. Similarly, the high level of disturbance due to construction of the rail line and platforms would suggest that the archaeological potential of the area is low.

6.4.2 Potential impacts

a) Construction phase

Construction of the Proposal would involve some minor excavation and other ground disturbing works for the following activities:

- the foundation and pit for the new lift shaft would require excavation into existing platforms, rock, soils and fill up to a depth of around three metres
- minor excavation for the construction/re-grading for compliant ramps and pavement works within the station precinct
- minor excavation within the existing platforms to allow for the new electrical connections, typically to a depth of around one to two metres.

Ground disturbing activities have the potential to impact Aboriginal sites if present. However, as no known Aboriginal heritage items are located in the vicinity of the Proposal and no significant excavations are proposed, no impacts on Aboriginal heritage are expected as a result of the Proposal.

b) Operational phase

It is not expected that there would be any risks to Aboriginal heritage from the operation of the Proposal.

6.4.3 Mitigation measures

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

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

6.5 Non-Aboriginal heritage

This section provides a summary of the *Statement of Heritage Impact* (SoHI) prepared by Artefact Heritage (2021). The methodology used to undertake this assessment is provided in Section 1.4 of the *Statement of Heritage Impact*.

6.5.1 Existing environment

The below sections provide an overview of the historical background and listed items of heritage. Further discussion of the historical background of Denistone Station is provided in Chapter 3 of the *Statement of Heritage Impact*.

Historical background

Early settlement and land use in Denistone primarily comprised of large farming estates with large owner-occupied and tenanted homesteads.

The opening of the railway line to Hornsby and the nearby Eastwood (formerly Dundas) Station in 1886 led to the first subdivisions in the area, advertised for a mix of residential and industrial uses.

The land on which Denistone Station is located is within the original land grant given to James Thompson in 1794. Although the railway line ran through Denistone from 1886 as part of the Sydney to Newcastle Link Railway (the 'Short North' line), the Denistone Railway Station was not opened until 26 September 1937.

Denistone Station was constructed in 1937, comprising two side platforms, an overhead booking office, station buildings, retaining walls, a road bridge and a footbridge. The structures were constructed as early examples of the Inter-War Railway Domestic style of railway architecture, introduced by the then Chief Civil Engineer, Albert Fewtrell, who experimented with adapting elements of Functionalist twentieth-century domestic architecture into railway architecture. Although the original drawings demonstrate the plan for Denistone to be a double island platform station, the platforms were originally constructed in 1937 as side platforms with steel rail and concrete facings, with multiple garden beds and trees lining the platforms.

Several alterations were made to the station during the twentieth and twenty-first centuries, including alterations to the road bridge, overhead booking office, the platforms, the platform buildings and the quadruplication of the line. Despite the reconstruction of the road bridge to allow for the new station in 1937, historical aerial photographs indicate that the decking of the road bridge was widened, or partially rebuilt, and extended in c.1945, and again by 1955, to allow for the future quadruplication of the railway. Minor alterations were made to the booking office in 1945, including the alteration of the ticket windows. More major alterations were made in the late twentieth century, purportedly following a fire, which required the replacement of the front awning and the removal of the bookstall, remnants of this bookstall are still visible today.

Historical aerial and terrestrial imagery indicate that in 2018, the roof finish of the overhead booking office appears to have been restored or replaced with a new terracotta Marseille tiled roof.

The platform buildings underwent minor alterations in the second half of the twentieth century, mostly comprising the installation of concrete and tiled floors, new amenities and the infilling of windows. Works for the quadruplication of the line commenced in 1952 and by 1955, historical aerials indicate that the platforms were converted into island platforms. These works completed the original design of Denistone station as a double island platform station.

Ad hoc work to the platforms appears to have continued throughout the second half of the twentieth century, including alteration of the garden beds, benches and lighting, but the general arrangement appears to have been established by 1965. The historical aerials additionally demonstrate that the widening of the railway corridor between 1943 and 1955 in preparation for duplication resulted in the reconstruction of the brick retaining walls at this time. Despite these early works at Denistone Station in preparation for the additional lines, quadruplication of the line was delayed and only occurred with the opening of a third and fourth tracks in 1978 and 1987, respectively. Despite being threatened with closure in 2001, the station has remained in use into the twenty-first century and remains largely unaltered since its establishment in 1937.

Significance of Denistone Station Components

Table 6-10 provides an assessment of the relative contributions of individual components of the station to its heritage value. This assessment was based on the standard grades of significance set out in the NSW Heritage Office publication 'Assessing Heritage Significance'. Further details are available in Section 5 of the *Statement of Heritage Impact*.

Table 6-10 Grades of significance for Denistone Station components

Component	Assessment	Grading
Road bridge	The road bridge represents the rapidly changing needs of NSW railways in the early to mid-twentieth century, as the majority of the fabric dates to between 1937 and 1965. The main components of the road bridge are of moderate significance. The services are of little significance. The signage and painted finishes to the brickwork are intrusive.	Overall: Moderate Brick piers, brick retaining wall, concrete slab, concrete path, steel balustrades, steel supports: Moderate Services: Little Signage, painted finished to brickwork: Intrusive
Overhead Booking Office, Type 19	Externally, the original form and setting have been retained, as well as the general aesthetic of the Functionalist style building with weatherboard walls and asymmetrical hipped Marseille tiled roof, despite the partial replacement of the former over time and the replacement of the latter in 2018. Internally, the original layout has been partially retained through the retention of the 1937 L-shaped timber counter, the original safe and the north-eastern side of an original partition wall at the north-western end of the building. The existing wall finishes date to the second half of the twentieth century. The glazing in one of the louvred clerestory windows along the north-eastern elevation has been retained.	Overall: High Overall Exterior: High Roof tiles, cladding, awning and ceiling: Little Roof form, weatherboarding, steel beams, steel columns and timber posts: High Lighting: Neutral Signage: Intrusive Overall Interior: High Counter, safe and partition wall: High Walls finishes and louvred clerestory glazing: Moderate Doors and ceiling: Little Ticket window framing: Intrusive
Footbridge – including Ticket Office	The original staircases, concrete slabs, newel posts, balustrading, staircase handrail, steel structure and the former bookstall trellis (supports) are of exceptional significance to the station. The bookstall trellis comprises a steel structure, and although the bookstall above itself is no longer extant, the timber footings and bolts have been retained. The concrete treads of the staircases are of moderate significance due to ad hoc modifications and the functional nature of the treads. Later alterations, such as the asphalt layers, signage, Opal card machines, the telephone box, bollards and replica steel balustrading in the former location of the bookstall are of neutral significance. The loop top fencing along the south-eastern side of the footbridge and the tactiles along the top landing of the staircases are intrusive.	General: Exceptional (State) Original elements, (including newel posts, concrete slabs, former bookstall trellis, staircase handrails and balustrades): Exceptional Concrete treads: Moderate Later alterations: Little-Intrusive

Component	Assessment	Grading
Station Building (Conveniences Building), Type 13	The exterior of the Conveniences Building has retained a high amount of integrity, particularly the original brickwork, tiled roof, awning, timber-framing of the windows and the timber storeroom door and its hardware. Later services, gates, window bars and signage are of little to intrusive significance. The original interior layout is largely retained, with all original walls, window frames, bathroom stall doors, partitions and doorways intact. The walls are rendered plaster with the relief moulded dado retained in the waiting room and the women's bathroom, while the ceilings are timber battened fibrous plaster and decorative plaster cornices. The current bathroom amenities, concrete flooring, perforated gates and floor tiles were installed in the late twentieth century. The existing benches in the waiting room are of neutral significance.	Overall: High Original exterior elements: High Later exterior elements: Little-Intrusive Interiors: High Bathrooms: Low-High Waiting room: Moderate-High Storeroom: Moderate
Station Building (Shelter Shed), Type 13	The exterior of the Shelter Shed has retained a high amount of integrity, particularly the original brickwork, tiled roof, awning and timber-framing of the windows. Later services, signage and window infills are of little to intrusive significance. The original interior layout has been retained, with all original walls, doorways and window frames intact despite later infills. The interior walls are rendered plaster, and the relief moulded dado has been retained, while the ceilings are timber battened fibrous plaster with timber quad cornices. The current perforated gate, concrete flooring and floor tiles were installed in the late twentieth century, and as such, are of little significance. The existing benches in the waiting room are of neutral significance.	Overall: High Exterior: High Interiors: Neutral-High
Platforms	The platforms are representative examples of 1930s steel rail and shuttered concrete side platforms converted into island platforms with steel rail and shuttered concrete facing in the 1950s. Their configuration as two island platforms is rare along the network. They demonstrate aesthetic and historical significance at the local level. The garden beds, comprising square concrete edging, planted with native trees and grasses, contribute to the aesthetic significance of the platforms and the station overall, despite the later provenance of the planting. Garden beds were historically common along the line compared to today, and as such, are relatively rare. The garden beds represent continued contribution to the setting of the platforms and station, their fabric is, however, not original and of little significance. The cast iron drains in front of the platform buildings are examples of a short-lived policy for platforms to drain away from the tracks. The concrete stairs at the north-western and south-eastern ends of the platforms, dating to the middle of the twentieth century. The small steel staircase, balustrade and concrete slab at the north-western end of Platform 3/4 date to the second half of the twentieth century. The services, tactiles and loop-top fencing balustrades are aesthetically intrusive.	Overall: Moderate Concrete capping and steel, concrete facing and cast iron grated drains, concrete stairs, garden beds: Moderate Steel staircase, balustrade and concrete slab at the north-western end of Platform 3/4, asphalted surfaces, stanchions, lights, sub-surface fill, benches: Little Services, tactiles and loop-top style balustrades: Intrusive

