NSW GOVERNMENT

Transport Access Program

Edgecliff Station Upgrade

Review of Environmental Factors

November 2017

Edgecliff Station Upgrade Review of Environmental Factors

Transport Access Program
Ref–5,659,178

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
ASA	Asset Standards Authority (refer to Definitions)
ASS	Acid Sulfate Soils
BCA	Building Code of Australia
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
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
D&C	Design & Construct
DDA	*Disability Discrimination Act 1992* (Cwlth)
DoE	Commonwealth Department of the Environment
DP&E	NSW Department of Planning and Environment
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
DSI	Detailed Site Investigation (Phase II Contamination Investigation)
ECM	Environmental Controls Map
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000* (NSW)

Term	Meaning
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)
GAC booth	Gate Array Controller
Heritage Act	*Heritage Act 1977* (NSW)
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2000).
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
LV	Low Voltage
NES	National Environmental Significance
Noxious Weeds Act	*Noxious Weeds Act 1993* (NSW)
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	NSW Office of the Environment and Heritage
OOHW	Out of hours works
PA system	Public Address system
PDP	Public Domain Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
RailCorp	(former) Rail Corporation of NSW
RAP	Remediation Action Plan
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)

Term	Meaning
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
TCP	Traffic Control Plan
TfNSW	Transport for NSW
TGSI	Tactile Ground Surface Indicators (“tactiles”)
TMP	Traffic Management Plan
TPZ	Tree Protection Zone
TSC Act	*Threatened Species Conservation Act 1995* (NSW)
TVM	Ticket Vending Machine
UDP	Urban Design Plan
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)

Definitions

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

Term	Meaning
NSW 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 TfNSW.
Out of hours works	Defined as works *outside* standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Part 5 of the EP&A Act - in this instance, TfNSW.
Rail possession	Possession 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.
Tactiles	Tactile tiles or Tactile Ground Surface Indicators (TGSIs) are textured ground surface indicators to assist pedestrians who are blind or visually impaired. They are found on many footpaths, stairs and train station platforms.
The Proposal	The construction and operation of the Edgecliff Station Upgrade.
Vegetation Offset Guide	The TfNSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 111 of the EP&A Act. The Guide provides for planting of a minimum of eight trees for each large tree with a diameter at breast height (DBH) of more than 60 cm, four trees where the DBH is 15-60 cm, or two trees where DBH is less than 15 cm.

Executive summary

Overview

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

The Proposal is part of the Transport Access Program which is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

This Review of Environmental Factors (REF) has been prepared to assess the environmental impacts associated with the construction and operation of the Proposal under the provisions of Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Description of the Proposal

The key features of the Proposal are summarised as follows:

- installation of a new lift (Lift 1) inside the paid station concourse area to provide access between the paid station concourse and the station platform
- installation of a new lift (Lift 2) outside the paid station concourse area to provide access between the station concourse, gallery level retail and the bus interchange
- replacement of the existing four escalators that provide access between the paid station concourse and station platform with new escalators
- provision of new fire stairs to provide emergency egress between the paid station concourse and the station platform
- relocation of the existing ticket gate line and the addition of approximately four gates to increase circulation space in the paid station concourse
- partial demolition of the existing platform buildings to improve pedestrian movement
- installation of new pedestrian crossings and pram ramps at the bus interchange to provide a DDA compliant accessible path of travel from the new lift to the existing bus stands
- installation of additional wind breaks on the bus islands
- relocation of the existing bicycle shed at the bus interchange
- provision of three new kiss and ride spaces on New McLean Street, sheltered seating and installation of a new undercover bicycle rack
- modification of the existing pedestrian access ramp on New McLean Street to provide a DDA accessible path of travel from the station concourse to the new kiss and ride
- ancillary works including improvements to lighting, electrical upgrades, minor drainage works, new seating, improvement to station communications systems (including CCTV cameras), hearing loops, wayfinding signage and installation of Tactile Ground Surface Indicators (TGSIs).

Subject to approval, construction is expected to commence in mid 2018 and take around 12 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF.

Need for the Proposal

Improving transport customer experience is the focus of the NSW Government transport initiatives. Transport interchanges, train stations and commuter car parks are important gateways to the transport system and play a critical role in shaping the customer experience and perception of public transport.

The upgrades are 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 would support growth in commercial and residential development.

The Proposal fulfils the Transport Access Program objectives by proposing to provide:

- a station that is accessible to all, including those with a disability, the ageing, parents/carers with prams and customers with luggage
- improved customer experience (weather protection and better interchange facilities)
- minimised pedestrian conflict and crowding points
- improved integration with the surrounding precinct
- improved customer safety
- improved wayfinding in and around the station
- minimal impacts to heritage features of the station and the inclusion of heritage interpretation
- improved customer amenity
- improved pedestrian links between the station, bus interchange and New McLean Street by providing an accessible path of travel.

The Proposal is also consistent with NSW planning strategies, including *NSW: Making It Happen* (NSW Government, 2015) and the *NSW Long Term Transport Master Plan* (TfNSW, 2012a).

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

Design options considered

Options for improving access at Edgecliff Station were developed following a succession of workshops with TfNSW, relevant stakeholders (including Sydney Trains) and the Proposal design team.

Three concept design options were initially developed to address accessibility and customer experience needs and other design principles, while a fourth option was added at a later stage during the process.

Improvements common to all options included the installation of two new lifts, relocation of the existing ticket gates, upgrades to the existing pedestrian access from New McLean Street,

new kiss and ride spaces, additional bicycle parking facilities, and ancillary facilities such as CCTV adjustments and improvements to wayfinding signage.

The key differences focused on alternate lift locations and upgrades to the existing escalators and bus interchange, and are summarised as follows:

- Option 1 proposed the provision of two lifts including one within the paid station concourse to provide access to the station platform and one at New McLean Street to provide access to the station concourse and bus interchange. The existing escalators providing access to the station platform would remain in their current location.
- Option 2 proposed the provision of two lifts including one within the paid concourse station concourse to provide access to the station platform and one outside the paid station concourse to provide access between the station concourse and bus interchange. The existing escalators providing access to the station platform would remain in their current location.
- Option 3 proposed the provision of two lifts in the same location as Option 2 and the relocation of the eastern set of escalators approximately 2 metres east providing access to the station platform.
- Option 3b was later developed as a derivative of Option 3. The key design features of Option 3 were retained however the scope was increased to include replacement and relocation of all four escalators providing access to the station platform, revised design of the ticket barrier relocation, installation of fire stairs between the paid station concourse and platform, and upgrades to the bus interchange design including pedestrian crossings, pram ramps, wind breaks and extension of the existing canopy.

  Option 3b is the preferred option, the Proposal, and the subject of this REF.

Statutory considerations

The EP&A Act provides for the environmental impact assessment of development in NSW. Part 5 of the EP&A Act generally specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as TfNSW, which do not require development consent under the EP&A Act.

The *State Environmental Planning Policy (Infrastructure) 2007* (the Infrastructure SEPP) is the primary environmental planning instrument relevant to the proposed development and is the key environmental planning instrument which determines the permissibility of the Proposal under the EP&A Act.

Clause 79 of the Infrastructure SEPP allows for the development of 'rail infrastructure facilities' by or on behalf of a public authority without consent on any land. Clause 78 defines 'rail infrastructure facilities' as including elements such as '*railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms'*, '*public amenities for commuters*' and '*associated public transport facilities for railway stations'*.

As TfNSW is a public authority and the proposed activity falls within the definition of rail infrastructure facilities under the Infrastructure SEPP, the Proposal is permissible without development consent. Consequently the environmental impacts of the Proposal have been assessed by TfNSW under Part 5 of the EP&A Act.

This REF has been prepared to assess the construction and operational environmental impacts of the Proposal. The REF has been prepared in accordance with clause 228 of the *Environment Planning and Assessment Regulation 2000* (the EP&A Regulation).

In accordance with section 111 of the EP&A Act, TfNSW, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

Chapter 6 of this REF presents the environmental impact assessment for Edgecliff Station Upgrade, in accordance with these requirements.

Community and stakeholder consultation

Under the Infrastructure SEPP, consultation is required with local councils or public authorities in certain circumstances, including where Council-managed infrastructure is affected. Consultation has been undertaken with Woollahra Municipal Council and Roads and Maritime Services 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.

Initial community consultation was undertaken in May and June 2017 to invite feedback on the preliminary design. This included distribution of flyers to customers and the community and pop up information sessions at the station. Feedback received from this consultation was used to refine the design and inform the preparation of this REF.

TfNSW is also proposing to undertake the following consultation for the Proposal:

- direct notification to community stakeholders to invite feedback on the Proposal
- public display of the REF
- door knocking local businesses
- pop up information stalls at the station to allow customers and community members to speak with the project team
- installation of posters at the station and interchange
- flyer distribution at local events to allow community members to speak with the project team and provide immediate feedback on the Proposal
- distribution of flyers within approximately 300 metres radius of the station to the suburbs of Edgecliff, Paddington and Rushcutters Bay.

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

During this period, the REF would be available for viewing at the following locations:

- Woollahra Municipal Council Office, 536 New South Head Road, Double Bay
- Woollahra Library, Level 1, 451 New South Head Road, Double Bay
- Transport for NSW Office, Level 5, Tower A, Zenith Centre, 821 Pacific Highway, Chatswood.

The REF would also be available to download from the TfNSW website[1] and a Project Infoline (1800 684 490) would be available for members of the public to make enquiries.

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

Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure 1 presents an overview of the consultation and planning process and the current status of the Proposal.

[1] http://www.transport.nsw.gov.au/projects-tap

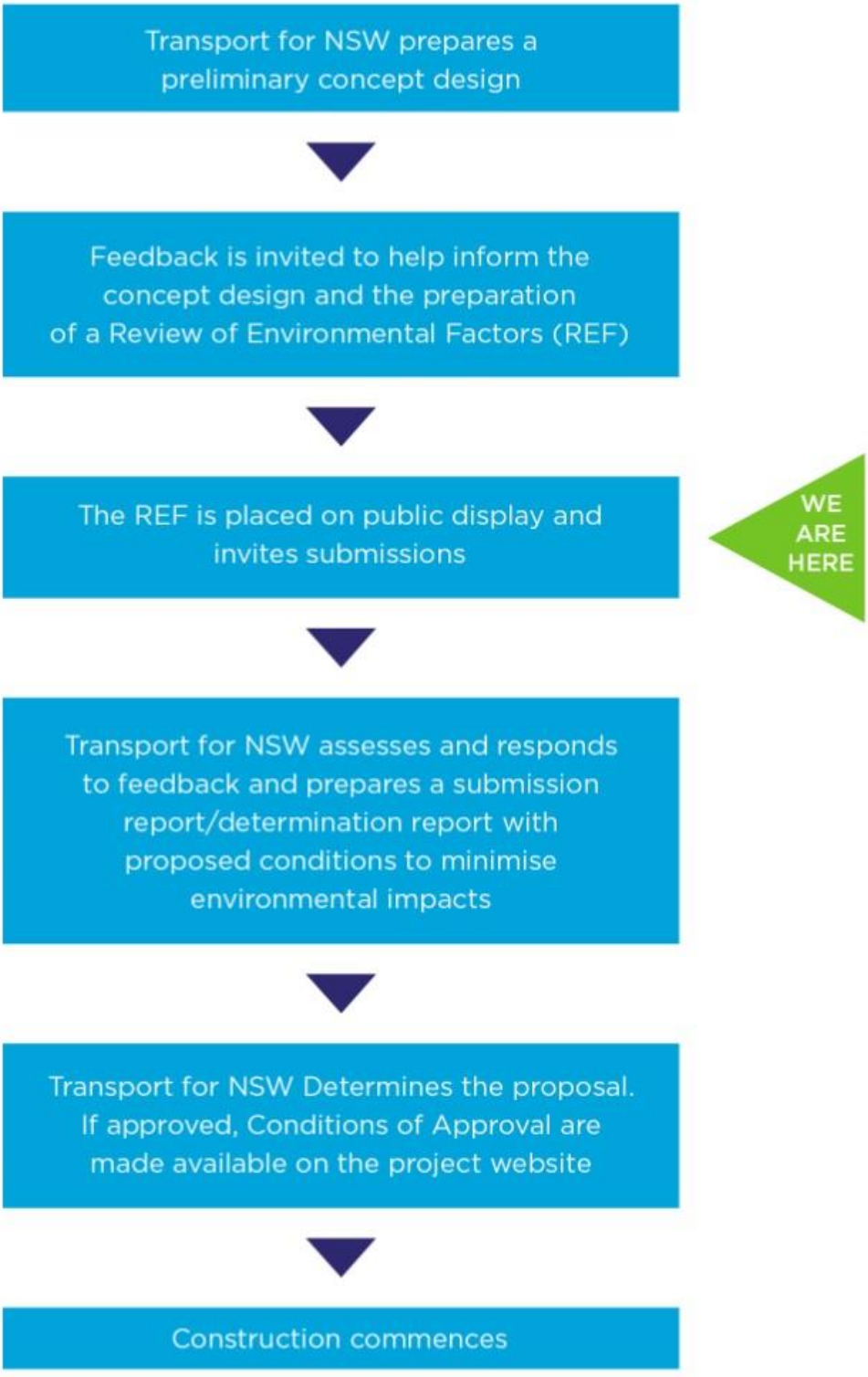

Figure 1 Planning approval and consultation process for the Proposal

Environmental impact assessment

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

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

- temporary noise and vibration impacts during construction
- temporary traffic impacts during construction
- removal of vegetation and subsequent application of planting offsets
- impacts to station heritage fabric from the installation of new lifts, escalators and fire stairs, and the relocation of the ticket gates
- permanent changes to parking arrangements on New McLean Street including the conversion of approximately five on-street timed parking spaces to three kiss and ride spaces.

The longer term benefits of the Proposal include improved accessibility to the station and improved station and interchange facilities.

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

Conclusion

This REF has been prepared having regard to sections 111 and 112 of the EP&A Act, and clause 228 of the EP&A Regulation, to ensure that TfNSW takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The detailed design of the Proposal would also be designed in accordance with the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2017b) 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.

1 Introduction

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

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

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

Edgecliff Station and interchange areas do not currently meet key requirements of the Disability Standards for Accessible Public Transport (DSAPT) or the Commonwealth *Disability Discrimination Act 1992* (DDA).

Escalators currently provide the only means of access to the station platform from the existing station concourse and stairs provide the only means of access to the bus interchange. These do not provide an accessible path of travel for the elderly, people with reduced mobility, parents/carers with prams or customers with luggage. In addition, there is currently no kiss and ride facilities for customers using the station.

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

The expected increase in patronage has been taken into consideration during the design development. The Bureau of Transport Statistics (BTS) 2014 station barrier counts indicated a daily patronage of 14,100 trips, which is expected to increase to 17,190 by 2036. The Proposal has been designed to cater for a daily patronage of 17,768 (which is the daily patronage plus an increase of 15 per cent).

1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- installation of a new lift (Lift 1) inside the paid station concourse area to provide access between the paid station concourse and the station platform
- installation of a new lift (Lift 2) outside the paid station concourse area to provide access between the station concourse and the bus interchange
- replacement of the existing four escalators that provide access between the paid station concourse and station platform with new escalators
- provision of new fire stairs to provide emergency egress between the paid station concourse and the station platform
- relocation of the existing ticket gate line and the addition of approximately 4 gates to increase circulation space in the paid station concourse
- partial demolition of the existing platform buildings to provide pedestrian passing bays

- installation of new pedestrian crossings and pram ramps at the bus interchange to provide a DDA compliant accessible path of travel from the new lift to the existing bus stands
- installation of additional wind breaks on the bus islands
- relocation of the existing bicycle shed at the bus interchange
- provision of three new kiss and ride spaces on New McLean Street, sheltered seating and installation of a new undercover bicycle rack
- modification of the pedestrian access ramp on New McLean Street to provide an accessible path of travel from the station concourse to the new interchange facilities
- ancillary works including adjustments to lighting, electrical upgrades, minor drainage works, new seating, improvement to station communications systems (including CCTV cameras), hearing loops, wayfinding signage and installation of TGSIs.

Subject to planning approval, construction is expected to commence in mid 2018 and take around 12 months to complete.

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

1.2 Location of the Proposal

The Proposal would involve upgrade works to Edgecliff Station, the bus interchange and surrounding streets and footpaths. The station is located four kilometres east of the Sydney Central Business District (CBD) in the suburb of Edgecliff. The location of the Proposal in the regional context is shown in Figure 2.

Edgecliff is located in the Woollahra Municipal Local Government Area (LGA). The suburb is bounded by Woollahra to the south, Paddington to the southwest, Rushcutters Bay to the northwest, Double Bay to the east and Darling Point to the north. The area surrounding the station consists of medium to high density residential, commercial, recreational and residential zones.

The station is located beneath the Eastpoint Food Fair and Edgecliff Centre, providing retail, business and community services. The Proposal would involve works to Edgecliff Station and the bus interchange which is located on land owned by RailCorp, and operated and maintained by Sydney Trains. Works is also proposed on land owned by Woollahra Council and the Edgecliff Centre.

Edgecliff Station consists of a single island platform and is serviced by the T4 Eastern Suburbs and Illawarra Line and is the 35th busiest station on the Sydney Trains network, with around 14,100 trips on an average weekday in 2014.

Refer to Figure 3 for a map of the general locality of the proposed work areas.

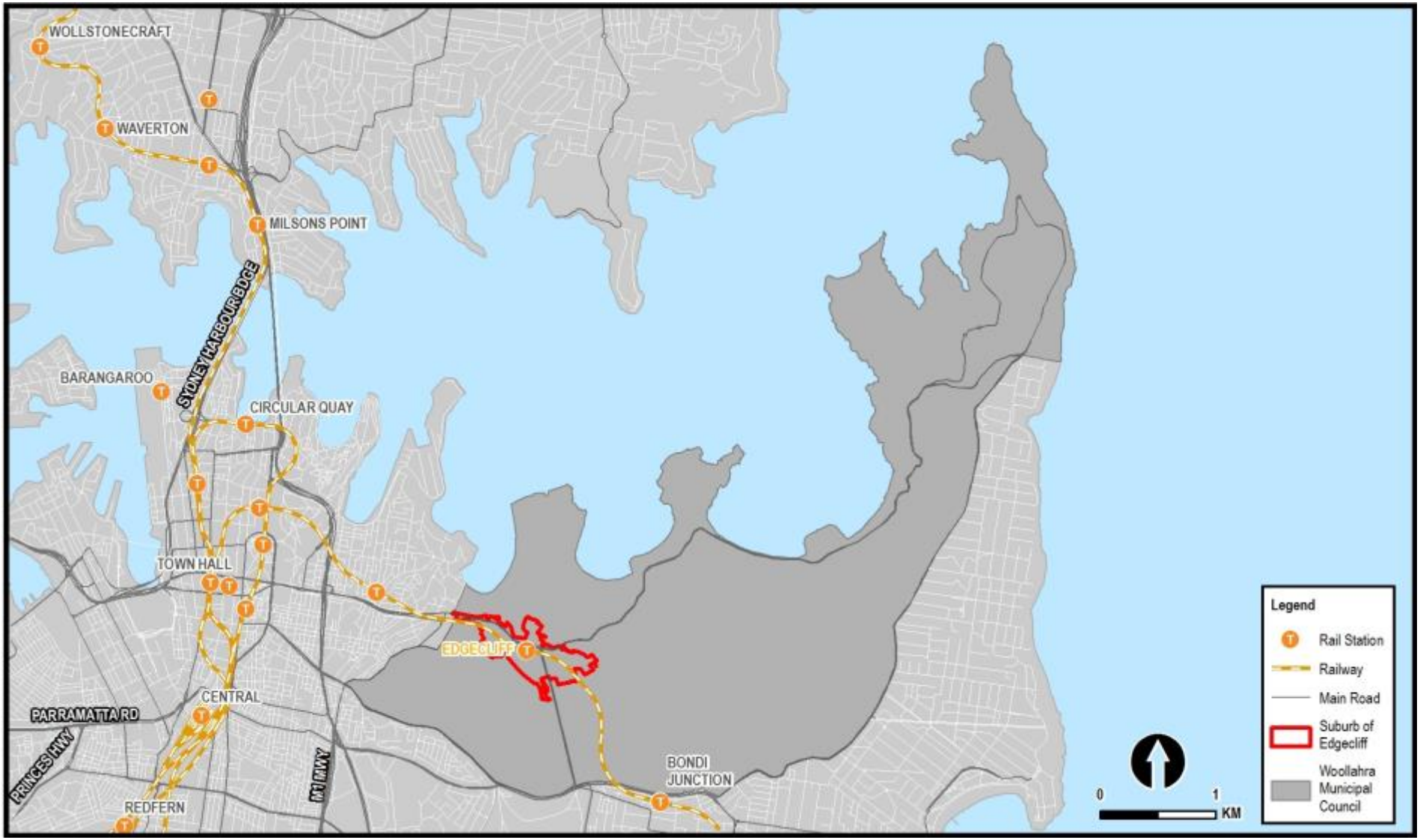

Figure 2 Regional context

1.3 Existing infrastructure and land uses

Under the *Woollahra Local Environmental Plan 2014* (Woollahra LEP), the Edgecliff Centre and Eastpoint Food Fair are zoned B2 Local Centre and the underground rail infrastructure is zoned SP2. A pocket of land zoned public recreation is approximately 20 metres west of the bus interchange and Trumper Park is approximately 100 metres south of the entrance at New McLean Street. Ascham School is approximately 60 metres north of the Proposal on the northern side of New South Head Road.

The station is located underground, beneath the Eastpoint Food Fair and Edgecliff Centre, and runs in parallel with New South Head Road. A paid concourse level, with entrances from New South Head Road and New McLean Street, provides access to two sets of escalators which provides a link to the platform level. The entry from New South Head Road to the concourse is DSAPT compliant, current entry from New McLean street is non-compliant. Edgecliff Station consists of one island platform, with two platforms that are serviced by the T4 Eastern Suburbs and Illawarra Line. Platform 1 is located on the southern side of the platform providing services to Waterfall or Cronulla via the City. Platform 2 is located on the northern side of the platform providing services to Bondi Junction.