Component	Assessment	Grading
Retaining Walls	The retaining walls date to the middle of the twentieth century, installed as part of the preparation works for the quadruplication of the line. As such, the retaining walls are of moderate aesthetic and historical significance for their contribution to the wider setting of the heritage item and the history of alterations to the station between 1937 and 1988.	Moderate
Signal Box	The signal box located at the south-eastern end of Platform 3/4 is an early component of the station integral to the running of the station.	Moderate
Signal/Communications Box	The signal box/communications box located at the north-western end of Platform 3/4 is a late twentieth-century element of the station associated with the running of the station.	Little

Listed heritage items

The desktop search identified the Denistone Railway Station Group as being listed on TAHE Section 170 Register (SHI No.4801907). A summary of this item is provided below.

Denistone Railway Station Group

Denistone Railway Station Group is listed on the Transport (TAHE) Section 170 Heritage and Conservation Register (#4801907).

The following Statement of Significance for *Denistone Railway Station Group* has been reproduced from the RailCorp Heritage and Conservation Register, as provided in the online State Heritage Inventory database (OEH, 2021):

> *Denistone Railway Station is of local significance as one of a number of inter-war railway stations in NSW that collectively demonstrate changes taking place in society between the wars, a time of great social upheaval in the aftermath of WWI and the Great Depression, with WWII looming. Its design tangibly demonstrates the railway's response to these wider social changes and the impacts they had on architectural design at the time. As an example of an austere, domestic-scale, Inter-War railway station the place has direct associations with Chief Civil Engineer, Albert Fewtrell, whose appointment in 1932 signalled a departure from old architectural notions (based on Victorian & Edwardian period styles) as the railways began to experiment with new domestic architectural models and adapting them for railway use.*
>
> *Denistone is the only station of its type in NSW to retain all its original elements in largely unmodified form and in a setting of domestic housing of a similar period and scale, which retains its historic setting with a rare and exceptional degree of integrity. It is in near-original condition and retains all of its key elements from the opening of the station in 1937. The high degree of integrity of Denistone Station, enhances its ability to demonstrate Fewtrell's influence on railway design in the Inter-War period and the integrity of the station within its historic setting, effectively retains the ability of the site to evoke life in suburban Sydney in the mid twentieth century. The footbridge and overhead booking office are of exceptional heritage significance, and contribute strongly to an intact Sydney suburban ensemble from the 1930s.*

Further information regarding the Denistone Railway Station Group heritage item is provided in Section 2 of the *Statement of Heritage Impact*.

Other listed heritage items within the vicinity of the Proposal

A series of additional heritage items of local significance and a heritage conservation area have been identified on the Ryde LEP as being within the vicinity of the Proposal. These are summarised in Table 6-11. No other heritage items listed on the World, Commonwealth or National Heritage Lists, the Register of the National Estate or NSW State Heritage Register have been identified within the vicinity of the Proposal.

Table 6-11 Heritage listings in the vicinity of the Proposal

Item	Address	Significance	Listing	Place ID (Item No.)	Distance from Proposal site
Denistone Station					
Denistone Railway Station Group	West Parade, Denistone, NSW 2114	Local (with State significant elements)	TAHE s170	SHI # 4801907	Within
Heritage Conservation Areas					
Darvall Estate, Denistone	Denistone	Local	Ryde LEP 2014	LEP # C7	Adjacent (refer text below table)
House	38 Miriam Road	Local	Ryde LEP 2014	LEP # 220	60m
House and garden	34A Miriam Road	Local	Ryde LEP 2014	LEP # 303	95m
Street Trees	Part of Anthony Road, Miriam Road and Reserve Street	Local	Ryde LEP 2014	LEP # 301	90m
House	30 Miriam Road	Local	Ryde LEP 2014	LEP # 75	140m
“Denistone House” and “Trigg House” (Ryde Hospital)	1 Denistone Road, Eastwood	Local	Ryde LEP 2014	LEP # 47	195m
	Denistone, Ryedale Rd, Florence, Fourth Avenue, Eastwood	Local	Health s170 (Denistone House only)	SHI # 3540681	195m
	Denistone Road within Ryde District Soldiers Memorial Hospital, Eastwood	N/A	National Trust Register	7314	195m
Open Space	Darvall Park, Chatham Road	Local	Ryde LEP 2014	LEP # 26	130m

Figure 6-16 Heritage items and curtilages of the Denistone Railway Station Group and other heritage items in the vicinity of the Proposal

Darvall Estate, Denistone Heritage Conservation Area

Immediately south of the Proposal is the Darvall Estate Heritage Conservation Area (HCA). While the Proposal site overlaps this HCA there is not anticipated to be any direct impact as a result of the Proposal. The Ryde LEP 2014 describes the HCA as below:

> *The Darvall Estate Heritage Conservation Area is culturally significant at a local level as a highly intact example of an early twentieth century subdivision in the Ryde area. It is historically significant for its association with the Darvall family, particularly Anthony Darvall, an alderman of Ryde who was responsible for the first subdivisions of the family estate, and for its demonstration of early town planning principles. It has aesthetic value for its high proportion of original building stock, with many high-quality homes built to a strict building covenant and representing a range of architectural styles from the late Federation and early interwar period. The area as a whole is representative of the boom in suburban development in the Denistone/Eastwood area in the early twentieth century as early land grants began to be subdivided and train stations were opened along the rail line.*

A map of the heritage items and places surrounding Denistone station are shown in Figure 6-16.

Archaeological potential

There is a low potential for subsurface remains related to the development of Denistone Station from 1937 – 1988, these remains would not be considered to meet the threshold for local significance. No other archaeological potential has been identified for all other phases of development within the Proposal site. As such, there are no predicted significant archaeological remains within the Proposal site at Denistone Station.

6.5.2 Potential impacts

c) Construction phase

A summary of the potential impacts of the Proposal during the construction phase of the Proposal is provided below. Further discussion of the potential impacts is provided in Chapter 8 of the *Statement of Heritage Impact*.

Assessment of heritage impacts to Denistone Station

Table 6-12 outlines the potential impacts of the work upon the heritage significance of Denistone Station.

Table 6-12 Potential construction impacts to heritage associated with the Proposal

Component	Impact	Assessment
Overhead booking office	The proposed works would include the replacement of the awning facing Gordon Crescent, replacement of the soffit and inclusion of linear lighting elements. Views from the road bridge and platforms to the overhead booking office would be interrupted by the new lifts.	The works to the overhead booking office would result in a **minor** direct impact to the overhead booking office and a **negligible** direct impact to Denistone Station. The visual impact to the overhead booking office would be **moderate** and would have a **moderate** impact on the significance Denistone Station overall.

Component	Impact	Assessment
Footbridge	The installation of the new lifts would require the removal of two sections of the steel balustrade. The balustrades along the footbridge and staircase would be repainted. New compliant handrails would be fixed atop the existing handrails. Landings and stair surfaces would be upgraded and levelled with new compliant nosing and tactile indicators. Views to and from the footbridge would be interrupted by the new lifts.	The works to the footbridge would result in a **moderate** direct impact to this exceptionally significant element of the station and an overall **moderate** direct impact to Denistone Station. The visual impact to the footbridge and Denistone Station would be **moderate.**
Station building on Platform 1/2 (also referred to as the 'Conveniences Building')	The existing female bathroom would be modified to accommodate a family accessible toilet and storeroom, while the existing male bathroom would be replaced with an ambulant toilet. The window facing north-west would be replaced with a compliant doorway altering the building form and fabric.	The works to the Conveniences Building would result in a **moderate** direct impact to the building and a **moderate** direct impact to the overall heritage significance of Denistone Station. The works to the Conveniences Building would result in a **minor** visual impact to the building, and views to the building, and an overall **minor** visual impact to the heritage significance of Denistone Station.
Station building on Platform 3/4 (also referred to as the 'Shelter Shed')	The proposed works would remove the existing concrete slab within the waiting room to enable level access. This would remove a row of bricks along the entrance.	The works would result in a **minor** direct and indirect impact to the Shelter Shed, whilst providing a positive impact for the equitable access of the space. Overall, the proposed works to the Shelter Shed would have a **negligible** direct and indirect impact to the heritage significance of Denistone Station.
Platforms	Lift pits would be required at the north-west end of both platforms. The lift shafts rising to the footbridge level would interrupt views to and from the platforms. Two new stand alone boarding assistance canopies would be provided on each platform. The platforms would be regraded between the new lifts and canopies. A new drinking fountain, audio system, signage, seating and tactile indicators would be provided on the platforms.	The works to the platforms would result in a **minor** direct impact to the platforms and a **minor** overall direct impact to Denistone Station. The works to the platforms would result in a **minor** visual impact to the platforms and the heritage significance of Denistone Station overall.
Gordon Crescent commuter car park	The commuter carpark would include a new DDA compliant carpark, leveling and a new curb ramp to comply with access requirements. A kiss and ride zone with seating would be established on Gordon Crescent.	The works to the commuter car park and access would result in a **neutral** direct impact to Denistone Station, and a **negligible** visual impact to the setting of the heritage listed station.