A gallery level is located directly above the concourse level and contains shops associated with Eastpoint Food Fair and the Edgecliff Centre. Current access from the concourse level to the gallery level is via stairs (non-DSAPT compliant).

A bus interchange is located at roof level which is accessed via stairs from the gallery level and escalators and stairs between the gallery and the concourse level. A bike locker is located at the bus interchange. Existing bike racks are on New South Head Road and New McLean Street.

A cross section showing the station in relation to the gallery and bus interchange is provided in Figure 4. Sensitive receivers in the vicinity of Edgecliff Station include:

- a number of tenants/owners of commercial and retail spaces associated with the neighbourhood town centre located on New South Head Road west of the junction with Ocean Street, and on Ocean Street south of the junction with New South Head Road
- commercial and retail shops within the Edgecliff Centre and Eastpoint Food Fair
- residents of multi-unit dwellings on New McLean Street, including odd numbers 27-35
- residents of semi-detached dwellings on Arthur Street, consisting of numbers 2, 4, 8, 14 and 18
- residents and small-business operators on north side of New South Head Road, including even numbers 136 – 216.

Photographs of the existing station and surrounds are provided in Figure 5, Figure 6, Figure 7 and Figure 8.

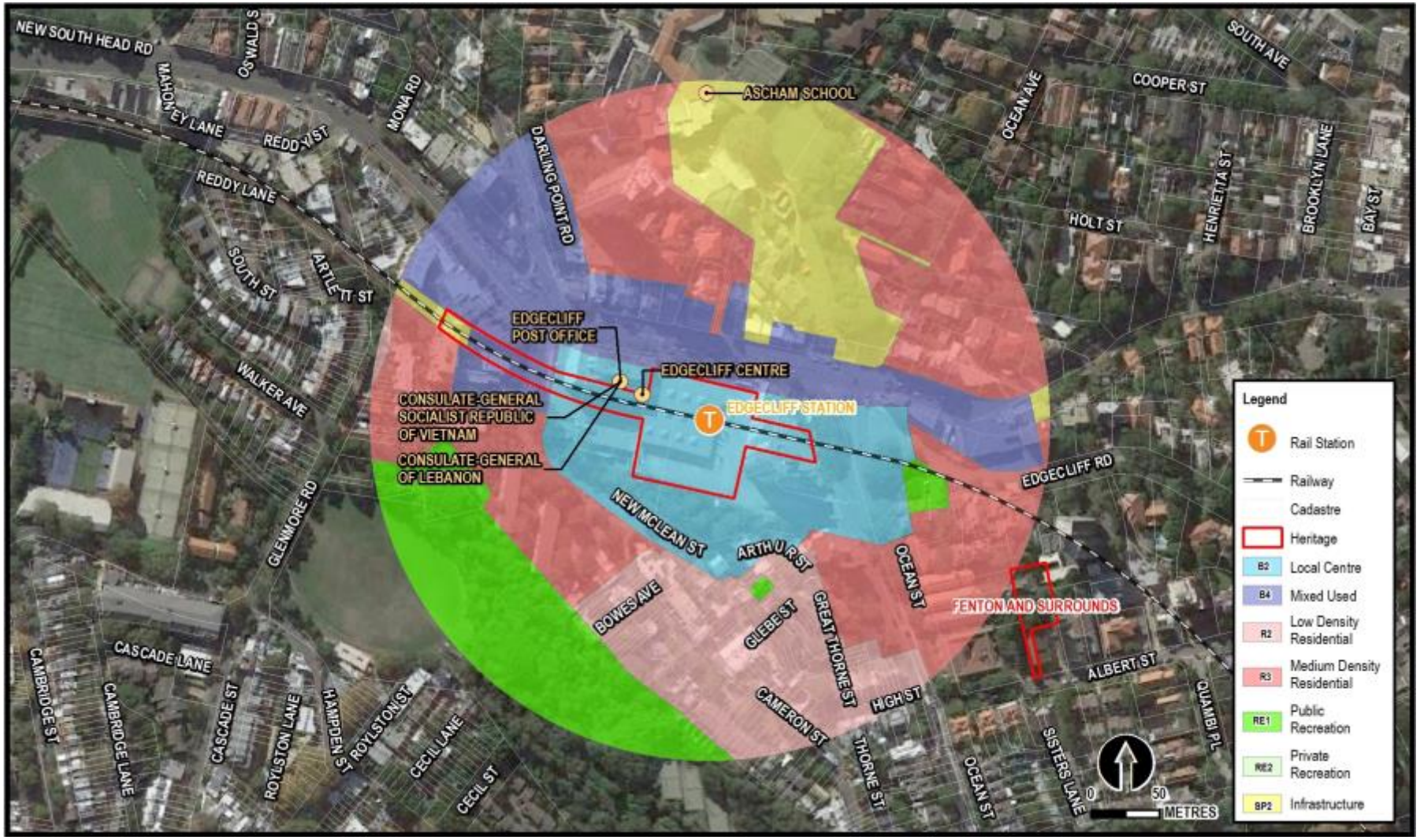

Figure 3 Site locality map

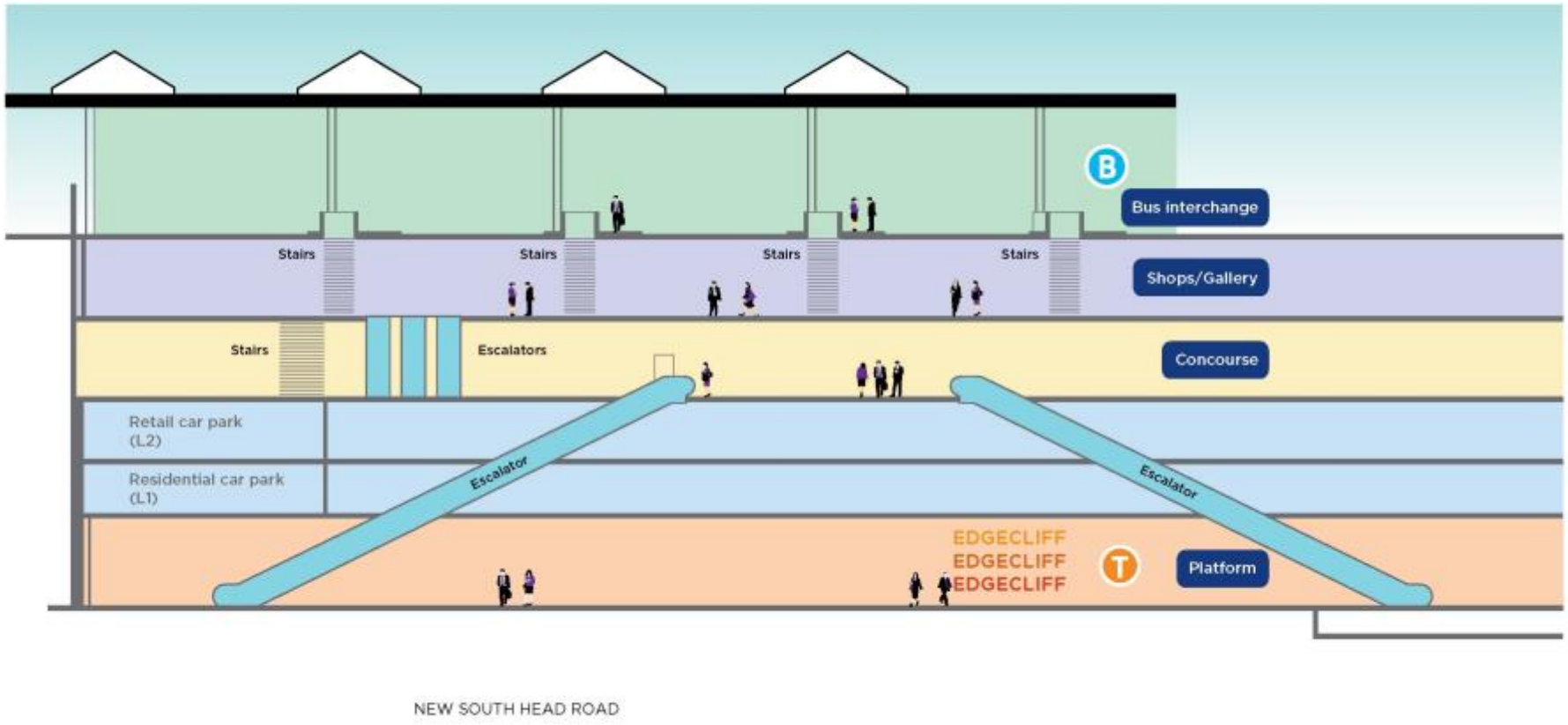

Figure 4 Layout of Edgecliff Station transport interchange including Eastpoint Food Fair

Figure 5 View towards Edgecliff Station entrance from New South Head Road

Figure 6 View towards Edgecliff Station entrance (via existing non-compliant pedestrian ramp) from New McLean Street

Figure 7 View towards the ticket gates and paid station concourse (concourse level)

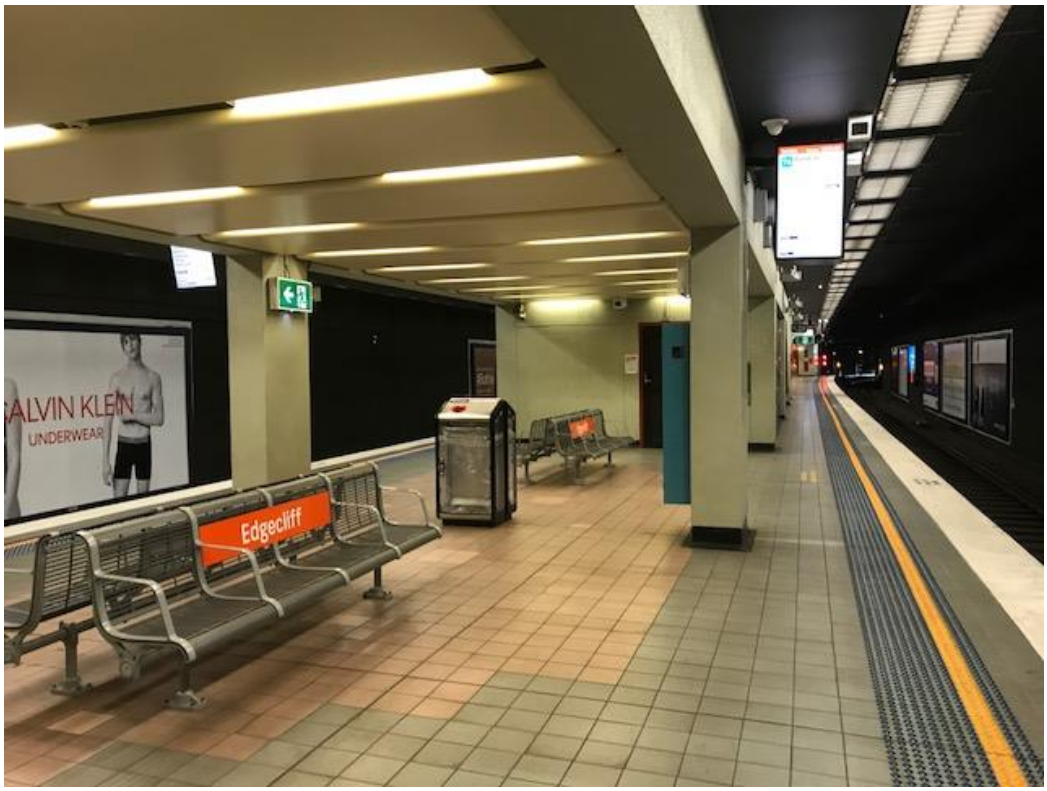

Figure 8 View towards the station platform (platform level)

Figure 9 View towards the bus interchange (bus interchange level) (Edgecliff Centre shown beyond)

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by TfNSW to assess the potential impacts of the Edgecliff Station Upgrade. For the purposes of these works, TfNSW is the proponent and the determining authority under Part 5 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 111 of the EP&A Act, and to identify mitigation measures to reduce the likely impacts of. This REF has been prepared in accordance with clause 228 of the *Environment Planning and Assessment Regulation 2000* (the EP&A Regulation).

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

Having regard to the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), this REF considers the potential for the Proposal to have a significant impact on matters of National Environmental Significance (NES) or Commonwealth land, and the need to make a referral to the Commonwealth Department of Environment for any necessary approvals under the EPBC Act. Refer to Chapter 4 for more information on statutory considerations.

2 Need for the Proposal

Chapter 2 discusses the need and objectives of the Proposal, 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

2.1.1 Overview

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

Edgecliff 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.

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

One of the 12 priorities identified as part of *NSW: Making It Happen* relates to investment in building infrastructure. The ongoing development and investment in transport infrastructure is identified as part of the wider building infrastructure priority.

The Proposal assists in meeting the priority by improving accessibility to public transport and encouraging greater use of public transport.

The NSW Government has developed a *Long Term Transport Master Plan* (TfNSW, 2012a). This plan provides a comprehensive strategy for all modes of transport across NSW over the next 20 years, while also delivering on current commitments.

Data forecasts indicate that there would be significant growth in population and employment from 2006 up to 2036 in the area within the station catchment. The Proposal accommodates the forecast Sydney Trains patronage growth and changing travel patterns (BTS, 2014).

The *Disability Action Plan 2012-2017* (TfNSW, 2012b) was developed by TfNSW, in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing representative organisations within NSW. The Plan discusses the challenges, the achievements to date, the considerable undertaking that is required to finish the job and provide a solid and practical foundation for future progress over the next five years. The Proposal has been developed in consideration of the objectives outlined in this Plan.

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

2.1.2 Objectives of the Transport Access Program

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

2.1.3 Objectives of the Proposal

The specific objectives of the Edgecliff Station Upgrade are to:

- provide a station that is accessible to all, including those with a disability, the ageing, parents/carers with prams and customers with luggage
- improve customer experience (weather protection and better interchange facilities)
- minimise pedestrian conflict and crowding points
- improve integration with the surrounding precinct
- improve customer safety
- improve wayfinding in and around the station
- minimise impacts to heritage features of the station and incorporate heritage interpretation
- improve customer amenity
- improve pedestrian links between the station, bus interchange and New McLean Street by providing an accessible path of travel.

2.2 Design development

TfNSW commissioned the development of a concept design for the Edgecliff Station Upgrade that would improve accessibility in and around the station and meet key architectural, engineering and urban design objectives. The design developed has accommodated the forecast Sydney Trains patronage growth (which is the estimated daily customer patronage in 2036 plus an increase of 15 per cent) (BTS, 2014).

The development of the concept design involved several key tasks, including an assessment of existing interchange performance and identification of key deficiencies and opportunities for

improving accessibility and customer experience. The assessment identified the following deficiencies with the existing station and surrounding interchange:

- lack of an accessible path between the station concourse and the platform
- lack of an accessible path between the station and surrounding streets and bus interchange
- lack of tactile ground surface indicators on existing stairs, ramps and bus stops
- no formal kiss and ride facilities at the station resulting in illegal drop-offs
- lack of weather protection at the north bound bus stop on New South Head Road
- no safe crossing for pedestrians between the bus ranks at the bus interchange
- no modal separation between cyclists, buses and private vehicles within the bus interchange
- poor wayfinding signage and CCTV coverage
- insufficient bicycle storage facilities
- need to improve fire egress from the platform.

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

2.3 Alternative options considered

Options for improving access to Edgecliff Station were developed following a succession of workshops with the Stakeholder Working Group. Workshops were attended by representatives from Sydney Trains and TfNSW, including the divisions for Customer Service and Infrastructure and Services. External stakeholder consultations were undertaken with Roads and Maritime Services, Woollahra Council and Sydney Trains Strategic Working Group (SWG).

Three concept design options were initially developed to address accessibility and customer experience needs and other design principles, while a fourth option was added at a later stage during the design process.

Improvements common to all options included the installation of two new lifts, relocation of the existing ticket gates, upgrades to the existing pedestrian access from New McLean Street, new kiss and ride spaces, additional bicycle parking facilities, and ancillary facilities such as CCTV adjustments and improvements to wayfinding signage.

The key differences focused on alternate lift locations and upgrades to the existing escalators and bus interchange, and are summarised as follows:

- Option 1 proposed the provision of two lifts including one within the paid station concourse to provide access to the station platform and one at New McLean Street to provide access to the station concourse and bus interchange. The existing escalators providing access to the station platform would remain in their current location.
- Option 2 proposed the provision of two lifts including one within the paid station concourse to provide access to the station platform and one outside the paid station concourse to provide access between the station concourse and bus interchange. The existing escalators providing access to the station platform would remain in their current location.

- Option 3 proposed the provision of two lifts in the same location as Option 2 and the relocation of the eastern set of escalators approximately 2m east providing access to the station platform.
- Option 3b was later developed as a derivative of Option 3. The key design features of Option 3 were retained however the scope was increased to include replacement and relocation of all four escalators providing access to the station platform, revised design of the ticket barrier location, installation of fire stairs between the paid station concourse and platform, and upgrades to the bus interchange design including pedestrian crossings, pram ramps, wind breaks and extension of the existing canopy.

An option to install a formalised kiss and ride along New South Head Road was not pursued due to safety concerns identified by Road and Maritime Services.

2.3.1 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 and train stations 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 Edgecliff community now or in the future.

2.3.2 Assessment of identified options

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

2.4 Justification for the preferred option

Assessment of the three concept options for the Edgecliff Station Precinct was based on a multi-criteria analysis undertaken with the Stakeholder Working Group. Option 3 was selected as the preferred option based on the outcome of the multi-criteria analysis.

Based on the multi-criteria analysis, Option 3b received the highest non-price score, scoring the highest in customer experience, urban form and land-use integration, modal integration and service operation and engineering constraints.

Other key reasons for Option 3b being chosen as the preferred option include:

- Option 3 achieves a good customer outcome by optimising circulation space between the lift and the escalators in the paid concourse area, minimising walking distance between the two lifts and intuitive wayfinding between station and interchange.
- It achieves optimal accessibility outcomes with new through lifts.
- a majority of the proposed works are kept within the RailCorp properties.

It should be noted that following a workshop with the stakeholder working group Option 3b was modified to take into account feasibility constraints and comments provided by stakeholders.

3 Description of the Proposal

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

3.1 The Proposal

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

The Proposal would include the following key elements:

- installation of a new lift (Lift 1) inside the paid station concourse area to provide access between the paid station concourse and the station platform
- installation of a new lift (Lift 2) outside the paid station concourse area to provide access between the station concourse, the gallery level and the bus interchange
- replacement of the existing four escalators that provide access between the paid station concourse and station platform with new escalators
- provision of new fire stairs to provide emergency egress between the paid station concourse and the station platform
- relocation of the existing ticket gate line and the addition of approximately 4 gates to increase circulation space in the paid station concourse
- partial demolition of the existing platform buildings to improve pedestrian movement
- installation of new pedestrian crossings and pram ramps at the bus interchange to provide a DDA compliant accessible path of travel from the new lift to the existing bus stands
- installation of additional wind breaks on the bus islands
- relocation of the existing bicycle shed at the bus interchange
- provision of three new kiss and ride spaces on New McLean Street, sheltered seating and installation of a new undercover bicycle rack
- modification of the existing pedestrian access ramp on New McLean Street to provide a DDA accessible path of travel from the station concourse to the new kiss and ride
- ancillary works including adjustments to lighting, electrical upgrades, minor drainage works, new seating, improvement to station communications systems (including CCTV cameras), hearing loops, wayfinding signage and installation of TGSIs.

Figure 10, Figure 11, Figure 12, Figure 13 shows the general layout of key elements for the Proposal.