Component	Impact	Assessment
Ancillary components	Low and high voltage electrical works would be required across the station to support the new infrastructure. CCTV and lighting to be upgraded across the station.	No works are proposed to be undertaken to the retaining walls, the signal box at the south-eastern end of Platform 3/4 and the signal/communications box at the north-western end of Platform 3/4. The works would result in **neutral** direct and visual impacts to these elements of the station.

Summary of heritage impacts to Denistone Station

Overall, the Proposal would result in an overall **moderate** direct (physical) and visual (indirect) impact to the significance of Denistone Station. This is principally due to the addition of the two new lifts shafts and the alterations to the highly significant station platform buildings, the exceptionally significant footbridge and the moderately significant platforms.

A summary of the overall impacts to the key elements of the station is provided in Table 6-13.

Table 6-13 Overview of direct (physical) and visual (indirect) impacts to key elements of Denistone Station

Component	Overall Significance	Direct impact to element	Visual impact to element	Direct impact to Denistone Station	Visual impact to Denistone Station
Road Bridge	Moderate	Negligible	Moderate	Neutral	Minor
Overhead Booking Office	High	Minor	Moderate	Negligible	Moderate
Footbridge	Exceptional	Moderate	Moderate	Moderate	Moderate
Station Building on Platform 1/2 (‘Conveniences Building’)	High	Moderate	Minor	Moderate	Minor
Station Building on Platform 3/4 (‘Shelter Shed’)	High	Minor	Minor	Negligible	Negligible
Platforms	Moderate	Minor	Minor	Minor	Minor
Retaining Walls	Moderate	Neutral	Neutral	Neutral	Neutral
Signal Box	Moderate	Neutral	Neutral	Neutral	Neutral
Signal/Communications Box	Little	Neutral	Neutral	Neutral	Neutral

Summary of heritage impacts to nearby heritage items

There are several heritage items located within the vicinity of Denistone Station. These items would not incur any physical heritage impacts from the proposed works. However, the visual heritage significance of some of these items may be affected by the proposed works. Impacts to heritage views and vistas to these items are outlined in Table 6-14 below.

Table 6-14 Potential indirect (visual) heritage impacts to nearby heritage listed items

Item name and listings	Potential indirect (visual) heritage impacts
Darvall Estate, Denistone (Ryde LEP 2014, LEP #C7)	The proposed lift structures would be constructed adjacent to the north-eastern border of the HCA. At this distance, the new works be visible from the HCA and would partially obstruct the views of the road bridge and overhead booking office of Denistone Station from the HCA. However, the works would not overshadow or obstruct views within the HCA itself. The proposed works would result in a **minor** indirect (visual) heritage impact to the setting of the HCA but would result in a **neutral** indirect (visual) heritage impact to the significant views of the HCA. The works would result in an overall **minor** (visual) impact to the HCA.
Local Heritage Items (Ryde LEP 2014, LEP # 220, 303, 301, 75, 47, 26)	The proposed lift structures would be constructed at least 125 metres from the surrounding heritage items, while the general Proposal site is at least 60 metres from the local heritage items. At this distance, the works would only be slightly visible or not visible from only the front entrance of the heritage items. The works would not overshadow or obstruct significant views of the heritage items at this location. The proposed works would result in a **negligible** indirect (visual) heritage impact to the setting of the items but would result in a **neutral** indirect (visual) heritage impact to the significant views of the items. The works would result in an overall **negligible** (visual) impact to the surrounding local heritage items.

Statement of heritage impact

A statement of heritage impact has been prepared according to NSW Heritage Office guidelines (NSW Heritage Office, 2002b) in Table 6-15 below.

Table 6-15 Statement of heritage impact

Statement	Response
The following aspects of the Proposal respect or enhance the heritage significance of the item or conservation area for the following reasons	The proposed upgrades at Denistone Station would result in providing a positive outcome for the equitable access of the station, ensuring the accessibility, usability and safety of the station for all users. The works would ensure the continued use of the station into the future. The works would not impact any significant archaeological remains, 'relics' features or structures. The works would respect the fabric and visual significance of the retaining walls, the signal box and communications box, as elements of moderate to little significance. Similarly, the works would result in only neutral to negligible visual impacts and no direct physical impacts to the setting and significant views of the heritage items in within the 200m buffer of the Proposal site, which are listed on the Ryde LEP 2014. The works would result in a minor indirect (visual) heritage impact to the setting of the adjacent Darvall Estate, Denistone HCA (Ryde LEP 2014, LEP # C7), but would result in a neutral indirect (visual) heritage impact to the significant views of the HCA. Overall, the visual impacts to the HCA (LEP # C7) would be minor and the visual impacts to the nearby heritage items would be neutral to negligible.

Statement	Response
The following aspects of the Proposal could detrimentally impact on heritage significance. The reasons are explained as well as the measures to be taken to minimise impacts:	The proposed upgrades have been assessed as resulting in an overall moderate direct physical and visual impact to the significance of Denistone Station. This is principally due to the addition of the two new lifts shafts and the alterations to the highly significant station platform buildings, the exceptionally significant footbridge and the moderately significant platforms. The TAP upgrade is required in order to improve the accessibility, usability and safety of the station for all users, which would result in a positive outcome for all users. The following aspects of the proposed works could have a detrimental impact on the heritage significance of the station, grouped by the affected element. Note that only the key aspects of the Proposal are described below: **Road Bridge** The installation of the two new lifts in close proximity to the road bridge would result in a moderate visual impact to the significant views and setting of the road bridge, and an overall minor visual impact to Denistone Station. There are no direct physical impacts to the road bridge. **Overhead Booking Office** The installation of the two new lifts in close proximity to the overhead booking office, as an element of high significance, would result in a moderate visual impact to the significant views and setting of the building, and an overall moderate visual impact to Denistone Station. The replacement of the overhead booking office awning and ceiling of the covered concourse walkway with contemporary Art Deco style counterparts would result in a minor direct physical impact and minor positive visual impact to the overhead booking office as a component of high significance to Denistone Station. The works would result in an overall minor direct physical impact and a negligible positive visual impact to Denistone Station. The replacement of the loop-top fencing along the south-eastern edge of the footbridge with a new perforated aluminium enclosure would result in an overall minor direct physical impact to the overhead booking office and a negligible visual impact to Denistone Station. **Footbridge – including Ticket Office** The works to the footbridge, comprising the installation of adjacent lifts, removal of balustrades, installation of new concrete slabs/toppings, alterations to the handrails, new nosings and tactiles and removal of the phone booth, would result in a moderate direct physical and visual impact to the footbridge. This is primarily due to the removal of isolated portions of the balustrades which is exceptionally significant fabric, the extensions to the handrails and the obstruction of significant views by the two new lifts. The works would result in a moderate visual impact to the significant views and setting of Denistone Station and an overall moderate direct physical impact to the significance of the Station. **Station Building on Platform 1/2 (Conveniences Building)** The works to the Conveniences Building, comprising upgrades to the bathrooms and waiting room to allow for accessibility requirements, would result in a moderate direct physical and visual impact to the building as an item of high significance within the station. This is primarily due to the removal of original fabric and reduction of the legibility of the original layout and level of the interior, as well as the removal of significant original brickwork along the exterior of the building to allow for the accessible entrances. The works would result in a moderate visual impact to the significant views and setting of Denistone Station.