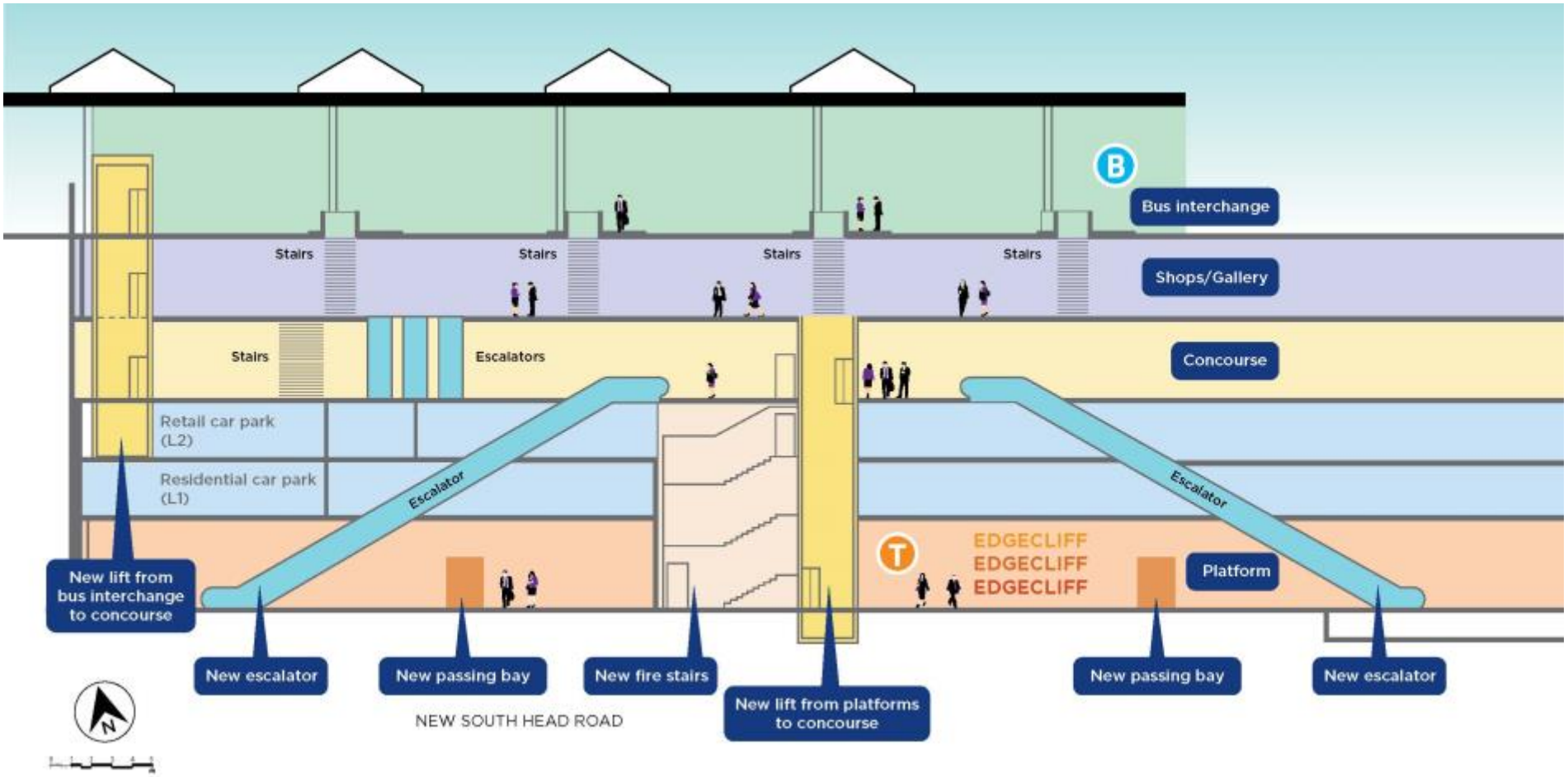

Figure 10 Key elements of the Proposal

(Indicative only, subject to detailed design)

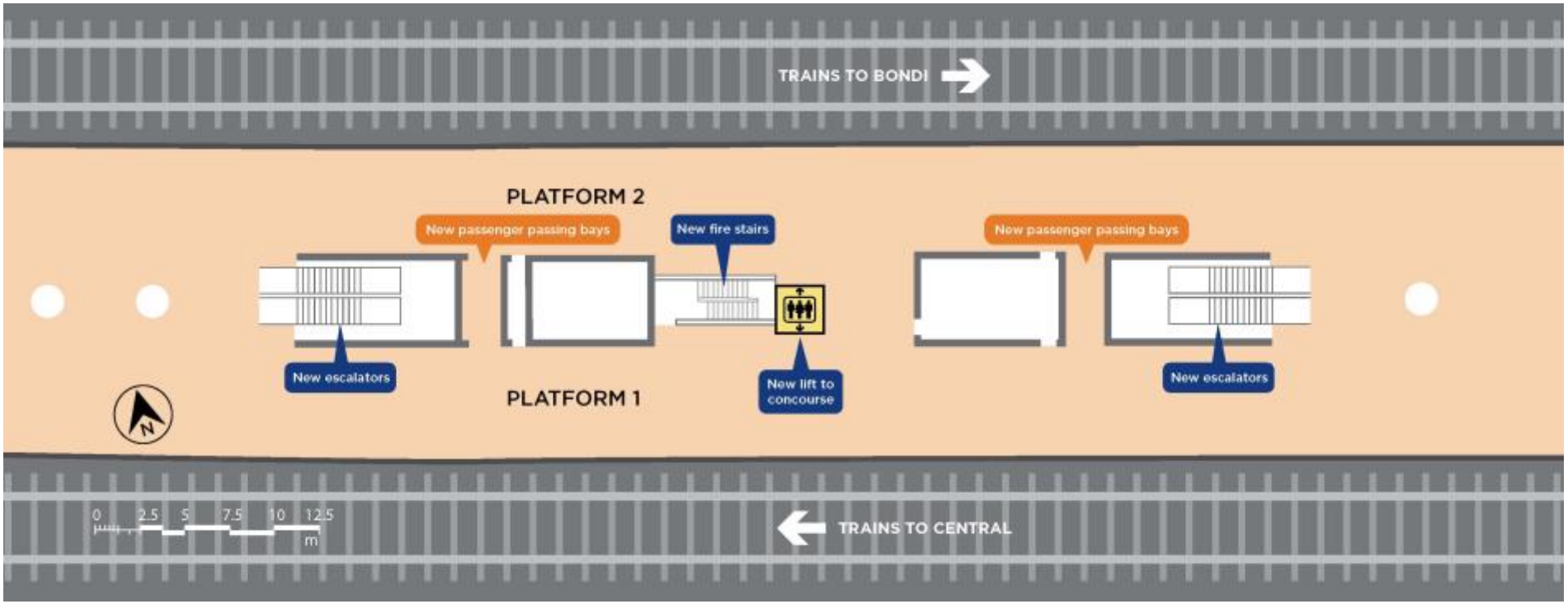

Figure 11 Key elements of the Proposal - Platform

(Indicative only, subject to detailed design)

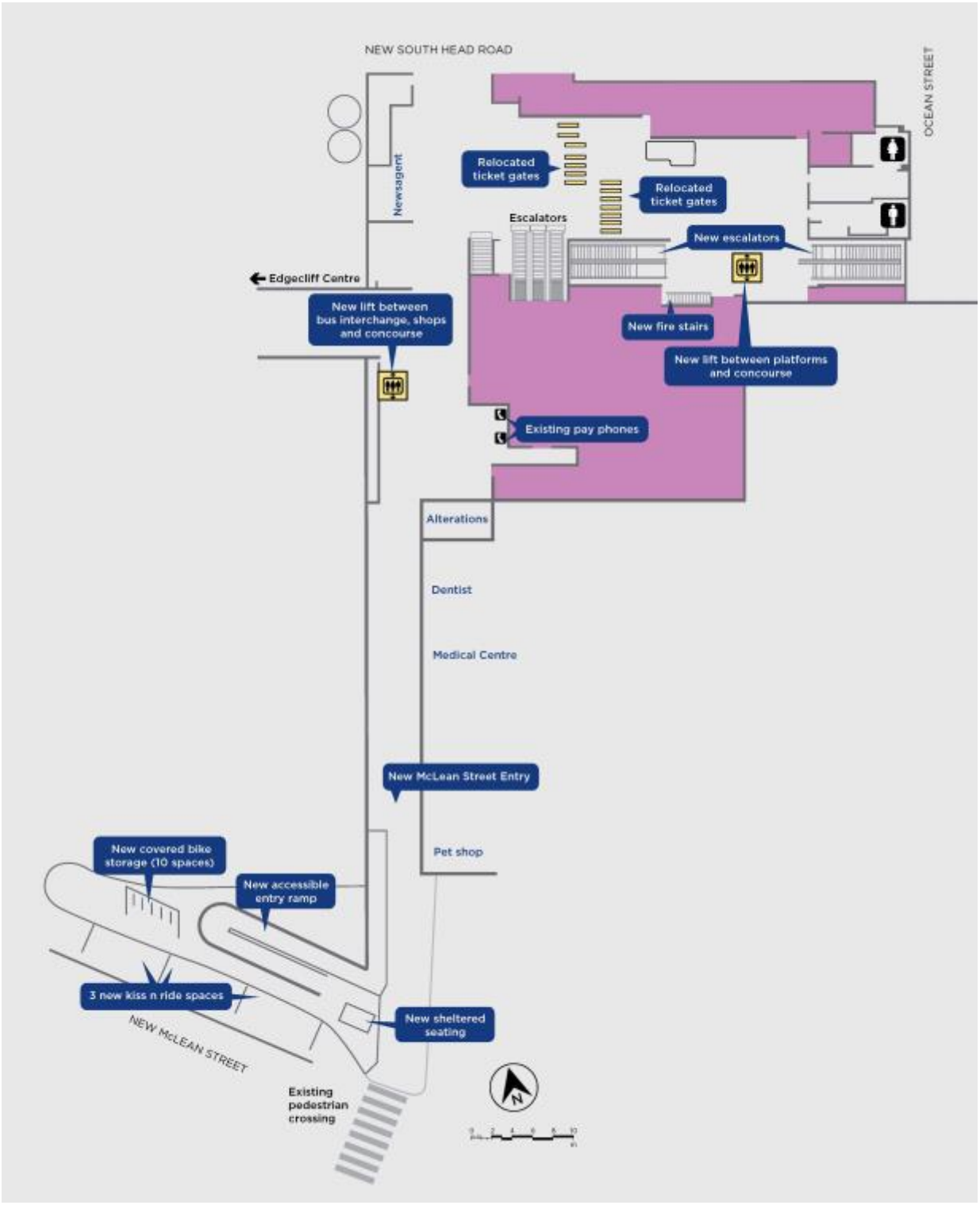

Figure 12 Key elements of the Proposal - Concourse

(Indicative only, subject to detailed design)

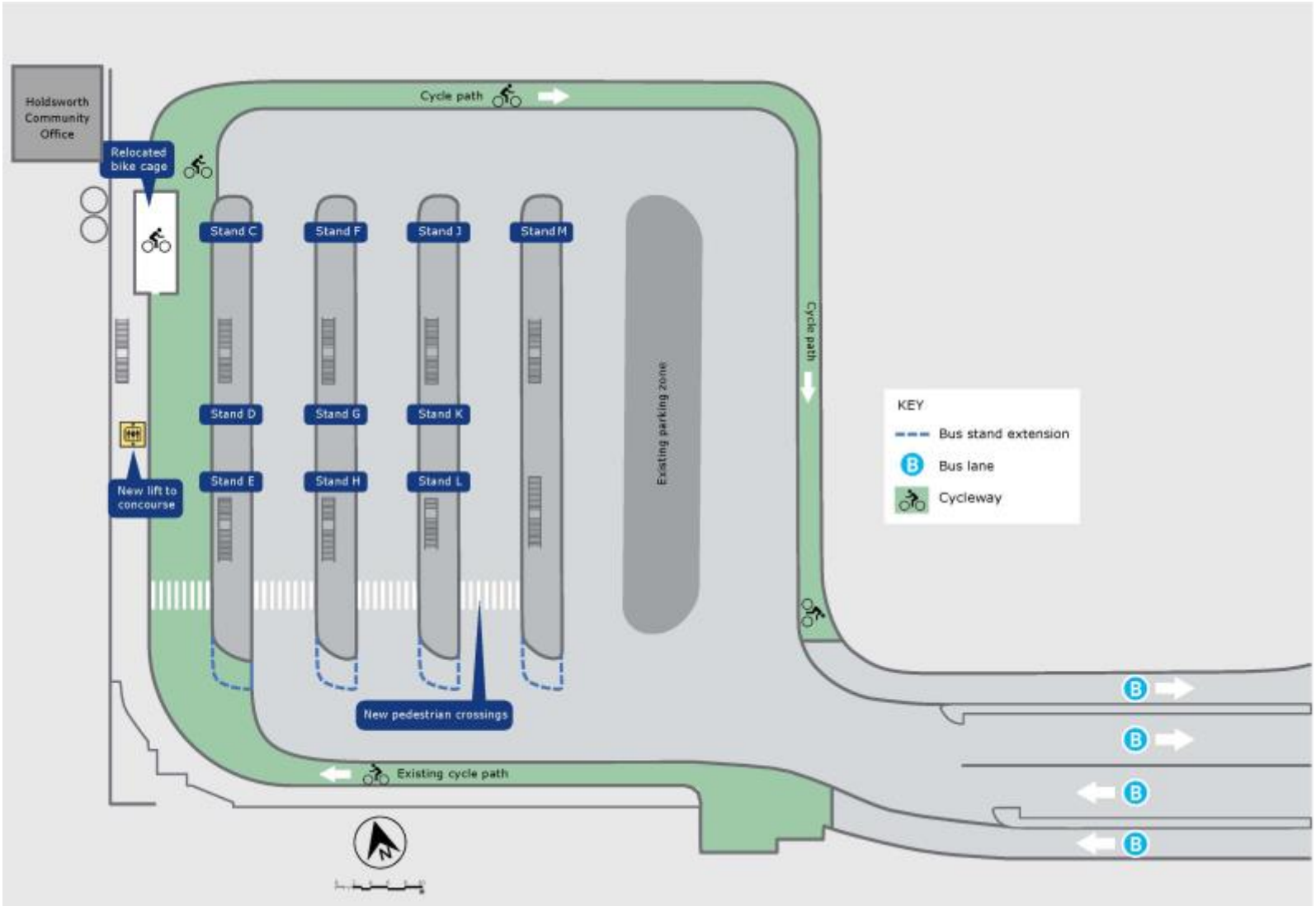

Figure 13 Key elements of the Proposal – Bus Interchange

(Indicative only, subject to detailed design)

3.1.1 Scope of works

Station upgrade

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

- construction and installation of two new lifts which would require penetrations through the existing floor levels within the building and removal of existing plywood ceilings:
    - Lift 1 inside the paid station concourse area to provide access between the paid station concourse and station platform
    - Lift 2 outside the paid station concourse area to provide access between the station concourse and the bus interchange (also stopping at gallery level)
- decommissioning and removal of the existing four escalators in the paid station concourse and associated motors
- construction and installation of four new escalators including associated motors, landings and supporting structures. The escalators would have a shorter landing than previous escalators to allow for improved pedestrian circulation within the paid concourse and would require modifications to the existing plywood ceilings
- construction of new fire stairs and associated supporting structures between the paid station concourse and the station platform
- relocation of existing ticket gates on the concourse, and installation of approximately four additional gates to improve circulation in the paid station concourse
- decommissioning and retention of the existing station staff barrier box (Gate Array Controller booth)
- installation of a new customer service hub for station staff in the vicinity of the new ticket gates
- partial demolition of existing platform walls to improve pedestrian movement and improve accessible paths of travel which would require the removal of some existing wall tiles
- other platform modifications including new tiles and tactiles (where required) and relocation/replacement of seats etc to ensure compliant accessible paths of travel
- services relocation and/or adjustments, including lighting and communications systems (e.g. CCTV, public address (PA) system and hearing loops)
- temporary maintenance access and permanent emergency egress doors to the existing escalator motor room on Level 2 car park, requiring the temporary removal of three parking spaces
- station power supply upgrade works, which would include an upgrade to the existing main switchboards and distribution boards, cable replacement and new cable containment
- new/upgraded wayfinding signage and provision of the statutory/regulatory signage
- temporary site compounds for storage of materials and equipment

- temporary works (where required) during construction in order to maintain existing pedestrian 'level of service' such as access provisions and temporary ticketing facilities.

Interchange facilities (including the bus interchange)

- relocation of the existing bike cage to the northern end of the existing bus interchange
- installation of DDA accessible pedestrian crossings and pram ramps between the bus stands at the bus interchange, including associated demolition and pavement works
- installation of additional wind breaks on the bus islands
- closure of the existing redundant eastern stair case at the bus interchange
- provision of three kiss and ride spaces to the south of the station on New McLean Street converted from five existing timed parking spaces
- removal of existing vegetation on New McLean Street for a new DDA compliant accessible pedestrian access ramp
- construction of a new DDA compliant pedestrian access ramp, involving modification of the existing and installation of new support structures on New McLean Street to provide an accessible path of travel from the station concourse to the new kiss and ride at New McLean Street
- provision of an undercover bicycle rack and sheltered seating on New McLean Street
- new wayfinding signage and provision of other signage, including statutory/regulatory signage
- installation of tactile ground surface indicators (TGSIs)
- upgrades to existing lighting and installation of new lighting where required.

Materials and finishes

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

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

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

- lift shafts – steel, concrete and glass
- escalators – steel
- fire stairs – concrete
- bus interchange canopies and wind breaks – steel frame, glass and roof sheeting
- New McLean Street pedestrian access ramp –concrete

The design would be submitted to TfNSW's Urban Design and Sustainability Review Panel for comment before being accepted by TfNSW. An Urban Design Plan (UDP) and/or Public

Domain Plan (PDP) would also be prepared by the Contractor, prior to finalisation of the detailed design, for endorsement by TfNSW.

3.1.2 Engineering constraints

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

Existing structures: the placement and integrity of existing structures needed to be considered during the development of the design. These structures included station entrances, the existing McLean Street ramp, the island platform, Terrazzo flooring, blue tiling, tri-level signage and plywood ceilings. The works are being undertaken in an existing building and directly adjacent to commercial and residential buildings.

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.

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

- a water main and sewer line to the south of the station building (EastPoint Food Fair) in New McLean Street
- telecommunications cables
- underground electrical cables to the south of the station building (EastPoint Food Fair) in New McLean Street
- high pressure gas main to the south of the station building (EastPoint Food Fair)

Other considerations: Edgecliff Station is listed on the RailCorp (Sydney Trains) Section 170 Heritage and Conservation Register as having local heritage significance. In particular the terrazzo flooring, blue tiling, plywood ceilings, tri-level signage, long escalators, barrier box and ticketing windows are of exceptional significance and the drinking fountains, aluminium stair handrails and telephone booths are of high significance (refer to Section 6.5 for details of the heritage significance assessment).

3.1.3 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 Standards Authority standards
- Sydney Trains standards
- *NSW Sustainable Design Guidelines – Version 4.*0 (TfNSW, 2017b)
- *Guidelines for the Development of Public Transport Interchange Facilities* (Ministry of Transport, 2008).
- Crime Prevention Through Environmental Design (CPTED) principles
- other TfNSW policies and guidelines
- relevant council codes and standards.

3.1.4 Sustainability in design

The development of the concept design for the Proposal has been undertaken in accordance with the project targets identified in TfNSW's Environmental Management System (EMS) and the TfNSW Sustainable Design Guidelines - Version 4.0 (TfNSW, 2017b). The Guidelines 'seek to deliver sustainable development practices by embedding sustainability initiatives into the planning, design, construction, operations and maintenance of transport infrastructure projects', grouping sustainability into seven key themes:

- Energy and greenhouse gases
- Climate resilience
- Materials and waste
- Biodiversity and heritage
- Water
- Pollution control
- Community benefit.

These themes are further addressed through 14 requirements and 2 sub-requirements. The requirements are compulsory, subject to the Proposal meeting specific criteria such as Capital Expenditure thresholds.

The applicable requirements have been reviewed and approved by TfNSW and subsequently incorporated into the concept design as documented in Appendix C.

3.2 Construction activities

3.2.1 Work methodology

Subject to approval, construction is expected to commence in mid 2018 and take around 12 months to complete. The construction methodology would be further developed, during the detailed design of the Proposal by the nominated Contractor, in consultation with TfNSW.

The proposed construction activities for the Proposal are identified in Table 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 1 Indicative construction staging for key activities

Stage	Activities
Site establishment and enabling works	• establishment of site compounds (i.e. erect fencing, tree protection zones, site offices, amenities and plant/material storage areas) • establishment of temporary facilities as required (e.g. temporary access stairs, temporary toilets, temporary construction lights etc) • erect site hoarding around the different work fronts at Edgecliff Station • installation of power where required

Stage	Activities
Lift 1 works	• demolition of existing platform slab base to make space for the Lift 1 pit • waterproofing (as required), installation of reinforcement, formwork and concrete to form the lift 1 pit on the platform • demolition of floor slabs to make space for the new lift 1 shaft • erection of glass and steel shaft • lift installation and commissioning • architectural fit-out around lift shaft
Lift 2 works	• demolition of floor slabs to make space for the new lift 2 shaft • waterproofing (as required), installation of reinforcement, formwork and concrete to form the lift 2 pit • erection of glass and steel shaft • lift installation and commissioning • architectural fit-out around lift shaft
Escalators replacement	• demolition of motors and truss • demolition of floor finishes and concrete slabs at top and bottom landings • Form reinforce and pour concrete (FRP) for the construction of new concrete bearings • weld new intermediate steel supports • fit-out of escalator void and landings • erection of temporary works for the installation of new escalators • installation of new escalators • commissioning of new escalators
Fire stair construction	• demolition of floor slabs to make space for the new staircase from platform to concourse level • erect walls and build stairs • fit-out of new stairs
New McLean Street ramp and kiss & ride works	• removal of vegetation • install foundations and pre-cast concrete ramps • road works for new kiss and ride • installation of undercover bicycle racks • installation of seating and shelter
Ticket gate relocation	• remove existing gate line and move/install new gates • floor finishes around new and old gate line
Interchange upgrades	• pedestrian/wheelchair crossings levelling works • installation of additional wind breaks on the bus islands • bike shed relocation

Stage	Activities
Electrical upgrades	• new penetrations for cables, conduits, cable racks and trays through slabs and walls • fit-out and finishes in modified electrical rooms • electrical works
Platform modifications works	• demolition of rooms, doors relocations • construction of passing bays • ceilings and walls fit-out to modified platform areas

3.2.2 Plant and equipment

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

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

3.2.3 Working hours

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

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

Certain works may need to occur outside standard hours and would include night works as well as works 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 works are required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to ensure the safety of railway workers and operational assets. It is estimated that approximately three scheduled Sydney Trains rail possessions would be required to facilitate the following:

- establishment of temporary facilities (e.g. temporary pedestrian access to station, temporary toilets and construction hoardings)

- excavation and demolition for the lift shafts, including demolition of floor slabs and station platform
- demolition of existing escalators and motors, and preparatory works for new escalators
- construction of new fire stairs including required demolition works
- relocation of existing station ticket gates
- installation of the wind breaks on the bus islands
- platform building demolition and modifications for passing bays
- electrical upgrades

Out of hours works may also be undertaken outside scheduled rail possessions such as for the delivery of certain equipment and materials due to road restrictions on heavy haulage vehicles as well as road works needing to be undertaken outside of peak traffic periods.

Approval from TfNSW would be required for any out of hours work and the affected community would be notified in advance as outlined in TfNSW's *Construction Noise Strategy* (TfNSW, 2016a) (refer to Section 6.3 for further details).