Statement	Response
	Station Building on Platform 3/4 (Shelter Shed) The works to the Shelter Shed, comprising the demolition and levelling of the existing tiles and concrete slab of the waiting room to allow for level access, would result in a minor direct physical and minor visual impact to the building as an item of high significance within the station. This is primarily due to the removal of fabric mostly dating to the second half of the twentieth century, a course of bricks along the front entrance and reducing the original level of the interior. The works would result in a negligible visual impact to the significant views and setting of Denistone Station and an overall negligible direct physical impact to the significance of the Station. **Platforms** The works to the platforms, comprising excavation works for the lifts, regrading, trenching, removal of service stairs from the platform to the rail corridor, replacement of cast iron drains, installation of boarding assistance zone canopies, signage, services, audible system, tactiles, yellow lines and a bubbler, would be required to improve the accessibility and safety of the platforms. The works would result in a minor direct physical impact to the platforms as elements of moderate significance and a minor visual impact to the platform, views and setting. The platform would result in an overall minor direct physical and visual impact to the Station.
	Gordon Crescent commuter Car Park The works to the existing Gordon Crescent commuter car park and access to the north of Denistone Station would be required as part of the proposed upgrades in order to achieve the accessibility requirements. The works would be visually similar to existing. These works would be located outside of the curtilage of the heritage item of Denistone Station and as such would result in a neutral direct physical impact to the station and a negligible visual impact to the setting of the heritage listed station. **All areas** Electrical work across the station, including additional lighting, CCTV cameras and electrical conduits, would aid in improving the safety and security of the station. These works would result in a negligible to minor visual and direct physical impact to the station. Further minimisation of the resultant impact would be undertaken through careful sympathetic designs in consultation with the nominated Heritage Consultant and Transport. Recommendations are provided in Section 6.5.3 of this report in order to mitigate heritage impacts.
The following sympathetic solutions were previously considered and have been removed from the current scope of works for the following reasons	The proposed design has been prepared in consultation with the nominated Heritage Architect and the Transport for NSW Heritage Specialist. As such, the proposed design has been chosen to minimise impact to significant fabric and to minimise visual impact, whilst ensuring the delivery of the proposed upgrades. The Proposal originally involved more extensive modifications to the footbridge of exceptional significance and the road bridge of moderate significance, involving the extension of the concourse, the removal of balustrading along the side elevations of the footbridge and the removal of sections of the brick balustrading of the road bridge. These works have been removed from the Proposal in order to minimise the impact to the significant elements of the station and the overall station. Further minimisation of the resulting impacts would be undertaken through careful sympathetic detailed designs in consultation with the nominated Heritage Architect and Transport for NSW Heritage Specialist . The recommendations provided in Section 6.5.3 of this report would be followed in order to mitigate heritage impacts.

d) Operational phase

The Proposal would result in some impacts to significant building fabric items and views. Impacts would be mitigated through the measures described below.

6.5.3 Mitigation measures

A number of site-specific mitigation measures are proposed with respect to potential non-Aboriginal heritage impacts:

- all staff, including design professionals and tradespeople, involved in the proposed works must receive a heritage induction prior to the commencement of works. The heritage induction would cover the heritage significance of Denistone Station, identification of significant fabric and the recommendations and mitigation methods
- in accordance with Section 170a of the *Heritage Act 1977*, Sydney Trains would provide notification of the work to Heritage NSW 14 days prior to the commencement of the work
- all works would be undertaken by contractors with demonstrated specialist heritage skills and an understanding of heritage conservation principles. The work would be monitored by a suitably experienced heritage specialist
- protective hoarding or splash protection would be installed around significant features, such as the platform buildings and the overhead booking office, prior to works in the vicinity of these features in order to protect them from physical damage and particles such as paint, dirt, dust or mud
- works resulting in the removal of existing bolts into significant fabric, such as the footbridge concrete slab and the road bridge brick balustrade, would include patching using suitable materials. For the brickwork, patching would be undertaken with non-cementitious lime mortar coloured to match the brickwork. For the concrete, patching would utilise a concrete with aggregate and colour to match the existing as close as possible
- all works are to be undertaken in accordance with the principles and objectives of the *Burra Charter: the Australia ICOMOS Charter for the Conservation of Places of Cultural Significance* (the *Burra Charter)*
- where possible, all works would be reversible, in correspondence with the principles and objectives of the Burra Charter
- the works to the station would aim at ensuring the retention and enhancement of the cultural significance of the significant elements, including the footbridge, overhead booking office, platforms, retaining walls and road bridge
- as part of the Proposal, condition inspections would be undertaken prior to, during and following completion of works. All repairs are to be undertaken in consultation with the nominated heritage consultant and the heritage advisors at Transport for NSW
- it is recommended that further research and comparative assessments are made for each impacted element of the station, including the platforms, overhead booking office, road bridge and footbridge to support the ongoing conservation of these elements in the future and as part of future works at the station

- a Photographic Archival Recording (PAR) of Denistone Station, its setting, context and significant views, must be prepared prior to the commencement of works and following completion of works. This recording must be in accordance with the NSW Heritage Division publication *Photographic Recording of Heritage Items using Film or Digital Capture* (2006). The digital copy of the archival record would be provided to Heritage NSW and Transport for NSW. It is recommended that the PAR includes copies of the existing structural designs, a fabric analysis and existing uses of the rooms/buildings
- should unexpected archaeological remains be found during excavation works, the Transport Unexpected Finds Policy would be followed. This may involve localised work stoppages, on-site assessment and further approvals from Heritage NSW prior to works recommencing
- a Heritage Interpretation Strategy would be prepared prior to the commencement of construction work at Denistone Station in order to communicate the history and significance of the station to users, utilising a range of interpretative media. The strategy would consider a range of options of interpretation including but not limited to the retention of significant fabric in situ, signage panels and graphic media
- in the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019d) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Senior Environment and Sustainability Officer or Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and Heritage NSW. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to work recommencing at the location.

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

6.6 Socio-economic impacts

6.6.1 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 low-density residential properties. The closest residences are approximately 30 metres from the Proposal site, on West and East Parade. There are no existing businesses located within the immediate vicinity of the Proposal.

Other community locations and facilities located within the broader area include:

- Symons Reserve (adjacent to the Proposal site to the north)
- Darvall Park (around 300 metres west of Denistone Station)
- Denistone Sports Club (around 380 metres south-west of Denistone Station)
- Ryde Hospital (around 480 metres north-east of Denistone Station)

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

- local residents, particularly on Gordon Crescent, West Parade and East Parade
- commuters including train passengers using Denistone station.

Demographics

A review of the 2016 Australian Bureau of Statistics (ABS) Census data was undertaken for Denistone (ABS, 2016). The suburb of Denistone has:

- a population of around 4,000 people with a median age of 42 years
- of this population:
    - there were around 225 children aged between 0 and 4 (around five percent of the population)
    - around 620 people aged over 65 (around 16 percent of the population)
    - around 96 per cent of the population were identified as being employed
    - 20 percent travelled to work via train, which was the second most common mode of travel to work.

Strategic outlook

The *City of Ryde Community Strategic Plan* (City of Ryde, 2018) identified that in 2016 there were 116,302 people in the LGA, and of these 5,347 were people living with a disability. This is around 4.6 percent of the population of the LGA.

Some of the challenges facing Ryde LGA into the future include:

- a growing population and increasing pressure on housing supply
- demographic changes including an increasing in the number of people reaching retirement age
- climate change and the increase in the number and intensity of hot days and nights
- managing traffic congestion with an increase in population.

The modes used to access Denistone Station are summarised in Section 6.1.1. The largest access mode for the station is walking (78 percent) while 11 percent of customers accessed the station by car making use of the nearby commuter carpark facilities.

6.6.2 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 to, through and around the station
- temporary closures of Denistone Station to accommodate construction work (as part of scheduled rail possession/shutdown periods)
- temporary disruptions to station facilities and amenities (e.g. seating, toilets, drinking fountain, telephone booth)
- temporary impacts to local traffic movements due to a minor increase in truck movements in the area, delivering site materials, plant and equipment
- temporary loss of 10 parking spaces at the Kinson Crescent commuter carpark during construction
- temporary impacts to the parking availability in the vicinity of Denistone Station to accommodate for construction worker parking

- 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.

Access to the identified community facilities (such as the local parks/reserves, sports club, hospital etc) are not anticipated to be affected by the construction of the Proposal.

Construction work would be managed to ensure pedestrian and cyclist access to and through the station and station precinct 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.

Further details regarding potential impacts such as potential disruptions to pedestrians accessing the station, the impacts as a result of the temporary loss of parking and bicycle parking facilities etc is provided in Sections 6.1. The potential visual and noise amenity impacts arising as a result of the construction of the Proposal are also similarly discussed in Section 6.2 and 6.3.

b) Operational phase

Overall, the Proposal would provide positive socio-economic benefits to Denistone and the City of Ryde LGA, including:

- improved accessibility for customers at Denistone Station providing an accessible route to station platforms through the provision of upgraded footpaths and lifts, regraded platform surface and more accessible parking spaces
- improved customer amenity and facilities at the station including new canopies, seating, adjusted drinking fountain and new tactiles and wayfinding signage
- DDA parking space and a new kiss and ride zone at the Gordon Crescent commuter carpark
- a new family accessible toilet and a unisex ambulant toilet to replace the existing male and female toilets
- potential increased use of public transport to, and from, Denistone due to increased accessibility
- additional lighting and CCTV which would provide positive CPTED outcomes for the area.

Strategic outlook

The Proposal would provide the current and future local Denistone community with a range of socio-economic benefits by aligning with key strategic priorities for the area. As outlined in Section 2.1, the Proposal is also consistent with the local strategic plans for the City of Ryde including:

- the *City of Ryde Community Strategic Plan* (City of Ryde, 2018) by providing improved transport access opportunities for an LGA demographic identified as increasing in older people (and requiring improved access opportunities)
- the *Local Strategic Planning Statement 2020* (City of Ryde, 2020) in that the Proposal would improve the 'liveability' of the LGA by providing increased access to public transport.