3.2.4 Earthworks

Excavations and earthworks would generally be required for the following:

- the foundations for the lift shaft, which would require excavation at the platform up to a depth of two metres
- the foundations for the extended pedestrian access ramp at New McLean Street
- the construction of the upgraded footpath and kerb ramp on New McLean Street
- other minor civil works including drainage/stormwater works.

Excavated material would be reused onsite where possible or disposed of in accordance with relevant legislative requirements.

3.2.5 Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal, and would consider the requirements of the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2017b). Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

3.2.6 Traffic access and vehicle movements

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

- potential higher level of platform and concourse congestion arising from restricted access to these areas
- temporary increase in walking distance for rail customers on the station platform during installation of the new escalators
- higher road safety risk levels associated with construction vehicle-pedestrian interactions

- congestion at the bus interchange due to the reduced operational and circulation areas for buses and passenger pick-up and set-down
- confusion among bus customers as a result of temporary relocation of bus stands and access arrangements
- conflicts between buses and construction related vehicles accessing the site compound at the bus interchange
- temporary loss of parking availability (13 car parking spaces) at the level 2 car park
- temporary loss in parking availability along surrounding roads including New McLean Street
- temporary closure of New McLean Street and interruptions to traffic flow, particularly during road works
- minor disruptions to pedestrian/cyclist movements in and around the station and bus interchange
- a minor increase in traffic on the local road network.

A detailed construction methodology and associated management plans (such as a Construction Environmental Management Plan (CEMP)) would be developed during the next design phase of the Proposal to manage potential traffic and access impacts.

3.2.7 Ancillary facilities

Temporary construction compounds are required to accommodate a site office, amenities, laydown and storage area for materials. The following locations are being considered for use as construction compounds:

- an area on the southern side of the bus interchange
- an area directly west of the proposed pedestrian access ramp on New McLean Street
- an area on the unpaid concourse level around the proposed Lift 2 location
- an area on the gallery level around the proposed Lift 2 location
- an area on the platform around the proposed Lift 1 and fire stair location
- an area in the Level 2 car park around the Lift 2 location including a limited number of car park spaces
- an area in the Level 2 car park that provides access to the Lift 1 construction works for the purpose of delivering materials including a limited number of car park spaces
- temporary storage/laydown areas may also be required on the platform.

The areas nominated for temporary construction compounds are on land owned by RailCorp (managed by Sydney Trains), Woollahra Council and two (2) strata lot owners within the Edgecliff Station and Eastpoint Food Fair Shopping Centre building complex.

Figure 14, Figure 15, Figure 16 and Figure 17 show the proposed works areas and indicative construction compound locations.

3.2.8 Public utility adjustments

An upgraded electrical supply is required to accommodate the new infrastructure (e.g. new lifts and escalators) and would also supply power to the existing station lighting, communication

equipment, ticketing equipment, security and other general power requirements at the station. This work would require replacement of the main switchboards and distribution boards, replacement of existing electrical cabling and installation of new cable containment.

The Proposal has been designed to avoid relocation of services where feasible, however further investigation may be required. It is likely some services may require relocation, but such relocation is unlikely to occur outside of the footprint of the works assessed in this REF. In the event that works would be required outside of this footprint, further assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase.

3.3 Property acquisition

Private and Public land is impacted by the proposal. TfNSW must secure temporary and long-term property access rights. TfNSW preference is to reach agreement with impacted property owners. If agreements cannot be reached, then TfNSW may need to rely upon the use of compulsory acquisition pursuant to the Land Acquisition (Just Terms Compensation) Act 1991 to secure the requisite property access rights. The following property matters require further consideration and consultation with the building Strata Management (Owners Corporation) and relevant strata lot owners prior to, and during construction of the Proposal:

- The foundations for Lift 2 would be located in an existing parking area (Level 2 car park). A temporary construction compound would need to be established at this location and long term tenure for the area occupied by the lift shaft for ongoing operation of the lift.
- Fire access doors are required to provide egress from the escalator motor room which is located on the Level 2 car park.
- A new temporary material handling door is required from the escalator motor room (Level 2 car park).
- A temporary construction compound may be required within the Level 2 car park (refer to Section 3.2.7). A licence, lease or easement from either or both of the relevant adjoining strata lot owners would need to be secured prior to the occupation and use of this area.

Consultation with the Strata Management (Owners Corporation) and directly impacted lot strata owners regarding the Proposal and anticipated temporary and long term property impacts has commenced and would continue throughout detailed design and construction.

3.4 Operation management and maintenance

The future operation and maintenance of Edgecliff Station is subject to further discussions with Sydney Trains, TfNSW, affected strata owners and Woollahra Council. Structures constructed under this Proposal would likely be maintained by Sydney Trains and Woollahra Council.

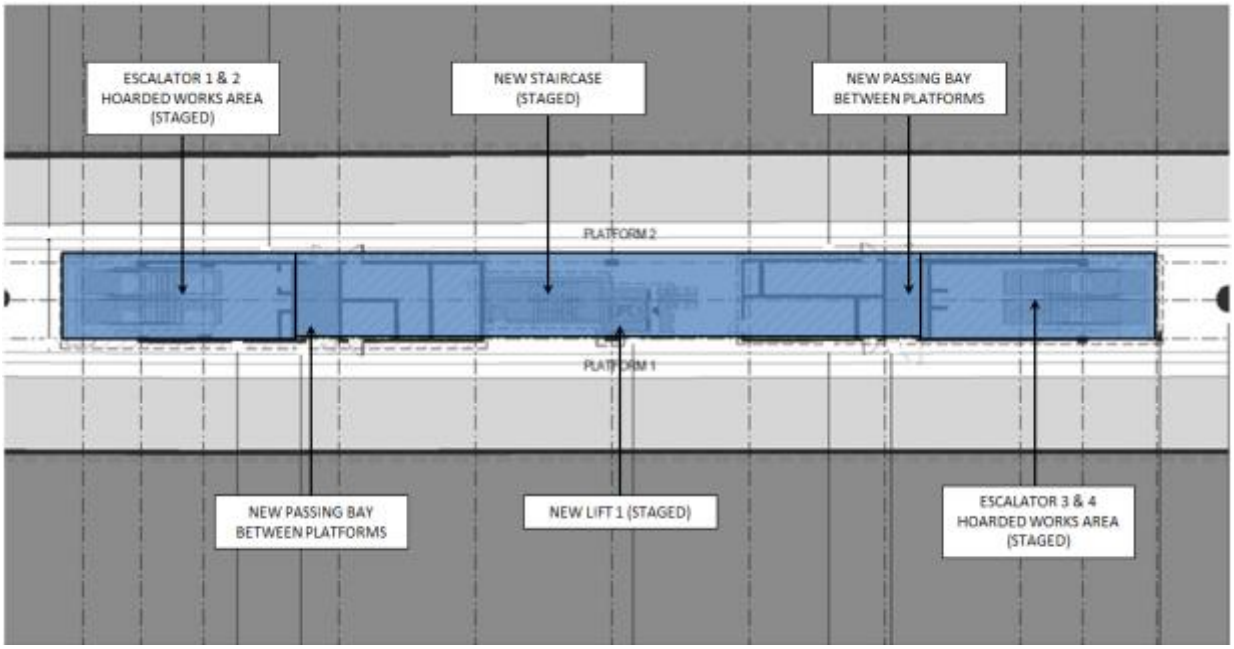

Figure 14 Platform level – site compound locations

(Indicative only, subject to detailed design)

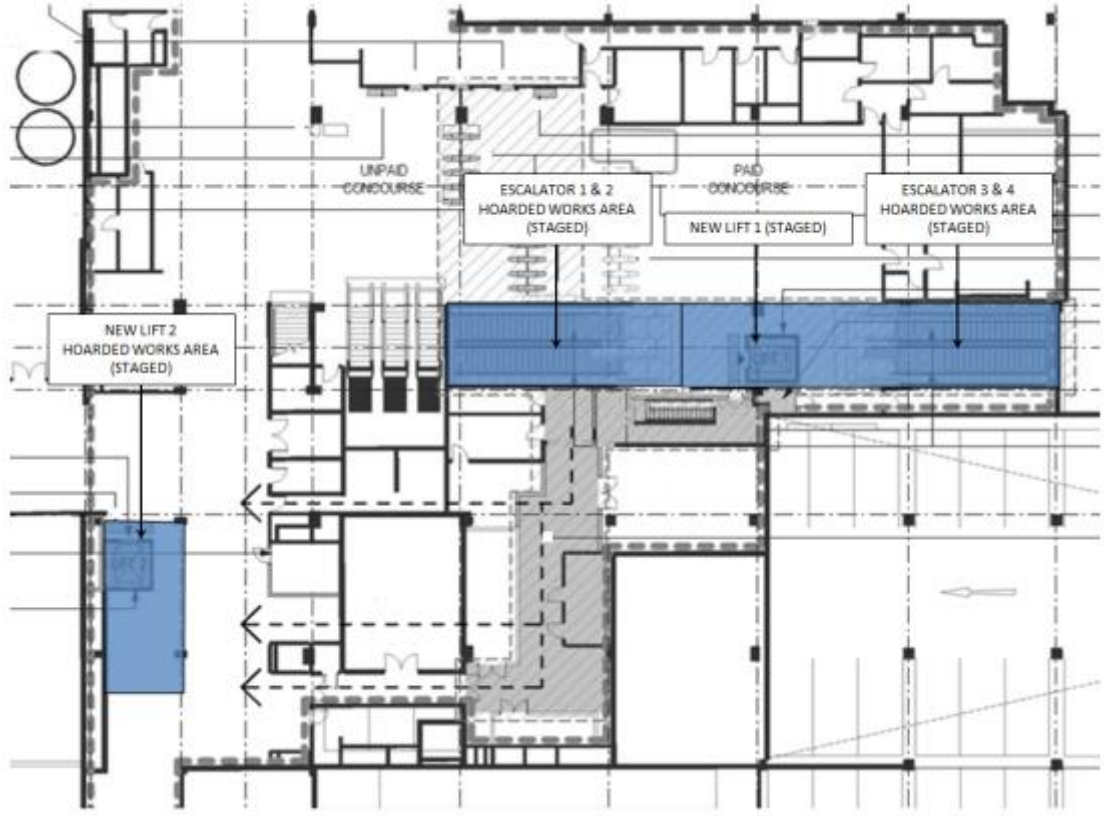

Figure 15 Concourse level – site compound location

(Indicative only, subject to detailed design)

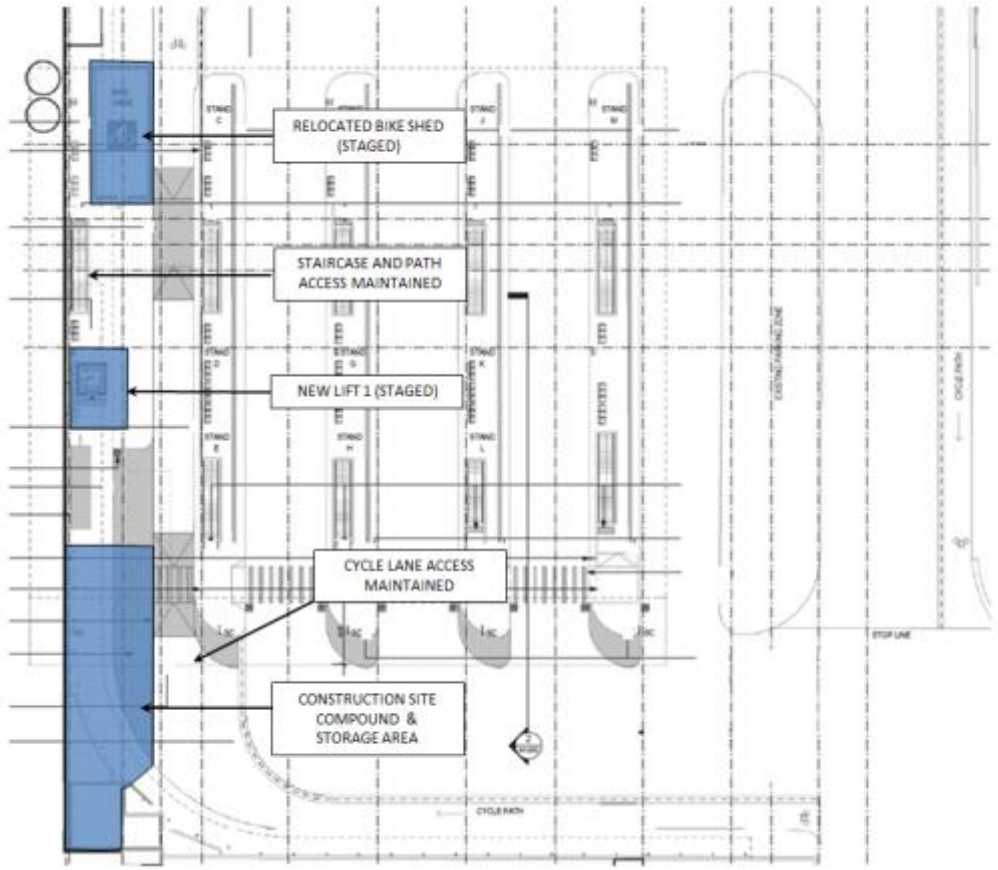

Figure 16 Bus interchange level – site compound location

(Indicative only, subject to detailed design)

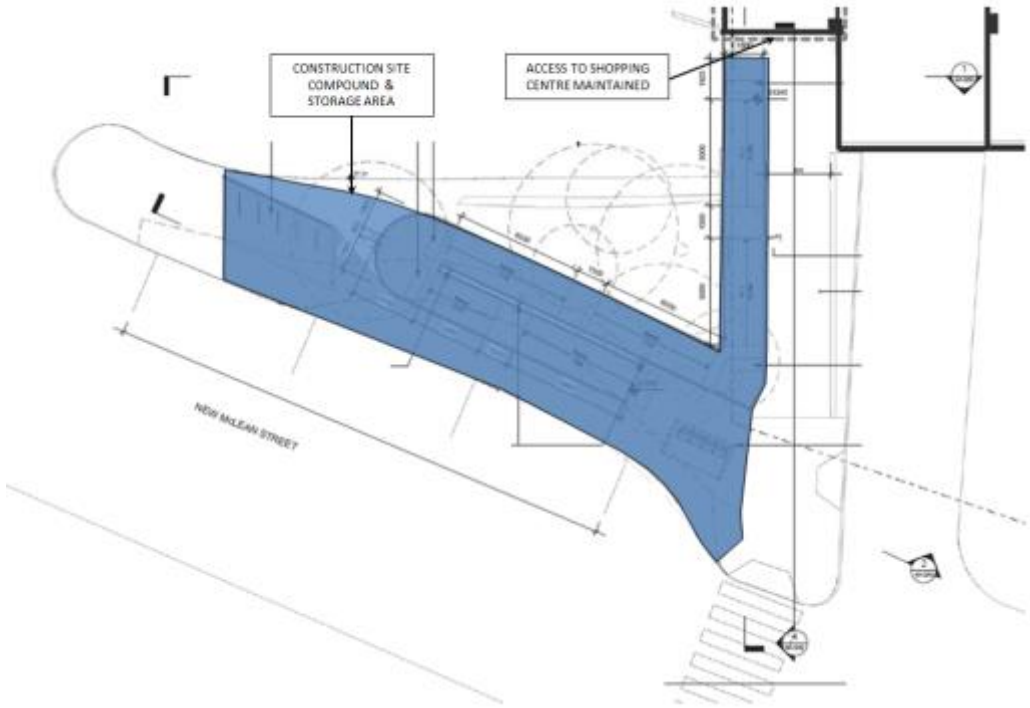

Figure 17 New McLean Street – site compound location

(Indicative only, subject to detailed design)

4 Statutory considerations

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

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

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

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

4.2 NSW legislation and regulations

4.2.1 Environmental Planning and Assessment Act 1979

The EP&A Act establishes the system of environmental planning and assessment in NSW. This Proposal is subject to the environmental impact assessment and planning approval requirements of Part 5 of the EP&A Act. Part 5 of the EP&A Act specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as TfNSW, which do not require development consent under Part 4 of the Act.

In accordance with section 111 of the EP&A Act, TfNSW, as the proponent and determining authority, must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the Proposal.

Clause 228 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Part 5 of the EP&A Act has a significant impact on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with clause 228 and Appendix B specifically responds to the factors for consideration under clause 228.

4.2.2 Other NSW legislation and regulations

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

Table 2 Other legislation applicable to the Proposal

Applicable legislation	Considerations
Contaminated Land Management Act 1997 (CLM Act) (NSW)	Section 60 of the CLM Act imposes a duty on landowners to notify the Office of Environment and Heritage (OEH), and potentially investigate and remediate land if contamination is above EPA guideline levels. The site has not been declared under the CLM Act as being significantly contaminated (refer Section 6.8).
Crown Lands Act 1987 (NSW)	The Proposal does not involve works on any Crown land.
Disability Discrimination Act 1992 (DDA Act) (Cwlth)	The Proposal would be designed having regard to the requirements of this Act.
Heritage Act 1977 (Heritage Act) (NSW)	• Sections 57 and 60 (approval) where items listed on the State Heritage Register are to be impacted • Sections 139 and 140 (permit) where relics are likely to be exposed • Section 170 where items listed on a government agency Heritage and Conservation Register are to be impacted. Edgecliff Station is listed on the RailCorp (Sydney Trains) Section 170 Heritage and Conservation Register and is of local heritage significance. The Proposal would impact on heritage fabric. A heritage assessment and archaeological review 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 the Heritage Act would be required. However, if unexpected archaeological items are discovered during the construction of the Proposal, all works would cease and appropriate advice sought, as per TfNSW's Unexpected Heritage Finds Guideline (TfNSW, 2016b). Formal notification is to be provided by the asset owner to the Heritage Council regarding the demolition of structures associated with the Edgecliff Station Group at least 14 days prior to the demolition of these structures in accordance with section 170A(1)(c) of the Heritage Act.
National Parks and Wildlife Act 1974 (NPW Act) (NSW)	Sections 86, 87 and 90 of the NPW Act require consent from OEH for the destruction or damage of Indigenous objects. The Proposal is unlikely to disturb any Indigenous objects (refer Section 6.4). However, if unexpected archaeological items or items of Indigenous heritage significance are discovered during the construction of the Proposal, all works would cease and appropriate advice sought.
Biosecurity Act 2015 (NSW)	Appropriate management methods would be implemented during construction if weeds declared noxious in Woollahra Municipal Council are encountered (refer Section 6.7).
Protection of the Environment Operations Act 1997 (PoEO Act) (NSW)	The Proposal does not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, TfNSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Contractor.

Applicable legislation	Considerations
Roads Act 1993 (Roads Act) (NSW)	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads. The Proposal would involve works on New McLean Street which is a local road under the control of Woollahra Municipal Council. Consent under the Roads Act is not required; however Road Occupancy Licence/s would be obtained from Woollahra Municipal Council for road works and any temporary road closures. Refer to Section 6.1 for more information.
Sydney Water Act 1994 (NSW)	The Proposal would not involve discharge of wastewater to the sewer.
Threatened Species Conservation Act 1995 (TSC Act) (NSW)	It is noted that the NSW *Biodiversity Conservation Act 2016* (BC Act) has replaced the TSC Act as of 25 August 2017. However in accordance with the transitional provision of the BC Act, this REF has been prepared as per requirements under the former TSC Act. The site does not contain suitable habitat for any listed threatened species or community and is unlikely to have a significant impact on any threatened species or community (refer Section 6.7).
Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW)	TfNSW 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 works, drainage or flood works, controlled activities or aquifer interference.

4.3 State Environmental Planning Policies

4.3.1 State Environmental Planning Policy (Infrastructure) 2007

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

Clause 79 of the Infrastructure SEPP allows for the development of 'rail infrastructure facilities' by or on behalf of a public authority without consent on any land (i.e. assessable under Part 5 of the EP&A Act). Clause 78 defines '*rail infrastructure facilities' as including elements such as 'railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms', public amenities for commuters' and 'associated public transport facilities for railway stations'.*

Consequently, development consent is not required for the Proposal which is classified as a rail infrastructure facility, however the environmental impacts of the Proposal have been assessed under the provisions of Part 5 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 of this REF discusses the consultation undertaken under the requirements of the Infrastructure SEPP.

It is noted that the Infrastructure SEPP prevails over all other environmental planning instruments except where *State Environmental Planning Policy (Major Development) 2005*,

State Environmental Planning Policy No 14 – Coastal Wetlands or *State Environmental Planning Policy No 26 – Littoral Rainforest* applies. The Proposal does not require consideration under these SEPPs and therefore do not require further consideration as part this REF.

4.3.2 State Environmental Planning Policy 55 – Remediation of Land

SEPP 55 provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. While consent for the Proposal is not required, the provisions of SEPP 55 have still been considered in the preparation of this REF.

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

4.4 Local environmental planning instrument and development controls

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

4.4.1 Woollahra Local Environmental Plan 2014

The *Woollahra Local Environmental Plan 2014* (Woollahra LEP) is the governing plan for the Woollahra LGA, including Edgecliff. Table 3 summarises the relevant aspects of the Woollahra LEP applicable to the Proposal. Figure 18 shows the relevant section of the zoning map from the Woollahra LEP, with the indicative location of the Proposal.