6.6.3 Mitigation measures

Mitigation measures are proposed to manage potential socio-economic impacts including measure to identify relevant affected stakeholders and measures designed to require maintenance of ongoing contact with the local community during construction of the Proposal.

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

6.7 Biodiversity

This section provides a summary of the potential biodiversity impacts. This section has been informed by an *Arboricultural Impact Assessment* prepared by Tree Survey (2021).

6.7.1 Existing environment

The existing environment within the Proposal site was typically comprised of ornamental planted exotic and native garden specimens along with a small area of exotic perennial grasses. No threatened ecological communities were identified within areas with the potential to be impacted by the Proposal.

The streetscapes adjacent to the Station are characterised by a diversity of native and exotic plant species and is located adjacent to Symons Reserve which may contain remnants of Blue Gum High Forest and Turpentine Ironbark Forest communities (both listed as critically endangered ecological communities under the EPBC Act). Darvall Park (towards the western end of the Proposal site) also contains Blue Gum High Forest that has been restored by volunteers.

Flora

A total of 54 trees on site were assessed for their tree retention value. Of these, 29 were assessed as having high retention value, nine were assessed as having moderate retention value, and 16 were assessed as having low retention value. The location of these trees are shown in Chapter 4 of the *Arboricultural Impact Assessment*.

The species within the Proposal site includes (see Figure 6-17to Figure 6-19 for examples of trees surrounding the site):

- Sydney Blue Gum – *Eucalyptus saligna*
- Narrow-leaved Ironbark – *Eucalyptus crebra*
- Sweet Pittosporum - *Pittosporum undulatum*
- Griffith's Ash – *Fraxinus griffithii*
- Frangipani - *Plumeria sp.*
- Tallowwood – *Eucalyptus microcorys*
- Sydney Red Gum – *Angophora costata*
- Weeping Bottlebrush – *Melaleuca viminalis*
- Black Tea-tree – *Melaleuca bracteate*
- Lemon-scented Gum – *Coyrmbia citriodora*
- Spotted Gum – *Corymbia maculata*
- Blackbutt – *Eucalyptus pilularis*

Figure 6-17 *Frangipani* (left) and Griffith's Ash (*right)* located on Platform 1/2

Figure 6-18 Vegetation located south-east of the commuter carpark in Symons Reserve

Figure 6-19 Vegetation located adjacent Kinson Crescent commuter carpark adjacent to the proposed compound location

6.7.2 Potential impacts

a) Construction phase

Of the 54 trees assessed on site, none are proposed to be removed. Various construction activities would occur within the tree protection zones (TPZ) of two trees within the Proposal site (associated with the proposed car park works). The resurfacing works to the platform would also be within the vicinity of up to four existing platform trees.

The encroachment is considered minor and is highly unlikely to impact the overall health or condition of these trees provided that mitigation measures outlined in Section 6.7.3 are implemented. Minor vegetation trimming may be required to accommodate site access and construction clearances

The Proposal would require the removal of groundcover within the rail corridor for the proposed construction laydown area to the north of the platforms and around the commuter carpark during construction. It is not anticipated that any shrubs would require removal.

The Proposal would not require any vegetation removal in Darvall Park or Symons Reserve that are associated with the Blue Gum High Forest and Turpentine Ironbark Forest communities.

b) Operational phase

The operation of the Proposal is not anticipated to result in any further impacts to biodiversity. The proposal would include planting of new trees within the Gordon Crescent commuter car park and these trees would be selected based on low maintenance and low water usage qualities.

6.7.3 Mitigation measures

Construction of the Proposal must be undertaken in accordance with the Transport for NSW *Vegetation Management (Protection and Removal) Guideline* (2019e) and the Transport for NSW *Fauna Management Guideline (2019f).* Various controls for the protection of biodiversity and trees on site would be incorporated into the Construction Environmental Management Plan (CEMP) and implemented during construction work, including:

- disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal
- A Tree Protection Plan and tree protection measures has been prepared for the Proposal (refer to the *Arboricultural Impact Assessment* report by Tree Survey, 2021). Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the *Arboricultural Impact Assessment* (Tree Survey, 2021). Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs
- resurfacing of the station platform surface or areas within the Gordon Crescent carpark would be undertaken via tree sensitive construction measures where works occur within identified TPZs
- platform resurfacing would not encroach into the area of the existing planter boxes associated with trees 22, 23, 24 and 28 (as referenced in the *Arboricultural Impact Assessment* report by Tree Survey, 2021)
- lighting would be designed to minimise spill into surrounding areas as far as practical to avoid impacts upon native fauna
- where tree trimming is required:
    - pruning would not exceed 10 percent of the overall canopy volume
    - no limbs greater than 150 millimetres in diameter are to be removed
    - the final pruning cut shall be at the branch collar in accordance with AS4373-2007
    - all tree pruning work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture, in accordance with Australian Standard AS4373-2007, Pruning of Amenity Trees, and the NSW WorkCover *Code of Practice for the Amenity Tree Industry* (1998).

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

6.8 Contamination, landform, geology and soils

6.8.1 Existing environment

Landform, geology and soils

Landform

The natural topography in the vicinity of the station is undulating topography, generally sloping from north to south with steeper sections towards the southern end and approaches to the station from the south. The suburb of Denistone sits at an elevation of around 100 metres above sea level. The train line elevation increases to the north, rising to around 50 metres within the immediate area while staying around 40 metres to the south. However, Denistone Station is in a cutting generally below the level of the existing landforms and street network.

Soils

The Proposal is underlain by Wianamatta Group Ashfield Shale and Bringelly Shale formations. A review of the Atlas of Australian Soils (CSIRO) indicates that the soil profile in Denistone is predominantly Kurosols, having a high soil erosion hazard due to poor infiltration.

Acid sulfate soils

A review of the Australian Soil Resource Information System National Acid Sulfate Soils Database on 7 July 2021 indicated that the Proposal site is classified as 'B4 –low probability/very low confidence' of occurrence of acid sulfate soils (CSIRO, 2014).

Contamination

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

A search of the public register of notices issued by the NSW EPA under *Contaminated Land Management Act 1997* was conducted in September 2021 and found that there are no sites with notices within 500 metres of the Proposal. Therefore, this indicates that there are no sites in the vicinity of Denistone Station that are identified as contaminated to an extent that warrants regulation.

6.8.2 Potential impacts

a) Construction phase

The Proposal would require minor excavation work for the installation of the lift foundations and pits. Other minor trenching or excavation may be required for footpath and road work and relocation of services.

Soil disturbance

Excavation and other earthworks such as 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 nuisance to community members and/or lead to an adverse environmental impact on biodiversity, for example through the introduction of sediment into waterways. These impacts are expected to be minor due to the limited level of ground disturbance required for the Proposal and the relatively flat topography and stability of the Proposal site.

Erosion risks can be adequately managed through the implementation of standard measures as outlined in *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) (the Blue Book).

Contamination

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

The Proposal has the potential to disturb asbestos containing material and other hazardous substances (such as lead paint) from the reconfiguration of the toilets 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).

b) Operational phase

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

6.8.3 Mitigation measures

As part of the CEMP, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' Managing Urban Stormwater: Soils and Construction Guidelines (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of work and maintained throughout construction

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

6.9 Hydrology and water quality

6.9.1 Existing environment

Surface water

A review of maps of the area indicates that there are no surface water bodies in the vicinity of the station. The nearest water bodies appear to be Archer Creek to the south-west and Shrimptions Creek to the east. At their nearest point these surface water bodies are 1.2 kilometres and two kilometres from the station respectively.

A review of the City of Ryde LEP indicated that the Proposal site is not located within a flood planning area due to the elevation and topography of the local area. However, Denistone Station is a low-lying feature within the local landscape within a cutting, and as such, may be subject to localised flooding during high rainfall events as a function of the low-lying topography.

It is expected runoff from the rail corridor and station area would generally discharge through to local Council as part of the wider Council-managed stormwater system.

Groundwater

Depth to groundwater within the Proposal site is unknown. A search of the WaterNSW groundwater database indicates that there are no registered groundwater bores within 500 metres of the Proposal site. Recent geotechnical works did not identify any shallow groundwaters that would likely be impacted by the Proposal.

Given the nature of the surrounding locality as a highly developed urban area, it is considered unlikely that the groundwater in the area would be used for any sensitive purposes such as a source for drinking water. There is a reticulated drinking supply in this area.

6.9.2 Potential impacts

a) Construction phase

Excavation activities during construction have the potential to impact on local waterways due to increased erosion and sedimentation from exposed soil and stockpiles. However, due to the minor extent of excavation proposed during construction, these impacts are expected to be negligible to minor.

The Proposal has the potential to increase pollutant loads within local waterways through the release of sediment and debris from excavation during construction. This would be somewhat naturally mitigated by the substantial separation between the Proposal area and nearby waterways. Archer Creek and Shrimptions Creek are the closest recognised waterways and are located around 1.2 and two kilometres away respectively from the Proposal. Despite this, it is recommended that suitable sediment control measures are implemented and maintained during construction. Should these be implemented, it is expected that the overall impact upon local waterways and their water quality would be negligible to minor.

There is not expected to be any groundwater impacts during construction as no deep excavations that may encounter the groundwater table are proposed and recent geotechnical investigations have indicated that the proposed excavations associated with the lift shafts are unlikely to encounter groundwater.

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

b) Operational phase

The Proposal is unlikely to have a major impact on the hydrology of the Proposal site or the surrounding area.

Regrading of the platform surface and upgrading of the footpath and kerb 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 likely be within the capacity of the stormwater network and as such, impacts would be minor. Additionally, given the Proposal would not result in an increase of impervious surfaces, this would also ensure that surface water flows are not impacted during operation.

6.9.3 Mitigation measures

As noted in Section 6.8.3, a site-specific Erosion and Sediment Control Plan would be prepared and implemented for the Proposal to manage risks to water quality.

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

6.10 Air quality

6.10.1 Existing environment

Regional air quality

The broader Sydney East monitoring region provides the most representative air quality monitoring results for Warrawee, which sits roughly in between the Sydney East and Sydney north-west air monitoring regions. The Sydney East region includes air quality monitoring sites at Macquarie Park, Chullora, Rozelle, Lindfield, Randwick and Earlwood.

A search of the daily regional air quality index for the Sydney East region for last year showed that the region typically experiences a 'good' level air quality on most days.

Air pollutant sources

Based on the existing land uses surrounding the Proposal site, the existing air quality is considered to be characteristic of an urban environment. A search of the National Pollutant Inventory undertaken on 14 July 2021 for the 2019 to 2020 reporting period identified two air polluting sources in Ryde LGA:

- CSIRO North Ryde Life Sciences Centre
- Ryde Resource Recovery Centre

Other contributors to air quality within the study area would include emissions from motor vehicles on the surrounding road network, and the diesel trains on the adjoining rail corridor.

Sensitive receivers

Sensitive receivers in the vicinity of the Proposal include:

- local residents, particularly on Gordon Crescent, West Parade, East Parade, Anthony Road and Miriam Road
- Ryde Hospital
- commuters including train passengers using Denistone 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 (PM_{10}), 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 pits of the lifts
- demolition works associated with the bathroom modifications
- platform and footpath trenching and regrading
- stockpiling activities
- loading and transfer of material from trucks
- other general construction activities.

The Proposal would be likely to have a minimal impact on air quality as it would not involve extensive excavation or other land disturbance with the potential to generate significant quantities of dust.

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

b) Operational phase

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

Additionally, as the Proposal would increase access to public transport, the use of public transport is anticipated to increase and subsequently the amount of private vehicle related emissions would be slightly reduced in the long term.

6.10.3 Mitigation measures

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

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

6.11 Waste

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

- asphalt and concrete
- earthworks spoil
- building material wastes (including metals, timbers, plastics, concrete and carpeting)
- electrical wiring and conduit waste (from electrical connections)
- fuels, liquids and chemicals
- demolition waste from the existing footpaths, 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 to 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 the area tidy and free of rubbish.

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

6.12 Sustainability

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

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

6.13 Climate change

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.

Projects are required to establish a baseline footprint using the Carbon Estimate and Reporting Tool (CERT) or other approved modelling tools and demonstrate a reduction of construction related greenhouse gas emissions of at least five per cent from the established project baseline.

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

It is anticipated that, once operational, the Proposal may result in an increase in use of public transport and a relative decrease in use of private motor vehicles by commuters to travel to and from Denistone. 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.

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to the changes in climate and understand the limitation of adaptation. The effects of climate on the Sydney region can be assessed in terms of weather changes, storm intensity, flooding and increased risk of fire.

Climate change could lead to an increase in the intensity of rainfall events, whereby the rainfall excepted to occur in a 100-year average recurrence interval flood event would occur more frequently. Such changes in weather in the region are unlikely to impact on the operation of the Proposal with respect to issues such as increased flooding (for more information on flooding refer to Section 6.9).

Climate change could lead to an increase in frequency and severity in bushfires. The Proposal is not situated on land mapped as bush fire prone, but would be designed with appropriate fire protection measures.

The detailed design would consider the impacts of climate change on the Proposal through:

- selection of materials for durability in extreme conditions and that minimise heat retention
- incorporate fire resistant/retarding materials wherever practicable
- incorporate engineering and design features to ensure structures are constructed to minimise direct impacts from severe storms and strong winds.

6.14 Greenhouse gas emissions

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

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

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

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

6.15 Services/utilities

The Proposal has the potential to impact services such as from direct impact from excavation activities or from operation of other equipment, if services are not appropriately identified and protected or relocated. A DBYD search identified a number of utilities in the vicinity of the proposed work including:

- electrical services (aboveground)
- telecommunication services (underground)
- stormwater and water
- rail utilities, including signalling cabling and overhead wiring
- gas services.

Key services that may be impacted as part of the Proposal would include communications and low voltage cables in the location of the proposed lifts.

The detailed design of the Proposal would be undertaken to avoid services where feasible. Relocation or other work that may affect services would be undertaken in consultation with the respective utility authorities.

6.16 Cumulative impacts

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

A search of the Department of Planning and Environment's Major Projects Register and City of Ryde Council Development Application Register on 20 October 2021 identified no projects that would result in cumulative impacts with the Proposal other than two modification residential Development Applications for minor works.

During construction, the work would be coordinated with any other construction activities in the area, as required. Consultation and liaison would occur with City of Ryde Council, TAHE. Sydney Trains, and any other developers identified, to minimise cumulative construction impacts such as traffic and noise. Traffic associated with the construction work is not anticipated to have a significant impact on the surrounding road network. Operational traffic and transport impacts would have a minimal impact on the performance of the surrounding road network.

In addition, Transport for NSW has recently completed the upgrade of the West Ryde commuter car park (around 700 metres to the south of the Proposal site). This project is part of the NSW Government's Commuter Car Park Program. Construction of around 100 additional spaces was completed in November 2021. There may be some cumulative construction fatigue for local residents, in particular ongoing construction vehicle movements on West Parade.

Based on the identified potential cumulative projects, it is anticipated that the cumulative impacts would be negligible, provided that consultation with relevant stakeholders and mitigation measures in Chapter 7 are implemented.

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

7 Environmental management

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

7.1 Environmental management plans

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

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

7.2 Mitigation measures

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

Table 7-1 Proposed mitigation measures

No.	Mitigation measure
	General
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of *Environmental Management Plan Guideline – Guideline for Infrastructure Projects,* NSW Department of Planning, Industry and Environment, 2020) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the Contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An Environmental Controls Map (ECM) would be developed by the Contractor in accordance with Transport for NSW's *Guide to Environmental Controls Map* (TfNSW, 2019c) 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.

No.	Mitigation measure
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by Transport for NSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.
	Traffic and site access
8.	Prior to the commencement of construction, a Construction Traffic Management Plan (CTMP) would be prepared as part of the CEMP and would include at a minimum: • ensuring adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised • maximising safety and accessibility for pedestrians and cyclists • ensuring adequate sight lines to allow for safe entry and exit from the site • ensuring access to railway stations, parks and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made) • managing impacts and changes to on and off street parking and requirements for any temporary replacement provision • parking locations for construction workers away from stations and busy residential areas and details of how this will be monitored for compliance • routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses • details for relocating kiss and ride bay, taxi ranks and rail replacement bus stops if required, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired • measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the TMP. Consultation with the relevant roads authorities would be undertaken during preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction.
9.	Communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work.
10.	Road Occupancy Licences for temporary road closures would be obtained, where required.
11.	Scheduling of work and deliveries should be undertaken to avoid peak times and limit work in the road as much as practicable
12.	Suitable vehicle and pedestrian provisions would be maintained throughout construction to ensure that pedestrian connectivity is not impacted as a part of the work and that suitable and safe paths are provided.
13.	Qualified traffic controllers would be used during construction work to ensure safe and efficient movement of vehicle and pedestrian traffic on the surrounding roads as well as in and out of the construction site.
14.	Fencing and barriers would be installed between the construction site and outside the construction zone to ensure safe and easy navigation of pedestrians and cyclists.
15.	All work with the potential to impact pedestrian movements such as lift installation would be carried out during scheduled rail shutdown periods.