Table 3 Relevant provisions of the Woollahra LEP

Provision description	Relevance to the Proposal
Clause 2.3 - Zone objectives and Land Use Table	Under the Woollahra LEP: • the underground rail corridor is zoned as SP2 Infrastructure – Rail Infrastructure Facilities • Edgecliff Centre and EastPoint Food Fair, including the concourse, gallery and bus interchange, are zoned B2 Local Centre • Ascham School on the northern side of New South Head Road is zoned SP2 Infrastructure – Educational Establishment • Surrounding residential areas are zoned R3 – Medium Density and R2 Low Density • Trumper Park, Herbert Street Reserve and Edgecliff Square are zoned RE1 Public Recreation. The proposal is consistent with the objectives of these zones.
Clause 5.10 - Heritage conservation	Clause 5.10 of the Woollahra LEP aims to conserve the heritage significance of heritage items, archaeological sites, Aboriginal objects and Aboriginal places within the LGA. While Edgecliff Station is not listed under the Woollahra LEP, it is listed on the RailCorp (Sydney Trains) Section 170 Heritage and Conservation Register. A number of heritage items are listed on the Woollahra LEP and are located in the immediate vicinity of the Proposal including: • Ascham School precinct (LHR239) • Former Post Office and interiors (LHR240) • House and interiors (LHR241). A discussion of potential impacts to local heritage is discussed in Section 6.5.
Clause 6.2 - Earthworks	Clause 6.2 of the Woollahra LEP aims to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land. By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the Proposal is permissible without development consent. Consideration of the potential impacts and mitigation measures for earthworks for the Proposal is outlined in Section 6.8.

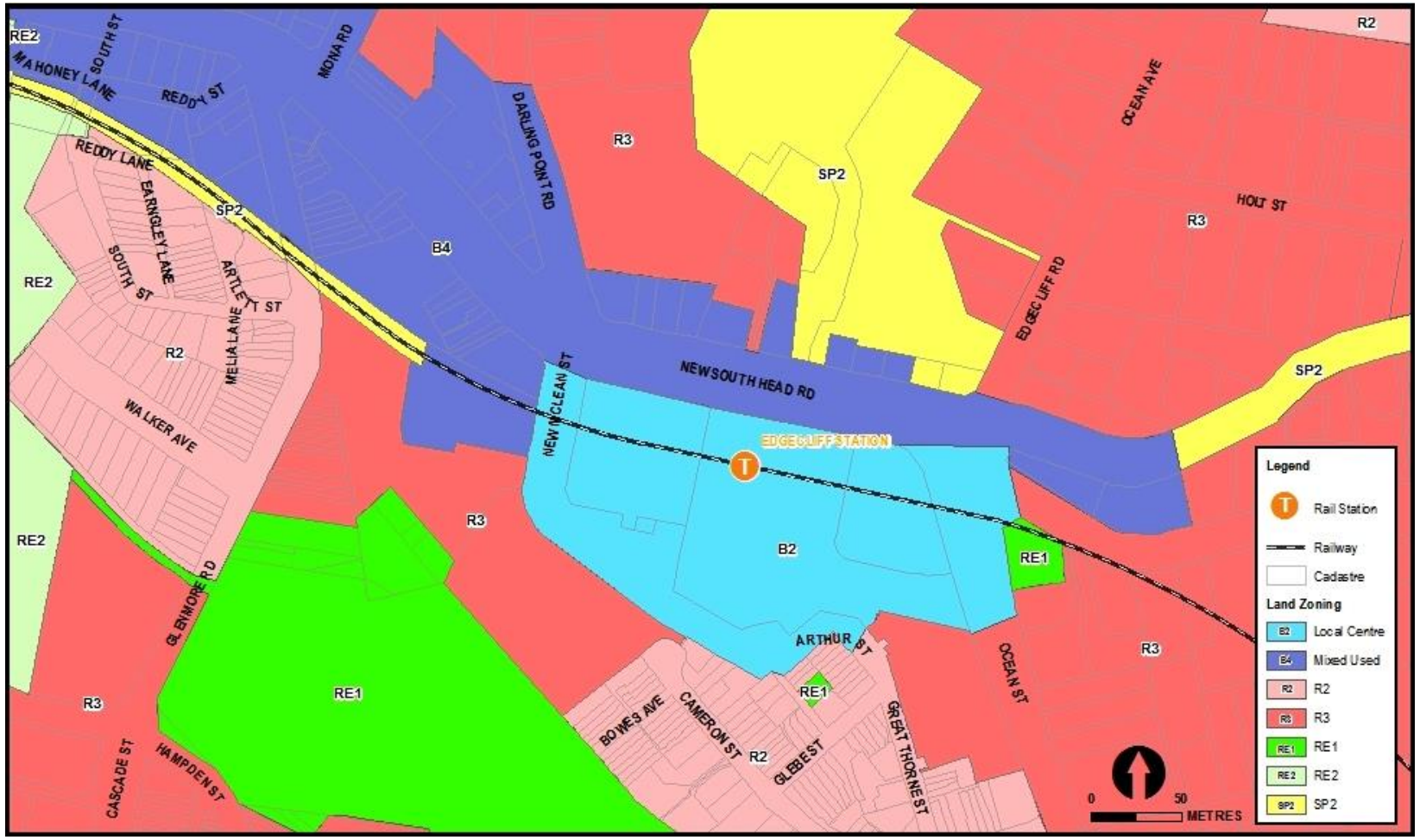

Figure 18 LEP zoning map

4.5 NSW Government policies and strategies

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

Table 4 NSW Government policies and strategies applicable to the Proposal

Policy/Strategy	Commitment	Comment
NSW Long Term Transport Master Plan (TfNSW, 2012a)	The *NSW Long Term Transport Master Plan* identifies a planned and co-ordinated set of actions to address transport challenges and will guide the NSW Government's transport funding priorities over the next 20 years. The Master Plan would meet a number of challenges to building an integrated transport system for Sydney and NSW, including: • customer-focused integrated transport planning • integrated modes to meet customer needs • getting Sydney Moving Again • sustaining Growth in Greater Sydney. The Master Plan links to NSW 2021, the Metropolitan Strategy for Sydney, the State Infrastructure Strategy, regional and sub-regional strategies, and national plans. The Master Plan will be built upon by the Future Transport 2056 Strategy (currently in draft).	The Proposal implements the following key themes in the Master Plan: • improving customers' journey experience • making better use of existing assets • providing accessible transport to help address social exclusion.
Draft Future Transport Strategy 2056 (TfNSW, 2017)	The Draft Future Transport Strategy is a vision for how transport can support growth and the economy of New South Wales over the next 40 years. This strategy is underpinned by the *Draft Regional Services and Infrastructure Plan* and the *Draft Greater Sydney Services and Infrastructure Plan* as well as a number of supporting plans including Road Safety and Tourism.	The Proposal supports the vision of the *Draft Future Transport Strategy* by providing accessible services for people who find it difficult to access public transport services. Lifts and a complaint ramp will provide a physically accessible network allowing more choice for people with mobility constraints. Greater accessibility will also mean better connections to places and opportunities for employment, education, business and enjoyment.
Disability Action Plan 2012-2017 (TfNSW, 2012b)	The *Disability Action Plan 2012-2017* was developed by TfNSW in consultation with the Accessible Transport Advisory Committee, which is made up of up of representatives from peak disability and ageing organisations within	The Proposal has been developed with consideration of the objectives outlined in this Plan and seeks to improve and provide equitable access to public transport facilities.

	NSW. The Disability Plan discusses the challenges, the achievements to date, the considerable undertaking that is required to finish the job, and provides a solid and practical foundation for future progress over the next five years.	
Sydney's Walking Future - Connecting people and places (TfNSW, 2013a)	*Sydney's Walking Future* outlines the NSW government's efforts to: • promote walking for transport • connect people to places through safe walking networks around activity centres and public transport interchanges.	The Proposal would facilitate walking by removing physical barriers to accessible public transport and providing accessible links between transport modes, hence contributing a relative reduction in local trips via private cars.
Sydney's Cycling Future - Cycling for everyday transport (TfNSW, 2013b)	*Sydney's Cycling Future* outlines the NSW government's commitment to a safe and connected network of bicycle paths as an important part of Sydney's integrated transport system. The government wants to make bike riding a convenient and enjoyable option by improving access to towns and centres, and investing in bicycle facilities at transport hubs.	The Proposal supports the government's Bike and Ride initiative that better integrates bicycle riding with other modes of transport, making it convenient to ride to transport hubs, park bicycles securely and transfer to public transport as part of longer transport journeys. The Proposal includes provision of a new undercover bicycle rack on New McLean Street with capacity for 10 bicycles. This would be in addition to the bicycle cage at the bus interchange (which would be relocated as part of the Proposal) which has capacity for 48 bicycles and the existing bicycle rack on New South Head Road which has capacity for 10 bicycles. In total there would be capacity for 68 bicycles around the station once the Proposal is operational.
Rebuilding NSW – State Infrastructure Strategy 2014 (NSW Government, 2014)	*Rebuilding NSW* is a plan to deliver $20 billion in new productive infrastructure to sustain productivity growth in our major centres and regional communities. Rebuilding NSW will support overall population growth in Sydney and NSW. Public transport is viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal.	The Proposal supports investment in rail infrastructure, and aligns with the reservation of $8.9 billion for urban public transport to support Sydney's population, that is expected to reach almost six million by 2031.
A Plan for Growing Sydney (Department of Planning and	*A Plan For Growing Sydney* superseded the draft *Metropolitan Strategy for Sydney 2036*. The Plan provides information on the strategies to accommodate an	The Proposal is consistent with the objectives of this Plan and would deliver improved travel to and between modes, encourage greater public transport use and better integrate interchanges with

Environment, 2014)	additional 664,000 homes and 689,000 jobs by 2031, which in part will be helped by a more integrated transport network. The Proposal is located in the Central subregion and the priorities relevant for the Woollahra area include: • identify suitable locations for housing intensification and urban renewal along key public transport corridors including the Eastern Suburbs and Illawarra Line	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 residential development and the local economy.
NSW: Making It Happen (NSW Government, 2015)	In September 2015, the NSW Government announced a series of State Priorities as part of *NSW: Making It Happen* (NSW Government, 2015). The State Priorities are intended to guide the ongoing actions of the NSW Government across the State, and guide resource allocation and investment in conjunction with the NSW Budget. *NSW: Making it Happen* focuses on 12 key 'priorities' to achieve the NSW Government's commitments. These priorities range across a number of issues including infrastructure, the environment, education, health, wellbeing and safety in addition to Government services. One of the 12 priorities identified as part of *NSW: Making It Happen* relates to investment in building infrastructure. The ongoing development and investment in transport infrastructure is identified as part of the wider building infrastructure priority.	The Proposal assists in meeting the priority by improving accessibility to public transport and encourage greater use of public transport.
Draft Greater Sydney Region Plan and the ***Revised draft Eastern City District Plan*** (Greater Sydney Commission. 2017)	The *Draft Greater Sydney Region Plan* outlines how Greater Sydney will manage growth and change and guide infrastructure delivery. It sets the vision and strategy for Greater Sydney, to be implemented at a local level through the *Revised draft Eastern City District Plan*. The Plans have been prepared in conjunction with the NSW Government's *Future Transport 2056 Strategy* and informs Infrastructure NSW's *State Infrastructure Strategy* providing full integration of land use, transport and infrastructure planning.	The Proposal would assist in meeting the objectives of the *Draft Greater Sydney Region Plan* and the *Revised draft Eastern City District Plan* by providing greater accessibility to public transport. The provision of lifts and compliant ramp would provide easy access to trains and buses. Additional bike racks will aid in making cycling to other modes of transport more convenient. The improved access and additional bike racks at Edgecliff Station will provide greater connectivity between public transport to town centres, open spaces and public places which is in line with the

		District Plan Planning Policy E10 - *Delivering integrated land use and transport planning and a 30-minute city* .
Woollahra 2025 (Woollahra Municipal Council, 2013)	*Woollahra 2025 – Our community, our place, our plan* is the Community Strategic Plan for the Woollahra LGA and represents the community's long term vision for the LGA. The plan outlines key themes and associated goals and strategies to meet the needs of the LGA, one of which is to create quality places and spaces through accessible and integrated public transport, pedestrian and cycle networks.	The Proposal would assist in meeting the goals of the Plan by delivering improved accessibility to public transport and facilities for bicycles.
Woollahra Bicycle Strategy 2009 (Woollahra Municipal Council, 2009)	The *Woollahra Bicycle Strategy* seeks to improve the bicycle network within the Woollahra LGA so that cycling becomes a legitimate and viable form of transport. A key element of the strategy is to develop cycle facilities at/to public transport interchanges and urban villages, including Edgecliff Station.	The Proposal is consistent with this element of the Strategy and includes the provision of new undercover and secure bicycle facilities. In total there would be capacity for 68 bicycles around the station once the Proposal is operational.

4.6 Ecologically sustainable development

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

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

The principles of ESD have been adopted by TfNSW throughout the development and assessment of the Edgecliff Station Upgrade. Section 3.1.4 summarises how ESD would be incorporated in the design development of the Proposal. Section 6.13 includes an assessment of the Proposal on climate change and sustainability, and 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

As part of the design development for the Proposal, TfNSW held a number of workshops in 2015 with various internal TfNSW stakeholders, Sydney Trains and Roads and Maritime Services (Roads and Maritime). The purpose of the workshops was to develop and discuss concept design options and identify a preferred option.

External stakeholder consultation also took place with Woollahra Municipal Council on 2 June 2015 to discuss the purpose of the study and gain an understanding of issues, opportunities and challenges for Edgecliff Station and the surrounding area.

An additional meeting was held with Woollahra Municipal Council on 25 September 2017. Council noted their general support for the Proposal, in particular the installation of lifts to improve access to the station platform and bus interchange. The following key issues were raised for consideration during the development of the preferred option:

- suitability of New McLean Street for kiss and ride
- additional traffic impacts from New McLean Street kiss and ride
- management of conflict points between pedestrian and vehicles at New McLean Street
- extent of land acquisition required for the proposed pedestrian access ramp on New McLean Street
- location of future landscaping to replace vegetation that is proposed to be removed.

Consultation with the community was also undertaken in May 2017 to invite feedback on the concept design and inform the development of the preferred option. This included:

- distribution of flyers to the customers and the community
- pop up information stalls at the station to allow customers and community members to speak with the project team and provide immediate feedback on the concept design

The following key issues were raised during this consultation and were considered during development of the preferred option:

- general support for the Proposal, in particular the installation of lifts to improve accessibility
- potential for congestion around Lift 1 in the paid station concourse
- lifts should provide access to all levels within the station building, including the station platform, concourse, gallery and bus interchange
- additional lighting, wind and rain protection is required at the bus interchange
- kiss and ride should be provided at the bus interchange, New South Head Road, or New McLean Street

The preferred option largely incorporates these considerations including two lifts which would provide access to all levels within the station building, additional canopy coverage and wind breaks at the bus interchange and a kiss and ride area on New McLean Street. The ticket gates and escalators would also be relocated to reduce congestion within the paid station concourse.

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

Table 5 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 | Consultation with Councils – development with impacts on council related infrastructure and services	Consultation is required where the Proposal would result in: • substantial impact on stormwater management services • generating traffic that would place a local road system under strain • involve connection to or impact on a council owned sewerage system • involve connection to and substantial use of council owned water supply • significantly disrupt pedestrian or vehicle movement • involve significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes works that would: • require connections or impacts the stormwater system • disrupt pedestrian and vehicle movements • impact on road pavements under Council's care and control • impact on Council-operated footpaths. Consultation with Woollahra Municipal Council has been undertaken and would continue throughout the detailed design and construction phases.
Clause 14 | Consultation with Councils – development with impacts on local heritage	Where railway station works: • substantially impact on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area.	Edgecliff Station is not listed as a local heritage item in the Woollahra LEP. There are a number of items of local heritage significance nearby including the Ascham School precinct (LHR239), the Former Post Office and interiors (LHR240), and House and interiors (LHR241). Each of these places is more than 30 metres from the Proposal area and it is not anticipated that they will be impacted by the works. Consultation with Woollahra Municipal Council is not required under clause 14 of the Infrastructure SEPP.

Clause	Clause particulars	Relevance to the Proposal
Clause 15 | Consultation with Councils – development with impacts on flood liable land	Where railway station works: • impact on land that is susceptible to flooding – reference would be made to *Floodplain Development Manual: the management of flood liable land.*	The Proposal is 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 16 | Consultation with public authorities other than Councils	For *specified development* which includes consultation with the OEH 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 TfNSW may consult with could include: • Roads and Maritime Services (Roads and Maritime) • Sydney Trains • OEH.	The Proposal is not located adjacent to land reserved under the NPW Act. Accordingly, consultation with the OEH on this matter is not required. The roads surrounding the development are owned and managed by both Woollahra Municipal Council and Roads and Maritime. Accordingly, consultation with Roads and Maritime has been undertaken. Relevant permits and/or approvals would be obtained from the relevant roads authority prior to/during construction as required.

5.3 Consultation strategy

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

The objectives of the consultation strategy are to:

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

5.4 Public display

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

- public display of the REF at various locations

- advertisement of the REF public display in local newspapers with a link to the TfNSW website that includes a summary of the Proposal and information on how to provide feedback
- distribution of a project update at the station, and to the local community and rail customers, outlining the Proposal and inviting feedback on the REF
- direct notification to community stakeholders to invite feedback on the Proposal
- door knocking local businesses
- pop up information stalls at the station to allow customers and community members to speak with the project team
- installation of posters at the station and interchange
- flyer distribution at local events to allow community members to speak with the project team and provide immediate feedback on the Proposal
- distribution of flyers within approximately 300 metres radius of the station to the suburbs of Edgecliff, Paddington and Rushcutters Bay
- consultation with Woollahra Municipal 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 approximately three weeks.

The REF would be placed on public display at the following locations:

1. Woollahra Municipal Council Office, 536 New South Head Road, Double Bay
2. Woollahra Library, Level 1, 451 New South Head Road, Double
3. Transport for NSW Office, Level 5, Tower A, Zenith Centre, 821 Pacific Highway, Chatswood.

The REF would also be available on the TfNSW website[2]. Information on the Proposal would be available through the Project Infoline (1800 684 490) or by email[3]. During this time feedback is invited. Following consideration of feedback received during the public display period, TfNSW would determine whether to proceed with the Proposal and what conditions would be imposed on the project should it be determined to proceed.

5.5 Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal plus a 200 metre radius, on 24 October 2017. No Aboriginal heritage items or sites were identified in the search results.

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

[2] http://www.transport.nsw.gov.au/projects-tap
[3] projects@transport.nsw.gov.au

5.6 Ongoing consultation

At the conclusion of the public display period for this REF, TfNSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by TfNSW before determining whether to proceed with the Proposal (refer Figure 1, page 15).

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

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

6 Environmental impact assessment

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

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

6.1 Traffic and transport

A Traffic, Transport and Access Impact Assessment was prepared for the Proposal (AECOM, 2017a). The assessment included a desktop analysis and site inspection on 19 July 2017 of the existing traffic, transport and pedestrian access environment surrounding Edgecliff Station. Detailed traffic counts and modelling were not considered necessary as the Proposal is focused on the station area and is unlikely to have a major impact on the surrounding road network. The findings of the assessment are summarised in this section.

6.1.1 Existing environment

Edgecliff Interchange precinct is a transport hub providing Edgecliff and surrounding suburbs key links and connections to Sydney's transport network. The interchange precinct is located within the Edgecliff Local Centre, approximately 4 km east of the Sydney CBD.

The Edgecliff Interchange precinct provides people the opportunity to access and transfer between transport facilities including cycling, train, bus and taxi. It is centred on Edgecliff Station with interchange facilities provided along New South Head Road and a bus interchange located above Eastpoint Food Fair.

Edgecliff Station is served by the T4 Eastern Suburbs & Illawarra Line providing train services between Cronulla or Waterfall and Bondi Junction. Edgecliff Station is the 35th busiest station on the Sydney Trains network, with approximately 14,100 trips per average weekday recorded in 2014 (BTS, 2014). There has been a significant increase in patronage at Edgecliff Station since 2010 increasing by approximately 1,740 trips (14 per cent).

The station is located underground and runs parallel with New South Head Road. A paid concourse level with entrances from New South Head Road and New McLean Street provides access to two sets of escalators that provides a link to the platform level.

Edgecliff Station consists of one island platform, with two platforms that are serviced by the T4 Eastern Suburbs and Illawarra Line. Platform 1 is located on the southern side of the platform providing services to Waterfall or Cronulla via the City. Platform 2 is located on the northern side of the platform providing services to Bondi Junction.

The number of rail services stopping at Edgecliff during the AM and PM two-hour peak periods is shown in Table 6.

Table 6 Rail services at Edgecliff Station

Key destination	AM weekday peak (07:00 – 09:00)	PM weekday peak (16:00 – 18:00)
Waterfall or Cronulla to Bondi Junction	32	32
Bondi Junction to Waterfall or Cronulla	31	32

Road network and traffic

The existing roads in the vicinity of Edgecliff Station include New South Head Road (north), New McLean Street (south and west) and Ocean Street (east).*New South Head Road*

New South Head Road is a classified state road aligned in an east-west direction generally with three traffic lanes in each direction for the majority of the corridor. During peak periods, clearway restrictions (T2 – transit lane) apply to the kerbside lane in the peak direction. The transit lanes apply in the westbound direction during the morning peak period (6am to 10am) and eastbound direction during the afternoon peak period (3pm – 7pm).

A signalised pedestrian crossing is provided on New South Head Road at the main entrance to Edgecliff Station. An additional kerbside lane is provided in the westbound direction to cater for interchange facilities (bus zone and taxi zone) for the precinct and a 'No stopping' zone which allows Australia Post vehicles to collect mail from the post boxes.

The posted speed limit is 60 km/h and short term kerbside parking is permitted intermittently outside of the AM and PM periods.

New McLean Street

New McLean Street is a local road running along the southern and western perimeter of Edgecliff Centre and Eastpoint Food Fair. The road provides one traffic lane and an intermittent short term kerbside parking lane in each direction. New McLean Street also provides footpaths on both sides, a zebra pedestrian crossing to access the interchange precinct and a marked on-road cycleway. The posted speed limit is 50 km/h.

Ocean Street

Ocean Street is a regional road aligned in a north-south direction with one traffic lane and one parking lane in each direction for the majority of the corridor. The road widens to two traffic lanes in each direction between New South Head Road and Albert Street. Ocean Street serves as a major north-south corridor between Bondi, Edgecliff and Double Bay. The road provides footpaths on either side of the road, with signalised pedestrian crossings at most signalised intersections in the corridor. The posted speed limit is 50 km/h.

Parking

No commuter car park is provided for the interchange precinct. Parking restrictions on surrounding roads limit the opportunity for commuters to drive to the station. Paid off-street parking facilities are provided from New McLean Street for ALDI and Eastpoint Food Fair.

On-street restricted parking is provided on the surrounding local road network including New McLean Street. These spaces are located within the local centre and due to their time restrictions are not available exclusively to rail customers.

Taxi and kiss and ride facilities

A taxi zone is located along New South Head Road near the intersection with New McLean Street and provides four spaces for taxis.

Edgecliff Station currently does not provide formal signposted kiss and ride areas in the vicinity of the precinct.

Kiss and ride movements are likely to occur at short-term (one hour) parking areas and have been observed to informally occur at the following locations:

- the no stopping zones on New McLean Street and New South Head Road
- bus zones on New South Head Road
- when traffic lights are red at the signalised pedestrian crossing on New South Head Road.

The following site observations were undertaken by AECOM on 19 July 2017 at New South Head Road and New McLean Street between 5:15pm to 6:15pm (consistent with the PM peak hour identified for pedestrian movements at the station from Austraffic's pedestrian counts):

New South Head Road

- mainly used to quickly drop off passengers within the bus zone. Vehicles would wait within the bus zone to also pick-up passengers, however if a bus was about to pull in, drivers would either wait at the No Stopping zone in front of the Australia Post boxes (if available) or continue driving
- a total of 38 drop-offs and 11 pick-ups were observed within the hour where a maximum of three vehicles dropping-off passengers were observed to occur at the same time.

New McLean Street

- mainly used to pick up passengers with vehicles waiting between 3-15mins either informally parked along No Parking and No Stopping zones or double parked at the 1P zone in front of the existing ramp at the New McLean Street entrance
- a total of 3 drop-offs and 27 pick-ups were observed within the hour where a maximum of four vehicles waiting to pick-up passengers were observed to occur at the same time.

Bus services

Several bus routes currently stop within the Edgecliff Bus Interchange and at the bus stop located north of the main entrance to the station on New South Head Road. These bus routes connect residential areas to local transport interchanges, employment areas and retail areas. The bus routes servicing Edgecliff Transport Interchange provide connections to Bondi Junction, Chatswood, Watsons Bay and the Sydney CBD. A summary of the public bus services operating in peak periods is provided in Table 7.

Table 7 Bus services frequency (mins) at Edgecliff Interchange Precinct

Route number	Description	Frequency (mins)	
		AM peak (07:00 – 09:00)	PM Peak (16:00 – 18:00)
200	Bondi Junction to Edgecliff/Chatswood[1]	20	20
200	Chatswood/Edgecliff to Bondi Junction	20	20
323	Dover Heights to City[1]	30	-
323	City to Dover Heights	-	30
324	Watsons Bay to City[1]	20	30
324	City to Watsons Bay	10	20
325	Watsons Bay to City[1]	20	30
325	City to Watsons Bay	30	30
326	Bondi Junction to City[1]	30	30
326	City to Bondi Junction	30	30
327	Bondi Junction to City	20	30

Route number	Description	Frequency (mins)	
		AM peak (07:00 – 09:00)	PM Peak (16:00 – 18:00)
327	City to Bondi Junction	30	30
328	Darling Point to Bondi Junction	30	30
L24	Watsons Bay to City (limited stops)	20	-
N100[2]	Central to Bondi Junction	30	30
N100[2]	Bondi Junction to Central	30	30

Notes:

1. *Services stop at New South Head Road, not within the Edgecliff Bus Interchange*
2. *NightRide services, available Friday to Sunday from 12:30am to 5:30am*

A number of school bus routes also operate to and from Edgecliff Bus Interchange, during the AM and PM Peak periods before and after school, including:

- 613e – to Sydney High Schools
- 673e – to Kincoppal Rose Bay
- 603e – to Rose Bay Secondary College
- 719e – to Sydney French School
- 721e – to Scots College
- 725e – to Sydney Grammar School.

In addition to the bus routes operating in the AM and PM peak periods, an off-peak NightRide route (N100) operates along New South Head Road near Edgecliff Station providing late night services between Bondi and the CBD.

The layout of the bus interchange currently provides four bus ranks, each with space for two stands and a set-down area.

Bicycle network and facilities

The bicycle network within 800 metres of Edgecliff Station mainly comprises of on-road bicycle routes. On-road bicycle routes are currently on Edgecliff Road, Trelawney Street, Ocean Avenue, Bay Street, Darling Point Road, Glenmore Road Cooper Street, Cross Street and New McLean Street.

The on-road bicycle routes on Darling Point Road, New McLean Street, Cameron Street and Thorne Street provide cyclists connections to the New McLean Street entrance of the interchange. There is currently limited bicycle storage facilities located near the entrance.

In terms of bicycle storage facilities, Edgecliff Interchange Precinct is classified as a Level A interchange, which requires a minimum of 50 bicycle cage spaces and 20 undercover bicycle rack spaces.

Five bicycle racks are currently present along New South Head Road and one bicycle rack located on New McLean Street which provides capacity for 12 bicycles.

On the bus interchange level, a new bicycle cage has been recently delivered by the NSW Government, which provides 48 bicycle spaces for customers riding a bike to the precinct. This also includes a formalised cycle path within the bus interchange, running in a clockwise

direction around the bus stands, with shared vehicle / bicycle entrance/exit driveways and appropriate signage and line markings to ensure safety and guidance for cyclists accessing bike storage facilities.

Pedestrian facilities

Pedestrian access to Edgecliff Station is provided through Eastpoint Food Fair. The centre can be accessed from the main entrance on New South Head Road and a secondary access in the form of a ramp on New McLean Street. On the concourse level, escalators (two in each direction) provide direct access to the platform level and are positioned in the paid area behind the ticket gates.

The bus interchange is located two levels above the concourse level. Escalators and stairs provide access from the concourse level to the gallery level. From the gallery level, stairs provide a link to the bus interchange level. Each bus rank is provided with two sets of stairs from the gallery level.

Footpaths are present along both sides of New South Head Road, Ocean Street and New McLean Street as well as a majority of other roads surrounding the station. Signalised pedestrian crossing facilities are provided at the midblock of New South Head Road in front of the main entrance to Edgecliff Station / Eastpoint Food Fair and on all approaches of the New South Head Road / Ocean Street intersection. A zebra crossing is provided on New McLean Street providing improved access to the building. These facilities provide a safe crossing point to and from the interchange and station.

The pedestrian count undertaken by Austraffic on 29 April 2015 surveyed station platform movements during the AM and PM period. Results of the data indicated the AM peak hour pedestrian movement occurred between 7.45am and 8.45am and the PM peak hour occurred between 5.15pm and 6.15pm.

Analysis of the AM peak hour pedestrian movement at the station showed the following travel patterns:

- approximately 73 per cent of station entries originated from the New South Head Road entrance
- approximately 67 per cent of station entries opted to use the western escalator (closest escalator from ticket gate) to access the platform
- the majority of station entries were destined for Platform 1 (train services to City)
- there was an even split of passengers using the western and eastern escalators when exiting the platform.

Analysis of the PM peak hour pedestrian movement at the station showed the following travel patterns:

- the PM peak hour movements showed the western escalator was used more for both the entry and exit movements
- the majority of station exits were from passengers alighting from Platform 2.

6.1.2 Potential impacts

a) Construction phase

Customer and public access

Construction activities are anticipated to impact pedestrians and customers given the restricted area in which construction works are to be carried out. There may also be changes to how customers access the station platform, interchange facilities and adjacent footpaths

which could result in longer walking distances and/or higher levels of congestion during peak periods.

During construction, works would be undertaken in a manner to ensure that public access routes to the station are maintained. The proposed works are expected to cause temporary disruptions to the existing pedestrian facilities surrounding the station, particularly for pedestrians accessing the station via the New McLean Street entrance as construction of the proposed ramp is being undertaken. This has the potential for increased safety risks for pedestrians due to potential interactions with construction plant and vehicles. Temporary access would be put in place and appropriate signs and/or traffic controllers would be positioned to notify pedestrians of the temporary arrangements. Impacts to pedestrians during construction would be managed through the development of a Construction Traffic Management Plan (CTMP) and associated Traffic Control Plans (TCPs) by the Contractor.

Pedestrian movements along the station platform would be impacted during the staged replacement of the escalators and the construction of the fire stairs at platform level. The replacement of escalators would temporarily increase the walking distances for rail customers along the platform, requiring pedestrians to walk to an operating escalator or to the lift that is operational. The reduced space on the platform may increase pedestrian congestion and reduce the amount of standing area for customers. Appropriate signage would be provided to mitigate any potential impacts to pedestrian movements on the platform.

The proposed site compound on the bus interchange level would require the northern stairs to be closed off and would provide a single lane for cyclists to egress from the bicycle cage located at bus interchange level. The closure of the stairs would require cyclists and pedestrians to use other available stairs.

Mitigation measures would be subject to further consideration during detailed design and construction planning in consultation with the relevant authorities. Notification would be provided to the community on alternative transport arrangements (including changes to pedestrian access).

Road network and traffic

A quantitative construction traffic impact assessment would be undertaken following the confirmation of the detailed construction methodology during detailed design as part of the CTMP.

Construction of the Proposal would result in a minor temporary increase in traffic as a result of the following:

- delivery of construction materials
- delivery and removal of construction equipment and machinery
- movement of construction personnel.

Traffic generated by construction vehicles, including staff vehicles, is likely to be minimal given the nature of the works proposed and would fluctuate dependant on the construction stage. Construction workers would be encouraged to use public transport to travel to and from the site.

Heavy vehicles would be restricted to non-peak periods and scheduled rail possessions where possible to minimise disruptions to traffic. It may also be necessary to undertake other construction activities, such as concrete pours and delivery of oversized materials, outside standard construction hours to minimise traffic disruption. It has also been identified that construction materials could be delivered by hi-rail vehicles, which would minimise the construction impact on traffic.

Construction activities would require temporary partial lane closures and/or traffic diversions at a section of New McLean Street, which would need a Road Occupancy Licence for the

temporary road closure. This would result in impacts to vehicles accessing the retail and residential car parks located nearby.

A section of New McLean Street (close to the existing ramp and pedestrian crossing) may be temporarily closed for access or operations from two lanes to one lane during construction activities. These works would likely be undertaken outside of peak periods or during rail shutdowns and would be managed with appropriate signage and traffic control to guide vehicles.

Temporary diversions would be determined during detailed design, would be identified in the CTMP, and would be managed with appropriate signage and traffic control, to direct vehicles along the diversion. The appropriate Road Occupancy Licences would be obtained where required.

Access for emergency vehicles would be maintained in accordance with emergency vehicle requirements. Emergency services would be advised of all planned changes to traffic arrangements prior to applying the changes.

Overall, provided the proposed traffic management measures are implemented, the likely impact to traffic during construction is expected to be manageable and would not have a major impact on the level of service of the surrounding road network.

Construction vehicle routes

Figure 19 shows the potential access routes to the station as well as Roads and Maritime approved B-double routes nearby. The routes provide a connection between the site and the approved routes, based on roads identified as having appropriate widths to allow for temporary use as a haulage route. The nearest approved B-double routes accessible are Anzac Parade and Driver Avenue.

These approved B-double roads would have sufficient road widths to accommodate larger vehicles, making them ideal for the haulage routes, however are subject to sign-posted restrictions. Heavy vehicle movements close to the Edgecliff Local Centre and schools would be restricted during peak times and school zone hours.

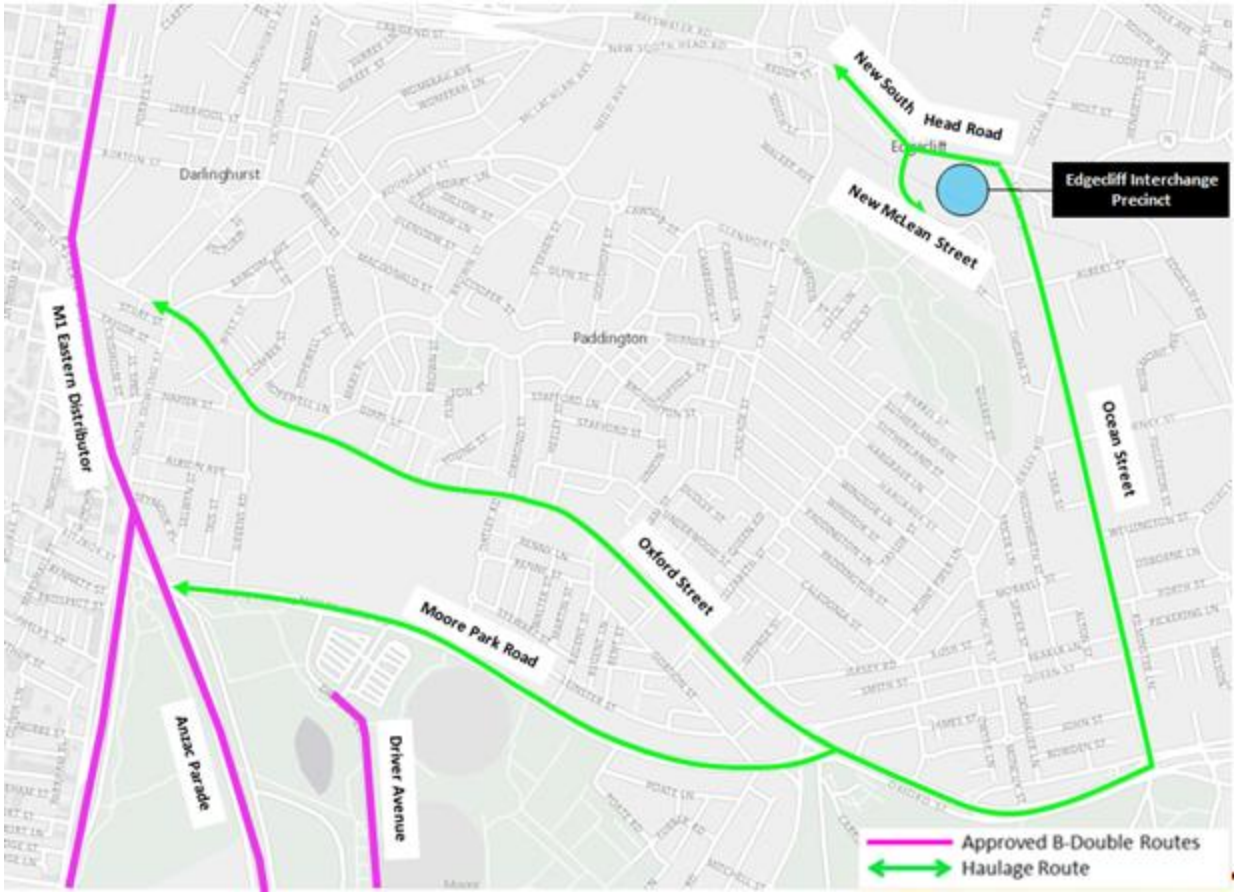

Figure 19 Proposed haulage routes (indicative only, subject to detailed design)

Approved routes for 4.6 metre high vehicles are present south of the Cleveland Street intersection with Anzac Parade. As a result, it is anticipated that vehicles with heights of 4.6 metres or greater would travel via Driver Avenue to avoid potential issues with height restrictions.

It is expected that minimal light and heavy vehicles are likely to be generated during construction. The size of vehicles used for haulage would be consistent with the access route constraints, safety and any worksite constraints. Some construction may require truck and trailer combinations or semi-trailers. Access arrangements for these vehicles would be defined in the CTMP.

Parking

The operation of a number of on-street and off-street parking facilities would be affected during the construction of the Proposal. Current construction information indicates key parking areas impacted include:

- 12 Medical Centre staff car parking spaces on the level 2 car park level, north of the motor room
- three public car parking spaces on the level 2 car park during construction of Lift 2
- up to five short term parking spaces (1P) on New McLean Street, south of the ramp.

During various stages of construction, these affected car parking spaces are expected to be used as site compounds and would not be available for parking. As a result, there may be a temporary loss of on-street and off-street parking during construction, which would have a minor increase in the demand for parking within the local network in the short term.

The impact on parking demand would need to be discussed and confirmed with Eastpoint Food Fair to manage potential impacts.

Construction workers would be encouraged to car-pool or use adjacent public transport services. However, it is expected a portion of workers would travel via private vehicles which may also marginally increase the demand for on-street parking within the surrounding local streets. The CTMP would be prepared to manage the impacts of construction traffic parking.

Taxi and kiss and ride facilities

There is currently no formal kiss and ride zones provided near the Edgecliff Interchange Precinct. However, it has been observed that informal kiss and ride activity occurs near the precinct entrances at New South Head Road and New McLean Street. The temporary diversion on New McLean Street entrance during construction may impact the informal kiss and ride activity on New McLean Street, which may relocate to New South Head Road.

There would be no impacts to the taxis with the taxi zone remaining accessible during the construction phase.

Bus facilities

Bus services using the bus interchange above Eastpoint Food Fair would be impacted during construction. At the bus interchange level, construction activities include the installation of Lift 2 and other pedestrian facilities.

For the period of construction, a storage compound is required at the bus interchange level to construct the proposed upgrades and facilitate unloading of construction material.

To avoid closing the bus interchange, temporary bus diversions are likely to occur during the staged construction of the pedestrian crossing and the extension of the canopy. This would require one bus rank, lane and associated bus stands within the bus interchange to be closed to complete the associated construction works before moving onto the next bus rank.

During construction, key impacts on bus operations at the bus interchange level would include:

- potential congestion at the bus interchange due to the reduced operational and circulation areas for buses and passenger pick-up and set-down
- confusion among bus customers as a result of relocation of bus stands and access arrangements
- conflicts between buses and construction related vehicles accessing the compound site on the bus interchange level.

Any diversions or changes to bus services, or temporary relocation of bus stops, would be undertaken in consultation with bus service operators and would be adequately sign-posted with appropriate community notification of any changes, to ensure that bus passengers are fully informed of these changes. This would include advance notification via signage, web updates and other communication channels.

Bicycle network and facilities

During construction works, the marked on-road bicycle lane close to the New McLean Street entrance may need to be closed temporarily to facilitate the installation of the new ramp and other construction activities. Cyclists would still be able to use New McLean Street to link to other nearby cycle routes.

The proposed site compound on the bus interchange level would require the northern stairs to be closed off and would provide a single lane for cyclists to egress from the bicycle cage located at the bus interchange level. The closure of the stairs would require cyclists to use other available stairs. The amount of cyclists likely to be impacted is expected to be minimal.

The relocation of the bicycle cage on the bus interchange would impact the availability of bicycle storage facilities for the interchange precinct. Temporary facilities should be provided to minimise the temporary loss of these facilities where possible.

Pedestrian facilities

Construction works would be undertaken to ensure pedestrian access to and through the precinct would be maintained. Where works are carried out that may potentially disrupt the existing pedestrian facilities, appropriate signs or traffic controllers would be positioned to notify pedestrians of the temporary arrangements.

Proposed works that are expected to cause temporary disruptions to the existing pedestrian facilities surrounding the station have the potential for increased safety risks for pedestrians, due to potential interactions with construction vehicles. As a result, there may be minor diversions in these locations that would be appropriately signposted to notify pedestrians of the temporary arrangements. Any interaction between construction vehicles and pedestrians and cyclists would be managed and controlled by traffic controllers. Impacts to pedestrians during construction would be managed through the development of a CTMP.

Pedestrian movements along the station platform would be impacted during the staged replacement of the escalators and the construction of the fire stairs at platform level. The replacement of escalators would temporarily increase the walking distances for rail customers along the platform, requiring pedestrians to walk to an operating escalator or to the lift that is operational. The reduced space on the platform may increase pedestrian congestion and reduce the amount of standing area for customers. Appropriate signage would be provided to mitigate any potential impacts to pedestrian movements on the platform.

During the construction of the lifts, a work zone would need to be closed off temporarily on each level the lift passes through. The proposed site compound on the bus interchange level would require the northern stairs to be closed off. The closure of the stairs would require pedestrians to use other available stairs. The amount of pedestrians likely to be impacted is expected to be minimal.

Mitigation measures would be subject to further consideration during detailed design and construction planning in consultation with the relevant authorities. Notification of changes to pedestrian access would be provided to the community.

Property access

During construction, there is potential for temporary disruptions to access for residents and businesses along New McLean Street. However, property access would be maintained at all times, and any impacts would be short-term. In such instances, affected occupants would be notified in advance of the scheduled works. Access to all properties would be maintained during construction unless agreed with the property owner/s in advance.

b) Operational phase

It is considered that the Proposal would not have significant impacts on bus or rail operations and would likely bring about positive impacts in terms of contributing towards making railway transport more accessible to the community. A summary of the operational traffic, transport and access impacts is outlined below.

Customer and public access

The Proposal would provide equitable access to Edgecliff Station for customers with reduced mobility and parents/carers with prams. The Proposal would improve facilities and offer significant benefits to pedestrians, including:

- installation of two new lifts to provide an accessible path of travel between the paid concourse and station platform and between the unpaid concourse and bus interchange

- construction of a compliant pedestrian ramp at the New McLean Street station entrance
- construction of kiss and ride zone on New McLean Street including shelter and seating
- additional wind breaks on the bus islands
- provision of a pedestrian crossing between Lift 2 and bus ranks
- improved wayfinding signage
- provision of TGSIs at the edge of the platform and stair landings.

The Proposal would result in positive impacts in terms of contributing towards making railway transport more accessible to the community, would improve customer experience in the vicinity of the station and has the potential to encourage more customers to walk or cycle to the station by improving interchange facilities.