No.	Mitigation measure
	Urban design, landscape and visual amenity
16.	An Urban Design and Landscaping Plan (UDLP) for the Project shall be prepared and submitted to TfNSW for endorsement by the Precincts and Urban Design Team. The UDLP is to address the fundamental design principles as outlined in 'Around the Tracks' – urban design for heavy and light rail (TfNSW, Interim 2016). At a minimum, the UDLP shall: a) demonstrate a robust understanding of the Project site through a comprehensive site analysis to inform the design direction, demonstrate connectivity with street networks, transport modes, active transport options, and pedestrian distances b) identify opportunities and challenges c) establish site-specific principles to guide and test design options d) demonstrate how the preferred design option responds to the design principles established in 'Around the Tracks', including consideration of Crime Prevention through Environmental Design Principles. The UDLP is to include the Public Domain Plan for the chosen option and shall provide analysis of the: i. landscape design approach including design of pedestrian and bicycle pathways, street furniture, interchange facilities, new planting and opportunities for public art ii. materials schedule including materials and finishes for proposed built works, colour schemes, paving and lighting types for public domain, fencing and landscaping iii. an Artist's Impression or Photomontage to communicate the proposed changes to the precinct. The following design guidelines are available to assist and inform the UDLP for the Project: • *TAP Urban Design Plan Guidelines* (TfNSW, Draft 2018) • *Commuter Car Parks Urban Design Guidelines* (TfNSW, Interim 2017) • *Managing Heritage Issues in Rail Projects Guidelines* (TfNSW, Interim 2016) • *Creativity Guidelines for Transport Systems* (TfNSW, Interim 2016) • *Water Sensitive Urban Design Guideline SD-106* (TfNSW, 2017). The Urban Design Plan and Landscaping Plan shall be: I. prepared prior to concept design and finalised II. prepared in consultation with Local Council and relevant stakeholders III. prepared by a registered Architect and/or Landscape Architect
17.	All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to *AS 1158 Road Lighting* and *AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting.*
18.	The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.
19.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
20.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.

No.	Mitigation measure
21.	During construction, graffiti would be removed in accordance with Transport for NSW's Standard Requirements.
22.	Temporary access arrangements would be well signed and provide a visually legible route for pedestrians.
23.	Site equipment and facilities would be consolidated to maximise the area of useable public realm and maintain pedestrian permeability.
24.	A colour palette which is complementary to the heritage character of the station would be selected.
25.	Finishes and materials for the station would be complementary to the existing locality and landscape and reflective surfaces would be minimised with a preferred use of muted colours.
26.	Light spill from the construction area into adjacent visually sensitive properties would be minimised by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.
	Noise and vibration
27.	Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (TfNSW, 2019a) and the *Environmental Noise and Vibration Assessment* for the Proposal (WSP, 2021). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
28.	The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include: • regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise • avoiding any unnecessary noise when carrying out manual operations and when operating plant • ensuring spoil is placed and not dropped into awaiting trucks • avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable • switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded • avoiding deliveries at night/evenings wherever practicable • no idling of delivery trucks • keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site • minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios onsite; no dropping of materials from height where practicable, no throwing of metal items and slamming of doors.

No.	Mitigation measure
29.	The CNVMP would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered, include: • maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances • using the most suitable equipment necessary for the construction work at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours work • use of quieter and less vibration emitting construction methods where feasible and reasonable.
30.	Work would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any work outside these hours may be undertaken if approved by Transport for NSW and the community is notified prior to these work commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the Transport for NSW Senior Environment and Sustainability Officer or Manager for any work outside normal hours as per the Transport for NSW Construction Noise Strategy.
31.	As per the *Construction Noise and Vibration Strategy* (TfNSW, 2019b), construction activities with special audible characteristics (high noise impact, intensive vibration, impulsive or tonal noise emissions) would be limited to standard hours, starting no earlier than 8am; and to continuous blocks not exceeding three hours each with a minimum respite from those activities and work of not less than one hour between each block, unless otherwise approved by Transport for NSW.
32.	Blasting, where required, would be limited to between 9am and 5pm Monday to Friday and 9am and 1pm Saturday. There would be no blasting on Sundays or public holidays.
33.	Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible. This has the potential to reduce noise levels between 5 and 10 dB.
34.	To avoid structural impacts as a result of vibration or direct contact with structures, the proposed work would be undertaken in accordance with the safe work distances outlined in the *Environmental Noise and Vibration Assessment* (WSP, 2021) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
35.	Vibration (other than from blasting) resulting from construction and received at any structure outside of the project would be managed in accordance with: • for structural damage vibration –British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings Part 2 and German Standard DIN 4150:Part 3 – 1999: Structural Vibration in Buildings: Effects on Structures • For human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS 6472-2:1992 *Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).*

No.	Mitigation measure
36.	Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory work including jack hammering and compaction for all buildings/structures/roads with a plan distance of 50 metres from the work and all heritage listed buildings and other sensitive structures within 150 metres of the work (unless otherwise determined following additional assessment they are not likely to be adversely affected).
37.	During site establishment, lift, stairs and station building and platform work, use of the concrete saw is the main contributor to construction noise. The use of concrete saws would be limited where possible, and this work would be undertaken during standard hours where feasible. Where work is required outside of standard hours, the use of this equipment is to avoid sensitive periods such as after midnight and before 7am.
	Aboriginal heritage
38.	All construction staff would undergo an induction in the recognition of Aboriginal cultural heritage material. This training would include information such as the importance of Aboriginal cultural heritage material and places to the Aboriginal community, as well as the legal implications of removal, disturbance and damage to any Aboriginal cultural heritage material and sites.
39.	If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2019d) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Senior Environment and Sustainability Officer or Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Heritage NSW and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and Heritage NSW notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to work recommencing at the location.
40.	If human remains are found, work would cease, the site secured, and the NSW Police and Heritage for NSW notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to work recommencing at the location.
41.	The project would investigate opportunities for recognising and celebrating Aboriginal Culture during design and construction. Specific design responses and initiatives would be developed in consultation with key stakeholders. This approach is outlined in the TAP 3 Aboriginal Inclusion Plan.
	Non-Aboriginal heritage
42.	All staff, including design professionals and tradespeople, involved in the proposed works must receive a heritage induction prior to the commencement of works. The heritage induction would cover the heritage significance of Denistone Station, identification of significant fabric and the recommendations and mitigation methods included in this report.
43.	In accordance with Section 170a of the Heritage Act, Sydney Trains would provide notification of the work to Heritage Division 14 days prior to the commencement of the work.

No.	Mitigation measure
44.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2019d) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Senior Environment and Sustainability Officer or Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and Heritage NSW. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to work recommencing at the location.
45.	A suitably qualified and experienced heritage architect who is independent of the design and construction team's personnel would be engaged to provide ongoing heritage, design and conservation advice throughout detailed design and any subsequent relevant design modifications. The nominated heritage advisor would provide specialist advice throughout the detailed design phase to ensure that the final design adheres to the relevant strategies and the design recommendations in the SoHI (Artefact, 2021).
46.	All works would be undertaken by contractors with demonstrated specialist heritage skills and an understanding of heritage conservation principles. The work would be monitored by a suitably experienced heritage specialist.
47.	Protective hoarding or splash protection would be installed around significant features, such as the platform buildings and the overhead booking office, prior to works in the vicinity of these features in order to protect them from physical damage and particles such as paint, dirt, dust or mud.
48.	Works resulting in the removal of existing bolts into significant fabric, such as the footbridge concrete slab and the road bridge brick balustrade, would include patching using suitable materials. For the brickwork, patching would be undertaken with non-cementitious lime mortar coloured to match the brickwork. For the concrete, patching would utilise a concrete with aggregate and colour to match the existing as close as possible.
49.	All works are to be undertaken in accordance with the principles and objectives of the *Burra Charter: the Australia ICOMOS Charter for the Conservation of Places of Cultural Significance* (the *Burra Charter).*
50.	Where possible, all works would be reversible, in correspondence with the principles and objectives of the *Burra Charter.*
51.	The works to the station would aim at ensuring the retention and enhancement of the cultural significance of the significant elements, including the footbridge, overhead booking office, platforms, retaining walls and road bridge.
52.	As part of the Proposal, condition inspections would be undertaken prior to, during and following completion of works. All repairs are to be undertaken in consultation with the nominated heritage consultant and the heritage advisors at Transport for NSW.
53.	It is recommended that further research and comparative assessments are made for each impacted element of the station, including the platforms, overhead booking office, road bridge and footbridge to support the ongoing conservation of these elements in the future and as part of future works at the station.

No.	Mitigation measure
54.	A Photographic Archival Recording (PAR) of Denistone Station, its setting, context and significant views, must be prepared prior to the commencement of works and following completion of works. This recording must be in accordance with the NSW Heritage Division publication *Photographic Recording of Heritage Items using Film or Digital Capture* (2006). The digital copy of the archival record would be provided to Heritage NSW and Transport. It is recommended that the PAR includes copies of the existing structural designs, a fabric analysis and existing uses of the rooms/buildings.
55.	A heritage interpretation plan would be prepared and implemented for the station in accordance with Interpreting *Heritage Places and Items and the Sydney Trains Heritage Interpretation Guideline* and would investigate conservation works, integrated architectural responses and complementary interpretive signage. The Proposal is considered a medium project in terms of evaluating interpretation options and therefore a nominal score of 70 in accordance with the guidelines should be achieved.
56.	The contractor in collaboration with the Heritage Architect/Consultant must prepare and submit an illustrated services plan to detail all services routes in order to demonstrate compliance with the *Heritage Technical Note: Installation of New Electrical and Data Services at Heritage Sites (2017)*. The illustrated services plan should include, but not be limited to; high voltage (HV), low voltage, communications, PA and CCTV. The illustrated services plan must be submitted and approved by the TfNSW Heritage Specialist prior to the commencement of permanent works.
	Socio-economic
57.	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.
58.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
59.	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.
60.	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.
61.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed prior to construction.
	Biodiversity
62.	Construction of the Proposal must be undertaken in accordance with Transport for NSW's *Vegetation Management (Protection and Removal) Guideline* (TfNSW, 2019e) and Transport for NSW's *Fauna Management Guideline* (TfNSW, 2019f).
63.	All workers would be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity.