Road network and traffic

The Proposal would assist in making public transport infrastructure more accessible to rail customers and in providing a seamless transition between transport modes, which would likely increase patronage. It is anticipated that the additional rail patronage would mainly generate walking trips to the station (rather than additional traffic) and the improved kiss and ride facilities would provide formal areas for customer drop-off (reducing potential illegal drop-offs that may impede road traffic movements).

No commuter parking is proposed as part of the Proposal, therefore the increase in future road traffic is expected to be minimal and it is considered that the Proposal would have a negligible impact on traffic in the local road network.

Parking

The Proposal does not provide provisions for a commuter car parking facility, however impacts on two retail car parking spaces to provide Lift 2.

The proposed kiss and ride zone on New McLean Street would result in the loss of approximately five short term (1P) on-street parking.

Overall, the Proposal would result in the loss of five timed on-street parking spaces and two retail parking spaces. This loss would have a minor impact on parking in the local area. It is considered that the positive impacts arising from improved accessibility and upgraded facilities at Edgecliff Station would outweigh the potential negative impacts associated with the loss of timed parking spaces within the precinct.

Taxi and kiss and rise facilities

The Proposal includes the provision of three kiss and ride spaces on New McLean Street, to be located at the existing short term parking zone near the station entrance. This requires realigning the indented kerb to accommodate the compliant ramp, which impacts on the marked on-road cycle lane.

The Proposal would address the informal kiss and ride activity that is currently observed on New McLean Street. The Proposal does not impact on the operation of the existing taxi rank.

Bus facilities

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

The provision of a pedestrian crossing would result in some additional delays to buses as they give way to pedestrian movements between the bus ranks and Lift 2.

The Proposal includes improved interchange facilities and improved pedestrian access to Edgecliff Station, which may increase bus and rail patronage

Bicycle network and facilities

Edgecliff Interchange is classified as a Level A interchange, which requires a minimum of 50 bicycle cage and 20 undercover bicycle rack spaces.

At present Edgecliff Interchange Precinct provides five bicycle racks on New South Head Road and a bicycle cage, which provides 48 bicycle spaces, which would be maintained or relocated. The one bicycle rack on New McLean Street would be removed as a result of upgrades at New McLean Street.

The Proposal includes:

- 10 undercover bicycle spaces on New McLean Street
- relocation of the bicycle cage (48 bicycle spaces) to improve pedestrian movements between Lift 2 and the bus ranks within the bus interchange
- retaining the 10 bicycle spaces on New South Head Road.

In total, there would be capacity for 68 bicycles, which is just under the storage requirements for the interchange precinct of 70 spaces, however is in line with the objectives of the NSW Government's Bike and Ride initiative as identified in *Sydney's Cycling Future*, which encourages improved cycling facilities at transport interchanges and better integrating bicycle riding with other modes of transport.

The provision of a kiss and ride zone and compliant ramp at New McLean Street would impact the on-street cycle lane near the pedestrian crossing; however New McLean Street would still function as an on-street cycle route.

The introduction of additional bicycle storage facilities in the vicinity of the station is likely to encourage active transport as a mode of access to the station precinct.

Pedestrian facilities

The Proposal would improve facilities and offer significant benefits to pedestrians, including:

- installation of two new lifts to provide an accessible path of travel between the paid concourse level and station platform (Lift 1) and unpaid concourse level and bus interchange (Lift 2)
- installation of a pedestrian crossing between Lift 2 and the bus ranks at the bus interchange
- installation of additional wind breaks
- upgrades to the New McLean Station entrance with the provision of a compliant ramp.

The Proposal includes upgrades that would improve pedestrian facilities and offer significant benefits to pedestrians. This would improve the user experience in the vicinity of the station and has the potential to encourage more customers to walk to the station.

Property access

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

6.1.3 Mitigation measures

A CTMP would be prepared by the Contractor in consultation with TfNSW and provided to Woollahra Council. The CTMP would be the primary tool to manage potential traffic and pedestrian impacts associated with construction. At a minimum, the CTMP would include:

- procedures for preparing and implementing Traffic Control Plans (TCPs) for any detours or traffic controls to manage temporary road disruptions
- final construction traffic access routes, site compound(s), contractor parking and loading zones
- access routes to and from the local road network
- scheduling of works/deliveries to avoid peak commuter and school times and limiting works in the road carriageway as much as practicable to limit parking losses and maintain customer access to the station
- measures to:
  - limit temporary parking losses
  - maintain customer access to and from the station
  - maintain private property access unless otherwise agreed
  - identify changed traffic/pedestrian conditions including details of construction signage including signposts and variable message signs, traffic controllers and other community notifications.
- A detailed construction impact assessment would be undertaken when further construction details, including access locations and staging are known as part of the CTMP.

Refer to Table 23 in Section 7.2 for a full list of proposed mitigation measures. All mitigation measures are to be incorporated into the CEMP.

6.2 Urban design, landscape and visual amenity

6.2.1 Existing environment

Land use surrounding Edgecliff Station comprises a mixture of medium to high density residential, commercial, recreational and residential zones. The station is positioned beneath Eastpoint Food Fair and Edgecliff Centre, providing retail, business and community services. The adjoining areas are characterised by a combination of primarily medium and high density residential dwellings as well as public recreation areas.

Residents on New McLean Street and within the Eastpoint residential tower have views of the New McLean Street ramp and entrance to the station and the bus interchange, respectively. New McLean Street consists of on street parking, a taxi rank and planted street trees. Several trees within a landscaped garden bed are also visible to the residents. Eastpoint tower (80 Ocean Street) stands adjacent to the existing bus interchange. The bus interchange is visible to residents residing in the western side of the building.

6.2.2 Potential impacts

a) Construction phase

Temporary elements likely to be introduced into the visual environment during the construction period include:

- fencing and hoarding
- road barriers and signage
- construction equipment/plant
- construction compounds, site offices and amenities.

Works are anticipated to be undertaken mainly during standard construction hours, however where night works are required for the Proposal this would involve the use of temporary lighting for operational, safety and security purposes. Lighting installations would be placed to avoid light spill to adjoining road corridors and residential areas.

Works on New McLean Street (including new kiss and ride, compliant ramp, shelter and seating) would be visible in the immediate vicinity of the works and by the New McLean Street residents.

Bus interchange works would be visible by residents of the adjacent 14 storey Eastpoint residential tower.

b) Operational phase

The external visual impacts of the Proposal during the operational phase would be limited to the residents of New McLean Street and Eastpoint tower. The Proposal would result in low and moderate internal visual impacts.

New McLean Street

The impact of the Proposal on the residents of New McLean Street would be moderate due to the removal of the landscaped garden bed containing 12 trees to accommodate the ramp to the station entrance. The new access ramp would be visually accessible resulting in improved wayfinding surrounding the station.

Eastpoint tower

The visual impact on the residents of the Eastpoint residential tower would be low and confined to the new pedestrian walkway at the bus interchange.

Concourse

The visual impact of the Proposal on the concourse would be low and limited to the installation of the lifts and reconfigurations of existing structures including:

- the relocation of the existing ticket gates
- installation of the new customer service hub
- replacement of both the eastern and western sets of platform escalators.

Platform

Sections of the original blue tiled wall would be removed to allow for passing bays and the new fire stairs on the platform. The loss of the tiles would result in a moderate visual impact. The introduction of passing bays would improve circulation providing less congestion for passengers on the platform and improving the visual aspect. The introduction of lifts would have a minimal visual impact.

Bus interchange

The visual impact of the Proposal on the bus interchange would be low and confined to the new pedestrian walkway, relocated bike cage and the lift to the concourse.

6.2.3 Mitigation measures

The overall visual impacts of the Proposal range from low to moderate for the surrounding visual receiver locations. The following mitigation measures would be considered during design development and construction planning to minimise the level of visual impact of the construction and operation phases of the Proposal:

- design new elements to achieve an architectural character that is complementary to existing elements rather than contrasting

- design lighting to minimise upward spread of light near to and above the ramp and bus interchange facilities. Care should be taken when selecting luminaires to ensure that light spill and glare are kept to a minimum
- design street furniture to consider Woollahra Council guidelines, as relevant.

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

Refer to Table 23 in Section 7.2 for a full list of proposed mitigation measures.

6.3 Noise and vibration

A Noise and Vibration Impact Assessment has been prepared by AECOM Australia Pty Ltd (AECOM 2017b). Nearby noise and vibration sensitive receivers were identified and unattended noise measurements were completed to characterise the existing noise environment. The measured noise levels were used to establish construction noise management levels. The main findings of the assessment are discussed below.

6.3.1 Existing environment

Edgecliff Station is located at the intersection of New South Head Road and Ocean Street. A mix of residential, commercial and retail receivers surround the station. A number of retail and medical spaces are located within the station building. A multi-storey residential building is located above the eastern side of the station building.

Background noise levels

Three residential receivers and six non-residential receivers were selected to represent the potential noise impacts from the Proposal. The residential receivers are expected to be the most impacted by noise from the works and are listed in Table 8 and plotted on Figure 20.

Table 8 Representative receivers

Receiver	Name/Address	Classification	Distance to Proposal (metres)
R1	172 - 180 New South Head Road, Edgecliff	Residential	33
R2	180 Ocean Street, Edgecliff	Residential	25
R3	27 Cameron Street, Edgecliff	Residential	50
R4	Aldi – Concourse	Retail	-
R5	Newsagency - Concourse	Retail	-
R6	Precise Dental Surgery - Concourse	Medical	-
R7	Shopping Centre - Gallery level	Retail	-
R8	Edgecliff Medical Centre – Gallery level	Medical	-
R9	Ascham School	School	60

To assist in determining noise criteria for the receivers surrounding the Proposal, two noise catchment areas (NCA) were identified. The noise environment at each of the residential receivers within each NCA is considered to be comparable. The locations of the residential receivers and the two NCAs are shown in Figure 20.

Figure 20 Residential receiver locations and noise catchment areas (NCA)

Long-term unattended noise monitoring was conducted at two locations between 15 September 2017 and 22 September 2017. One noise logger was placed within each NCA. The noise loggers were calibrated prior to and after the monitoring period with a drift in calibration not exceeding ± 0.5 dB(A).

Monitoring determined that the existing noise environment of NCA 1 is characterised by constant road traffic noise during all periods of the day. NCA 2 is characterised by local traffic noise and constant background noise from New South Head Road during all periods of the day. The acoustic environment of both NCAs is typical of an urban environment. A summary of the existing background noise during the day, evening and night for both NCAs is provided in Table 9

Table 9 Existing background and ambient noise levels (dB(A))

Location	Period[1]	Measurement Parameter (dBA)	
		Rating Background Level (RBL) (L_{A90})[2]	Ambient noise levels (L_{Aeq})[3]
NCA1	Day	64	70
	Evening	56	69

Location	Period[1]	Measurement Parameter (dBA)	
	Night	41	65
NCA2	Day	52	62
	Evening	46	57
	Night	43	52

Notes:

1. *Day is defined as 7:00 am to 6:00 pm, Monday to Saturday and 8:00 am to 6:00 pm Sundays & Public Holidays. Evening is defined as 6:00 pm to 10:00 pm, Monday to Sunday & Public Holidays. Night is defined as 10:00 pm to 7:00 am, Monday to Saturday and 10:00 pm to 8:00 am Sundays & Public Holidays.*
2. *The rating background level (RBL) (L_{A90}) represents the noise level exceeded for 90 per cent of the monitoring period.*
3. *The ambient noise level represents the average noise level over the monitoring period.*

Construction noise criteria

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

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

Noise management levels (NMLs) have been determined for receivers in accordance with the ICNG. The ICNG outlines NMLs for non-residential receivers such as commercial properties, schools and places of worship. NMLs for residential receivers are calculated based on the rating background level (RBL) + 10 dB(A) (for daytime periods) or the RBL + 5 dB(A) (for evening and night time periods). A 'highly noise affected level' of 75 dB(A) for residential receivers represents the point above which there may be strong community reaction to noise.

The construction NMLs developed for the Proposal for residential receivers are listed in Table 10.

Table 10 Construction NMLs for residential receivers

Location	Period	RBL (L_{A90})	Standard hours NMLs ($L_{Aeq, 15min}$)	Out of hours NMLs ($L_{Aeq, 15min}$)
NCA1	Day	64	74	69
	Evening	56	N/A	61
	Night	41	N/A	46
NCA2	Day	52	62	57
	Evening	46	N/A	51
	Night	43	N/A	48

The noise management levels applicable to other noise sensitive receivers such as educational facilities, places of worship and commercial receivers as recommended by the ICNG are listed in Table 11. Hotels have been considered as a residential land use rather than a commercial land use. This provides a conservative assumption as the residential NML is more stringent than that which would be applied to a commercial receiver.

Table 11 Construction NMLs for non-residential receivers

Land Use	NMLs ($L_{Aeq, 15min}$) (applies when properties are in use)	
	External noise level (dBA)	Internal noise level (dBA)
Commercial Premises (including offices, retail outlets)	70	60
Medical	55	45

Sleep disturbance noise goals have also been established for residential receivers which are based on the *NSW Roads Noise Policy* (Department of Environment, Climate Change and Water, 2011). Based on the Policy, the sleep disturbance criteria for both NCA are a screening level of 50-55 dB(A) $L_{A1(1\ minute)}$ and an awakening reaction at 60 to 65 dB(A) $L_{A1(1\ minute)}$.

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

Based on the measured background noise levels during the night, the sleep disturbance criteria for the nearest noise sensitive residential receivers are listed in Table 12.

Table 12 Sleep disturbance criteria

Location	Background noise level (L_{A90}), dB(A)	Sleep disturbance screening level ($L_{A1(1\ minute)}$, dB(A)	Awakening reaction $L_{A1(1\ minute)}$, dB(A)
NCA 1	41	56	65
NCA 2	43	58	65

Construction vibration criteria

When assessing vibration there are two categories of vibration criteria: one related to the impact of vibration to human comfort and one relating to the impact on building structures (cosmetic damage).

Human Comfort

The assessment of intermittent vibration outlined in the NSW EPA guideline A*ssessing Vibration: A Technical Guideline* (AVTG) is based on Vibration Dose Values (VDVs). Maximum and preferred VDVs for intermittent vibration arising from construction activities are listed in Table 13. The VDV criteria are based on the likelihood that a person would comment adversely on the level of vibration over the entire assessment period.

Table 13 Preferred maximum vibration dose values for intermittent vibration for human comfort ($m/s^{1.75}$)

Location	Daytime[3] Preferred	Daytime Max	Night time[4] Preferred	Night time Max
Critical areas[1]	0.1	0.2	0.1	0.2
Residences	0.2	0.4	0.13	0.26
Offices, schools, educational institutions and places of worship	0.4	0.8	0.4	0.8
Workshops[2]	0.8	1.6	0.8	1.6

Notes:

1. *Examples include hospital operating theatres and precision laboratories where sensitive operations are occurring. Places where sensitive equipment is stored or delicate tasks are undertaken require more stringent criteria than the residential criteria specified above*
2. *Examples include automotive repair shops, manufacturing or recycling facilities. This includes places where manufacturing, recycling or repair activities are undertaken but do not require sensitive or delicate tasks.*
3. *Daytime period is defined as 7am – 10pm under BS 6472-1992 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)*
4. *Night period is defined as 10pm – 7am under BS 6472-1992.*

Structural damage to buildings

There is currently no Australian Standard that provides guidance for assessing cosmetic building damage caused by vibration. However, the German standard (DIN 4150) provides recommended maximum levels of vibration that reduce the likelihood of building damage caused by vibration and are presented in Table 14. DIN 4150 states that buildings exposed to higher levels of vibration than recommended limits would not necessarily result in damage. The vibration criteria provided in Table 14 would be adopted for the management of vibration impacts on structures and include more conservative values for heritage structures.

Table 14 DIN 4150: Structural damage safe limits for building vibration velocity

Group	Type of Structure	At foundation – less than 10 Hz	At foundation – 10 Hz to 50 Hz	At foundation – 50 Hz to 100 Hz	At the horizontal plane of the highest floor – all frequencies[1]
1	Buildings used for commercial purposes, industrial buildings and buildings of similar design	20 mm/s	20 to 40 mm/s	40 to 50 mm/s	40 mm/s
2	Dwellings and buildings of similar design and/or use	5 mm/s	5 to 15 mm/s	15 to 20 mm/s	15 mm/s
3	Structures that because of their particular sensitivity to vibration, do not correspond to those listed in Lines 1 or 2 and have intrinsic value (e.g. heritage listed buildings)	3 mm/s	3 to 8 mm/s	8 to 10 mm/s	8 mm/s

6.3.2 Potential impacts

a) Construction phase

Noise

To assess the potential noise impacts from the proposed construction works, the construction phases described in chapter 3 were further divided into the indicative scenarios listed in Table 15. The construction stages highlighted in **bold** are those scenarios that represent the worst case scenarios for noise impacts based on sound power levels for each scenario. The sound power levels are typical values taken from data provided in Australian Standard AS2436-2010, *Guide to noise and vibration control on construction, demolition, and maintenance sites* and the UK Department for Environment, Food and Rural Affairs (DEFRA) *Update of noise database for prediction of noise construction and open sites*. These worst case scenarios have been modelled to determine predicted construction noise levels at representative receivers

Table 15 Construction assessment scenarios

Scenario	Activity	Timing
1A - Establishment of main site compound	Main site compound to be located at Bus interchange level, to the west. Activities include erecting fencing, deliveries of site cabins and offices, welfare facilities, service connections and a material storage area. Works requiring service connections and critical isolations on nights.	Standard hours and night works
1B - Establishment of site hoardings and work zones	Erect site hoarding around the different work fronts at Edgecliff Station, as per proposed site hoarding layout. Installation of temporary construction lights and power where required.	Standard hours and night works
2A - Platform demolition works	Demolition of existing platform slab, removal of slab infill, demolition of platform foundations/rock base to make space for the Lift 1 pit.	Standard hours, night works and weekends
2B - Lift pit concrete works	Installation of waterproofing (as required), reinforcement, formwork and concrete to form the Lift 1 pit on the platform.	Standard hours, night works and weekends
2C - Penetrations through floor slabs	**Local demolition of floor slabs to make space for the new Lift 1 shaft from Platform to Concourse level (3 penetrations). Installation of trimming steel to the underside of the slabs before demolition.**	**Standard hours, night works and weekends**
2D - Erection of glass and steel shaft		Standard hours and night deliveries
2E - Lift Installation and commissioning		Standard hours and night deliveries
2F - Architectural fit-out around lift shaft	Make good architectural finishes around lift shaft – reinstate ceiling finishes, make good tiling and floor finishes.	Standard hours
3A - Penetrations through floor slabs	**Local demolition of floor slabs to make space for the new Lift 1 shaft from Platform to Concourse level (3 penetrations). Installation of trimming steel to the underside of the slabs before demolition.**	**Standard hours and night works**
3B - Erection of glass and steel shafts		Standard hours and night deliveries
3C - Lift Installation		Standard hours and night

Scenario	Activity	Timing
and commissioning		deliveries
3D - Architectural fit-out around lift shaft	Make good architectural finishes around lift shaft – reinstate ceiling finishes, make good tiling and floor finishes.	Standard hours
4A - Demolition of existing escalators and motors	**Piecemeal demolition of motors and truss by cutting them in small manageable pieces to take off site. New door openings in escalator motor rooms to facilitate logistics.**	**Standard hours and night works**
4B - Demolition of top and bottom landings to suit new escalators	Demolition of floor finishes and concrete slabs at top and bottom landings of the escalators to make space for the new machines.	Standard hours and night works
4C - New concrete structural supports	FRP works for the construction of new concrete bearings for the new Edgecliff Station escalators at the top and bottom landings (Concourse and platform levels).	Standard hours, night works and weekends
4D - New steel structural supports	Weld new intermediate steel supports for the new escalators.	Standard hours
4E - Fit-out of escalator void and landings	Make good architectural finishes around the escalators – reinstate ceiling finishes, make good tiling and floor finishes, re-paint and render exposed/damaged walls.	Standard hours
4F - Erection of temporary works for the installation of new escalators	Installation of a guiderail and trolley system to pull sections up the escalator void from the platforms. Fix guiderail system to the floor, bolt system together. Install gantries and/or jacking stations at top and bottom of void to allow loading and unloading of escalator units on the rails.	Standard hours and night deliveries
4G - Installation of new escalators	Deliveries of escalator sections via hi-rail to the platforms, and use of temporary works system to pull the sections up the escalator void to splice them and fix them into place.	Standard hours, weekends and night deliveries
4H - Commissioning of new escalators	Fit-out of steps and cladding panels, fine tuning of escalators mechanical elements, final adjustments and positioning of the escalators using hydraulic jacks.	Standard hours and night deliveries
5A - Penetrations through floor slabs	**Local demolition of floor slabs to make space for the new staircase from Platform to Concourse level (3 penetrations). Installation of trimming steel to the underside of the slabs before demolition.**	**Standard hours, night works and weekends**
5B - Erect walls and build stairs	Build peripheral walls and concrete staircases using block work and concrete, including reinforcement, formwork and concrete pouring.	Standard hours and night works
5C - Fit-out of new stairs	Paint walls and floors, install stair nosing, fit-out lights, power points, speakers, CCTV, sprinklers, fire detection, handrails, balustrades and doors.	Standard hours
6A - Removal of clashing vegetation	**Remove any trees and vegetation clashing with new ramps.**	**Standard hours**
6B - Install foundations and pre-cast concrete ramps	Install pre-cast concrete ramp during a weekend closure of the New South Head Road entrance to the station to limit disturbance.	Standard hours and weekend works
7A - Remove existing gate line and move/install new gates – weekend shutdown	Remove gate lines to be shifted from Concourse floor, move them to new location and install new additional gates. Test and commission gates ready for public use after the weekend shutdown.	Standard hours and weekend works

Scenario	Activity	Timing
7B - Floor finishes around new and old gate line	**Complete architectural fit-out and make good works at previous gate line location and around newly installed gates.**	**Standard hours and weekend Works**
8A - Pedestrian/wheelchair crossings levelling works	**Raise the level of pedestrian crossings across the bus interchange to create a level access for wheelchair from the bus interchange to Lift 2 and the Station. Activity would require closing bus lanes one by one in sequence while works are being completed.**	**Standard hours**
8B - New canopy extension erection	**Erect steel frame and roof sheeting for the new extended canopy over the new levelled wheelchair crossings.**	**Standard hours and night works and weekends**
8C - Bike shed relocation	Disassemble bike cage and re-assemble at new location.	Standard hours
9A - Penetrations	**New penetrations for cables, conduits, cable racks and trays through slabs and walls of Edgecliff Station.**	**Standard hours and night works**
9B - Builders works in relation	New walls and doors to modified electrical switch rooms. Fit-out and finishes in modified electrical rooms.	Standard hours and night works
9C - Electrical works	Works to be undertaken at night or on weekend shutdowns: critical electrical works that require switch overs or isolations of station equipment; delivery of new switch boards via hi-rail; cable pulling across platforms. Electrical works behind hoarding or inside the rooms that do not impact station safety equipment to be undertaken on days.	Standard hours, night works and weekends
10A - Demolition of rooms, doors relocations, platform hub relocation	**Platform level - Demolition of walls and rooms East of Lift 1 to maximise space on platform, change of Low Voltage (LV) switch room door location, move platform hub, Government Radio Network (GRN) relocation.**	**Standard hours and night works and weekends**
10B - Ceilings and walls fit-out to modified platform areas	Ceiling cladding installation, paint walls and floors, install stair nosing, fit-out lights, power points, speakers, CCTV, sprinklers, fire detection.	Standard hours

Construction noise levels at the identified residential and non-residential receivers have been assessed against the standard hours and out-of-hours night-time NMLs (Table 16 and Table 17). During construction not all equipment would be operating simultaneously at all times and in the one location (as assumed in the modelling), which would result in a slight reduction in predicted noise levels. The level of impact may change depending on the final construction methodology which would be developed by the contractor, and further assessment would be undertaken if required.