No.	Mitigation measure
64.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the *Arboricultural Impact Assessment* (Tree Survey, 2021). Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs.
65.	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 Senior Environment and Sustainability Officer or Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
66.	Should the detailed design or onsite work determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete Transport for NSW's *Tree Removal Application Form* and submit it to Transport for NSW for approval.
67.	For new landscaping work, mulching and watering would be undertaken until plants are established.
68.	Weed control measures, consistent with Transport for NSW's *Weed Management and Disposal Guideline* (TfNSW, 2019g), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the *Noxious Weeds Act 1993.*
69.	Lighting would be designed to minimise spill into surrounding areas as far as practical to avoid impacts upon native fauna
70.	Where tree trimming is required: • pruning would not exceed 10 percent of the overall canopy volume • no limbs greater than 150 millimetres in diameter are to be removed • the final pruning cut should be at the branch collar in accordance with AS4373-2007 • all tree pruning work is to be carried out by an arborist with a minimum AQF Level 3 qualification in Arboriculture, in accordance with Australian Standard AS4373-2007, Pruning of Amenity Trees, and the NSW WorkCover *Code of Practice for the Amenity Tree Industry* (1998).
71.	Where the loss of trees is unable to be mitigated, Transport for NSW would replace trees removed as a result of the project in accordance with the Transport for NSW's *Vegetation Offset Guide* (2019l).
72.	Platform resurfacing would not encroach into the area of the existing planter boxes associated with trees 22, 23, 24 and 28 (as referenced in the *Arboricultural Impact Assessment* report by Tree Survey, 2021)
	Soils and water
73.	Prior to commencement of work, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of work and maintained throughout construction.

No.	Mitigation measure
74.	Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the work is complete and areas are stabilised.
75.	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.
76.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and Transport for NSW's *Chemical Storage and Spill Response Guidelines* (TfNSW, 2015d).
77.	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 *Chemical Storage and Spill Response Guidelines* (TfNSW, 2015d) 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.
78.	In the event of a pollution incident, work would cease in the immediate vicinity and the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Senior Environment and Sustainability Officer or Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the POEO Act.
79.	The existing drainage systems would remain operational throughout the construction phase.
80.	Should groundwater be encountered during excavation work, groundwater would be managed in accordance with the requirements of the Waste Classification Guidelines (EPA, 2014) and the TfNSW *Water Discharge and Reuse Guideline* (TfNSW, 2019i).
	Air quality
81.	Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's *Air Quality Management Guideline* (TfNSW, 2015h).
82.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
83.	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.
84.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
85.	To minimise the generation of dust from construction activities, the following measures would be implemented: • apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) • cover stockpiles when not in use • appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading • prevent mud and dirt being tracked onto sealed road surfaces.

No.	Mitigation measure
	Waste and contamination
86.	The CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum: • identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data.
87.	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.
88.	All excavated spoil suitable for reuse would be reused on site and distributed as agreed with Transport for NSW and the Contractor. The reuse of excavated material would be further reviewed and confirmed during construction.
89.	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.
90.	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal.
91.	Any concrete washout would be established and maintained in accordance with Transport for NSW's *Concrete Washout Guideline* – draft (TfNSW, 2019k) with details included in the CEMP and location marked on the ECM.
	Sustainability, climate change and greenhouse gases
92.	Detailed design and construction of the Proposal is to be undertaken in accordance with the ISC Infrastructure Sustainability Rating Scheme (v1.2).
93.	The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (Transport for NSW, 2017) or other approved modelling tools. The carbon footprint would to be used to inform decision making in design and construction.
94.	The detailed design process would undertake a climate change impact assessment with reference to the *Transport Climate Change Risk Assessment Guidelines* (Department of the Environment and Heritage, 2006) and the *IS Council Guidelines for Climate Change Adaptation* (AGIC, 2011) to determine the hazards/risks associated with future climatic conditions. Issues including protecting customers and electrical equipment from wind and rain during storm events, size of guttering, cross flow ventilation, reflective surfaces etc. would be considered in the design.
	Cumulative impacts
95.	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 interchange and access facilities for all customers utilising Denistone Station.

The likely key impacts of the Proposal are as follows:

- temporary adverse impacts to the visual amenity of the local environment due to the construction works associated with the Proposal
- temporary impacts on local traffic flow associated with construction traffic along Gordon Crescent
- temporary disruptions to station facilities and amenities during construction, including potential weekend closures of Denistone Station during scheduled Sydney Trains rail shutdowns
- temporary changes to vehicular, bus and pedestrian access around the station during construction
- temporary loss of up to around 10 car parks in the Council car park north-west of Kinson Crescent to accommodate a construction laydown area
- temporary noise impacts to adjacent residential areas during construction, including periods of weekend works
- potential sediment mobilisation, dust generation and erosion risk during construction.
- impacts to the heritage fabric as a result of the construction of the Proposal including impacts to the footbridge, booking office and station platform buildings
- minor changes to the overall built form of the station during operation, noting most of these changes are expected to result in minor beneficial visual impacts during operation
- minor impacts to the existing station building and visual environment from the introduction of new elements, such as the new lifts.

This REF has considered and assessed these impacts in accordance with clause 228 of the EP&A Regulation and the requirements of the EPBC Act (refer to Chapter 6, Appendix A and Appendix B). Based on the assessment contained in this REF, it is considered that the Proposal is not likely to have a significant impact upon the environment or any threatened species, populations or communities. Accordingly, an EIS is not required, nor is the approval of the Minister for Planning and Public Spaces.

The Proposal would also take into account the principles of ESD and sustainability (refer to Section 3.3.3 and Section 4.3). These would be considered during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

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Appendix A Consideration of matters of National Environmental Significance

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

Matters of NES	Impacts
Any impact on a World Heritage property? 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 would be impacted.	Nil
Any impacts on listed migratory species? No listed migratory species are likely to utilise the habitat within the study area.	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 not related 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 (a new lifts, canopies, and minor adjustments/relocation of existing infrastructure). The appearance of the new elements would be consistent with the existing station elements and are considered to be common features in urban areas. The Proposal would have a positive contribution to the locality by creating accessible entrances to the station and station platforms.	Minor
(c) Any environmental impact on the ecosystem of the locality? The Proposal would not require vegetation removal.	Nil
(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. 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? The Proposal would have the following direct and visual impacts on the following components of the Denistone Station Group: • Overbridge – Neutral direct impact and a minor visual impact • Overhead booking office – Negligible direct impact and moderate visual impact Footbridge – Moderate direct impact and moderate visual impact • Station building on Platform 1/2 – Moderate direct impact and moderate visual impact • Station building on Platform 3/4 – Moderate direct impact and minor visual impact • Platforms – Negligible direct and visual impact • Retaining walls, signal box and communications box – Neutral direct and visual impact. Denistone Railway Station Group is listed on the TAHE Section 170 Heritage and Conservation Register. The Proposal would retain the overall heritage values of the existing station and would have an overall moderate impact. Further information is available in *Statement of Heritage Impact* (SoHI) prepared by Artefact Heritage (2021)	Moderate

Factor	Impacts
(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 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
(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? Construction of the Proposal could result in pollution of the environment (e.g. noise and dust emissions), however provided the recommended management and mitigation measures are implemented, this risk is expected to be minor.	Minor
(m) Any environmental problems associated with the disposal of waste? The Proposal is unlikely to cause any environmental problems associated with the disposal of waste. Given the historical use of the station as a rail corridor, there is potential for contaminants to be present within the soils underlying the station. Historic activities associated with rail corridors that have the potential to result in contamination include the introduction of fill materials including ash, fuel or oil spills and accidental leaks or spills from maintenance and operational activities. Given the age of the station building, there is also potential for asbestos materials and lead paint to be encountered. Hazardous waste (including asbestos, if found) may be generated by the Proposal. Contamination identification would occur prior to construction to confirm the presence of hazardous materials. All waste would be managed and disposed of with a site-specific 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

Factor	Impacts
(o) Any cumulative environmental effect with other existing or likely future activities? Cumulative effects of the Proposal are described in Section 6.16. Where feasible, environmental management measures would be co-ordinated to reduce any cumulative construction impacts. The Proposal is unlikely to have any significant adverse long-term impacts.	Minor
(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