During work packages 7B and 8B, exceedances of between 10 and 20 dB(A) are predicted at the closest residential receivers. More minor exceedances, less than 10 dB(A), are predicted at residential receivers during work packaged 3A, 4A, 6A, 8A and 9A.

No residential receivers are predicted to be ‘highly affected’ during the work packages.

The non-residential receivers are predicated to experience exceedances of daytime NMLs during standard hours. During work packages 7B and 8B, exceedances of between 10 and 21

dB(A) are predicted. More minor exceedances (less than 10 dB(A)) are anticipated during scenarios 3A, 4A, 6A, 8A and 9A.

The Precise Dental Surgery is predicted to be impacted by exceedances greater than 20 dB(A) during the work packages 3A, 6A, 7B.

The Edgecliff Medical Centre is predicted to be impacted by exceedances greater than 20 dB(A) during the work packages 3A, 7B, 8A.

Key noisy activities during daytime construction works include the use of chainsaws, concrete saws, jack hammers, power saws, tile saws, grinders and core drills.

Table 16 Predicted construction noise levels for each scenario during standard hours for representative receivers (dB(A))

ID	Receiver type	Distance (metres)	NML	2C	3A	5A	6A	7B	8A	10A
R1	Residential	33	74				<40		68	
R2	Residential	25	74				58		73	
R3	Residential	30	62				**69**		**65**	
R4	Non-residential	-	70	69	**81**	69	60	**83**	51	41
R5	Non-residential	-	70	**72**	**80**	**72**	62	**89**	57	46
R6	Non-residential	-	55	**65**	**85**	**65**	**77**	**77**	43	<40
R7	Non-residential	-	70	57	**83**	57	<40	**77**	**78**	<40
R8	Non-residential	-	55	**57**	**83**	**57**	<40	**77**	**78**	<40
R9	Non-residential	60	65	<40	47	46	<40	56	**61**	<40

Notes:

*- Items highlighted in **BOLD BLACK** indicate predicted impact at this receiver during this work stage is above NML.*

Table 17 Predicted construction noise levels for each scenario during out of hours works for residential receivers (dB(A))

ID	Distance (metres)	NML	2C	3A	4A	5A	7B	8B	9A	10A
R1	33	46	46	**54**	**49**	46	**64**	**62**	**49**	<40
R2	25	46	<40	<40	<40	<40	<40	**67**	<40	<40
R3	30	48	<40	**52**	<40	<40	48	**59**	<40	<40

Notes:

*- Items highlighted in **BOLD BLACK** indicate predicted impact at this receiver during this work stage is above NML.*

Current noise modelling suggests that some works could be undertaken 24 hours a day, 7 days a week without impact. There is a possibility that a selection of activities would be undertaken 24 hours a day, 7 days a week. The activities would be selected based on further assessment of noise impacts once construction methodology has been finalised.

Sleep disturbance

Noise from loud construction activities has the potential to cause sleep disturbance at the nearest residential receivers.

Predicted $L_{A1(1\ min)}$ noise levels listed in Table 18 indicate that the awakening reaction criteria may be exceeded during the night-time construction works during work packages 7B and 8B.

Table 18 Construction LA1 (dB(A)) noise level results for residential receivers

Most Affected Receiver	$L_{A1(1\ minute)}$, dB(A) Awakening reaction	2C	3A	4A	5A	7B	8B	9A	10A
R1	65	54	62	57	54	**72**	**70**	57	48
R2	65	48	48	48	48	48	**75**	48	48
R3	65	48	60	48	48	56	**67**	48	48

Notes:

*- Items highlighted in **BOLD BLACK** indicate predicted impact at this receiver during this work stage is above the awakening reaction criteria.*

Construction activities (particularly those which have a high noise impact) would be undertaken during the daytime where feasible.

The predicted construction noise levels are typically the worst case noise level, therefore the majority of actual noise levels are likely to be less than those predicted. The potential for sleep disturbance would be assessed in more detail following confirmation of the construction methodology by the Contractor and would be subject to additional mitigation measures, if required.

Construction traffic

Construction traffic volumes are anticipated to be:

- 1 skip truck per day
- 2 utes or small vans per day
- 2 construction staff cars per day
- 1-2 heavy vehicle deliveries per day supplying plant and equipment.

In order for construction traffic to generate an increase in noise levels of greater than 2 dB, existing traffic levels along construction traffic routes would need to increase by around 60 per cent.

Based on a Traffic and Transport Impact Assessment prepared by AECOM (AECOM, 2017), additional construction traffic movements would be less than 10 per cent of the existing total daily movements. Therefore, the construction vehicles would have a negligible impact on existing road traffic noise in the area. The traffic generated by the Proposal would be considered to comply with the *Road Noise Policy* criteria.

Vibration

During construction, vibration generating machinery would be required including, jackhammers, hammer drills and bored piling rigs. Construction activities that require the use of this machinery have the potential to create vibration which can disturb nearby sensitive receivers.

Vibration levels have been calculated at the nearest sensitive receivers. The predicted structure-borne noise levels for use of the three types of vibration intensive construction equipment at representative receivers are presented in Table 19.

Regenerated noise (where vibration energy, after travelling through a building then re-radiates as sound energy from large surfaces such as walls, ceilings and floors) levels exceedances between 10 and 20 dB(A) are predicted at the Edgecliff Medical Centre (work packages 2C, 3A, 5A, 7B and 8A) and the Precise Dental Surgery (work package 3A). More minor exceedances (less than 10 dB(A)) are also anticipated during scenarios 2C, 3A, 5A, 7B, 8A and 10A.

Table 19 Predicted regenerated noise levels at selected receivers

Most Affected Receiver	Type	NML, $L_{Aeq\ 15\ min}$ Internal	Predicted structure-borne noise level dB(A)	NML exceed-ance
2C - Lift 1 Penetrations				
180 Ocean Street	Residential	35	<30	-
Aldi - Concourse	Retail	60	52	-
Newsagency - Concourse	Retail	60	64	4
Precise Dental Surgery - Concourse	Medical	45	52	7
Shopping centre Gallery	Retail	60	58	-
Edgecliff Medical Centre - Gallery	Medical	45	58	13
3A - Lift 2 Penetrations				
180 Ocean Street	Residential	35	<30	-
Aldi - Concourse	Retail	60	64	4
Newsagency - Concourse	Retail	60	64	4
Precise Dental Surgery - Concourse	Medical	45	64	19
Shopping Centre Gallery	Retail	60	58	-
Edgecliff Medical Centre - Gallery	Medical	45	58	13
5A - Staircase Penetrations				
180 Ocean Street	Residential	35	<30	-
Aldi – Concourse	Retail	60	52	-
Newsagency - Concourse	Retail	60	64	4
Precise Dental Surgery - Concourse	Medical	45	52	7
Shopping Centre - Gallery	Retail	60	58	-
Edgecliff Medical Centre - Gallery	Medical	45	58	13
7B - Ticket Gate Floor				
180 Ocean Street	Residential	35	<30	-
Aldi - Concourse	Retail	60	52	-
Newsagency - Concourse	Retail	60	64	4
Precise Dental Surgery - Concourse	Medical	45	52	7
Shopping Centre Gallery	Retail	60	58	-
Edgecliff Medical Centre - Gallery	Medical	45	58	13
8A - Bus Interchange Crossing				
180 Ocean Street	Residential	35	<30	-
Aldi - Concourse	Retail	60	53	-
Newsagency - Concourse	Retail	60	53	-
Precise Dental Surgery - Concourse	Medical	45	53	8
Shopping Centre - Gallery	Retail	60	64	4
Edgecliff Medical Centre - Gallery	Medical	45	64	19
10A - Platform Demo				
180 Ocean Street	Residential	35	<30	-
Aldi - Concourse	Retail	60	41	-
Newsagency - Concourse	Retail	60	53	-
Precise Dental Surgery - Concourse	Medical	45	41	-
Shopping Centre -	Retail	60	47	-

Most Affected Receiver	Type	NML, $L_{Aeq\ 15\ min}$ Internal	Predicted structure-borne noise level dB(A)	NML exceed-ance
Gallery				
Edgecliff Medical Centre - Gallery	Medical	45	47	2

Human Comfort

The findings of the Noise and Vibration Impact Assessment (AECOM, 2017b) indicate the Proposal would not result in exceedances of human comfort criteria at nearby receivers. No exceedance of the VDV management level is predicted.

Vibration-intensive works may include the use of the following items of equipment:

- jack hammers
- hammer drills.

The safe working distances of these items of equipment from off-site receivers (based on recommendations of the TfNSW *Construction Noise Strategy* and AECOM's previous project experience) is shown in Table 20. If these safe working distances are complied with, no adverse impacts from vibration intensive works are likely in terms of human response or cosmetic damage. The safe working distance for a hammer drill (hand held) is assumed to be similar to a jack hammer.

Table 20 Safe working distances of vibration intensive equipment to be used during the Project

Plant	Rating/Description	Cosmetic damage – residential/commercial	Cosmetic damage - heritage
Jack hammer	Hand-held	1 m (nominal)	1 m (nominal)

Based on the indicative construction activities assessed for the Proposal, some works may occur within the safe working distances for heritage features. If vibration-intensive works are required within these safe working distances, mitigation measures to control excessive vibration would be implemented.

b) Operational phase

New mechanical plant would be located within the station to support the proposed additions / upgraded station. Additional operation equipment would include two new lifts and the refurbishment of both the eastern and western set of escalators. The operation of the lifts would not result in a substantial increase in noise emissions and the new escalators are likely to be quieter than the existing escalators. As such, the operational noise environment is expected to remain largely unchanged.

Standard noise controls such as appropriate selection of mechanical plant (including lifts) would reduce any impacts. If required, operational noise emissions shall be addressed during the detailed design phase in order to comply with the acceptable noise levels outlined in the Industrial Noise Policy (EPA, 1999).

No vibration impacts associated with the operation of the Proposal are anticipated.

6.3.3 Mitigation measures

During detailed design, further investigation would be undertaken to identify the noise and vibration impacts on the nearest sensitive receivers. In accordance with TfNSW's Construction

Noise Strategy, and in consultation with impacted receivers, feasible and reasonable mitigation measures would be implemented to minimise impacts during construction.

Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the Construction Noise Strategy (TfNSW, 2016a) and the Noise and Vibration Impact Assessment (AECOM, 2017c) and in consultation with impacted receivers.

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

The CNVMP would be supported by the Community Liaison Management Plan to be prepared for the Proposal, which would detail community notification requirements including distribution of notification flyers to stakeholders within a 300 metre radius of the Proposal area.

Refer to Table 23 in Section 7.2 for a full list of proposed mitigation measures. All mitigation measures are to be incorporated into the CEMP.

6.4 Indigenous heritage

6.4.1 Existing environment

A due diligence assessment was undertaken for the Proposal in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (OEH, 2010). An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal (the area around Edgecliff Station) with a 500 metre radial buffer on 24 October 2017. No AHIMS sites were identified in the search.

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

6.4.2 Potential impacts

a) Construction phase

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

- the foundations and pits for the new lift shaft and lift at the proposed lift 1 location would require excavation into soils/fill and shale rock up to a depth of around three metres
- excavation for the construction of a compliant ramp at the New McLean Street station entrance.

Ground disturbing activities have the potential to impact Indigenous sites, if present.

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

b) Operational phase

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

6.4.3 Mitigation measures

If previously unidentified Indigenous objects are uncovered during development, in accordance with TfNSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2016b), work would cease in the vicinity of the find and the TfNSW Project Manager and TfNSW Environment and Planning Manager would be notified immediately to assist in co-ordinating next steps which are likely to involve consultation with an archaeologist, OEH and the Local Aboriginal Land Council/s. If human remains are found, work would cease, the site would be secured and the NSW Police and OEH would be notified.

Refer to Table 23 in Section 7.2 for a full list of proposed mitigation measures. All mitigation measures are to be incorporated into the CEMP.

6.5 Non-Indigenous heritage

A Statement of Heritage Impact (SoHI) was prepared (AECOM, 2017c) to assess potential heritage impacts associated with construction and operation of the Proposal. A summary of the assessment in the SoHI is provided in this section.

6.5.1 Existing environment

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

Listed heritage items

The desktop search identified no items listed on the World, Commonwealth or National Heritage Lists, the Register of the National Estate, State Heritage Register or Woollahra LEP (1995 and 2014) within proximity of the Proposal.

Edgecliff Station Group is listed as a place of local significance on the RailCorp (Sydney Trains) S170 Heritage and Conservation Register as an item of local heritage significance (#4801167). Edgecliff Station (1979) has been assessed as being of local historical, aesthetic, social, research and representative value. It retains many of its original features, and is thought to be more intact than other railway stations of this era (NSW Heritage Division 2009).

Historical background

Edgecliff Station was opened in 1979, more than 60 years after it was initially proposed, and has been in operation since. The station was constructed over two levels – concourse and platforms – and above these was a gallery and bus interchange. The concourse provided shops, ticketing and other facilities, as well as access to the platforms below via banks of escalators. Walls were of aggregate render, with plywood ceilings, and aluminium or stainless steel fixtures on escalators and stairs. Terrazzo flooring and skirting was used on the concourse level, while the platforms were finished with bitumen. Blue decorative tile was used on structural columns, and furniture was either small banks of moulded plastic chairs, or long benches of moulded plywood. The station has undergone numerous updates over the last 35 years, including an upgrade of the bus interchange in 2009, and extensive internal refurbishment in 2010. The layout and many original features, such as the plywood ceilings and decorative tiling, remain intact, but other elements, such as the original benches and

seats, and the bitumen finish on the platforms, have been replaced (NSW Heritage Division, 2009).

Edgecliff Railway Station Group

Edgecliff Railway Station occupies two separate levels; a concourse level with street access, a number of shops and ticket barriers, and a platform level which provides access to the train services. Above these is a gallery level which predominately acts as a transit area between the floors above and below, and a bus interchange on the roof. Currently, each of these levels is accessed via a series of stairs and escalators.

Of these four levels, only those related to the actual train station – the concourse and the platforms – as well as the access ramps and stairs are on the RailCorp (Sydney Trains) S170 Heritage and Conservation Register listing.

Concourse level

The concourse level acts as the main entry for the station, providing pedestrian access from New South Head Road, through the ticket barriers, and down to the rail platforms via two banks of escalators. The western end of the concourse level contains a number of shops and kiosks, while the northern and eastern walls feature a number of offices, plant rooms and public toilets.

The flooring throughout the public areas is the original terrazzo with carborundum strips, and the ceiling is the original moulded plywood. The stairs are also of original terrazzo with carborundum strips, and feature the original anodised aluminium handrails. The escalators are clad in stainless steel, a material that is used for other fixtures and fittings, including ticket barriers, ticket machines and kick boards on doors. The original barrier box remains *in situ*, and is also partly clad in stainless steel, with the curved end of the cladding reflecting the rounded corners of the plywood ceiling and of the box itself. The original ticket windows remain in front of the barrier box, with their wide, rounded surrounds painted blue. The original phone booths remain near the southern entrance to the station, but the formerly tiled and rendered eastern and northern walls outside of the toilets have been clad in stainless steel, a replacement that likely occurred during the 2010 renovations (NSW Heritage Division, 2009). The remainder of the walls are the original aggregate render, with decorative blue tile on structural columns.

Gallery level

The gallery level serves primarily as a conduit between the bus interchange above, and the railway station below, with some waiting and retail areas. The gallery retains its original terrazzo flooring, and possibly the concrete render walls, but timber-finished columns replace the original blue tiled columns, and the plywood ceilings have been replaced with flat panels.

Platform level

The platforms are accessed from the concourse via two banks of stainless steel clad escalators. As with the concourse level, the ceiling above the escalators and above the platform is moulded plywood, and the walls are aggregate render with decorative blue tile on columns. There are also panels of decorative tile at the end of the platform, surrounding the tri-level station name. The decorative tile has been removed in places to install modern services. Platform furniture includes the original, free standing concrete column water fountains, and metal benches that replaced the original plastic. The floor is finished with grey ceramic tile that replaced the original asphalt.

Significance assessment

The Sydney Trains S170 Heritage and Conservation Register contains a significance assessment of Edgecliff Station based on the Heritage Division guidelines (NSW Heritage Office, 2001a).

The assessed significance of the station is provided in Table 21.

Table 21 Edgecliff Railway Station Group statement of significance (NSW Heritage Division, 2009)

SHR criteria	Assessment
Historical significance	Edgecliff Railway Station has historical significance as part of the ESR [Eastern Suburbs Railway], part of the first major railway extension in Sydney since the 1950s.
Historical association significance	No assessment provided.
Aesthetic significance	Edgecliff Station has aesthetic significance through its distinctive 1970s design displayed through its colour schemes, layout and use of materials and remains largely intact as displayed in the bright blue glazed tile columns, the tri-level station name signage, plywood ceilings and long escalators. The station design is a continuation of the earlier 1920s subway design of the city underground in a modern format.
Social significance	The place has the potential to contribute to the local community's sense of place, and can provide a connection to the local community's past.
Technical/Research significance	Edgecliff Station has technical significance for its design features and for the engineering techniques used during its construction.
Rarity	No assessment provided.
Representativeness	Edgecliff Station is representative of 1970s underground station design and layout as one of seven stations completed for the ESR.
Integrity/Intactness	Edgecliff Station retains a number of original features and is largely intact compared to other stations on the ESR.

The Statement of Significance for Edgecliff Station is as follows:

> *Edgecliff Station is of local significance as one of a group of stations that make up the Eastern Suburbs Railway (ESR) line, one of the largest and most contentious post-war rail projects undertaken in the Sydney system. The stations were designed as part of a collection but with individual design and colour styles to differentiate them within it. They represent a continuation of the design principles of the underground system as first displayed in the Museum and St James stations and also represent the latest in construction and design technology at the time.* (NSW Heritage Division, 2009).

Archaeological Heritage

Edgecliff Station was constructed largely underground within an existing urban area and was opened in 1979. Given the past land use surrounding the station, no areas of specific archaeological sensitivity have been identified and no archaeological permits are recommended to be obtained at this stage.

6.5.2 Potential impacts

a) Construction phase

Edgecliff Railway Station Group

The objectives of the Proposal are to improve accessibility and the amenity at Edgecliff Station through a range of upgrade works. The following activities have the potential to directly impact existing heritage elements of the Edgecliff Railway Station Group:

Lifts

The proposed works include the installation of two lifts. Lift 1 would provide access between the concourse and platform levels. On the concourse level, the lift shaft would be located in between the two sets of escalators (Escalator 1 and 2 to the west and Escalator 3 and 4 to the east) that provide access to the station platform. This would require penetration through the terrazzo flooring and underlying concrete, as well as the removal of the plywood ceiling in the vicinity of the lift. There may also be some impact to the tiled column adjacent to the proposed concourse lift location, and some alterations to internal walls to create a secondary egress route.

On the platform level, the shaft for lift 1 would be installed in the middle of the platform, between the escalator structures. This would require penetration through the concrete floor of the level above, and through the plywood ceiling, as well as the removal of the seating and floor tiling in this area.

A second lift (lift 2) would be installed at the western end of the concourse to link the station concourse and the bus interchange. This would require penetration through the concourse floor, as well as in the ceiling. While the floor is the original terrazzo at this point, the ceilings are a later, flat sheeting material rather than the original moulded plywood.

Stairs

A new set of fire stairs would be installed next to lift 1, to provide an egress route from the platform to the paid concourse. At the platform level, this stairwell would occupy much of the waiting area between the escalators, and would require the cutting of a hole in the concrete floor of the level above, and through the plywood ceiling, as well as the removal of the seating and floor tiling. On the concourse level, stair installation and egress routes would require the removal of the existing access doors and some sections of wall, and the addition of new walls and new door. These changes would impact on adjacent areas of terrazzo floor and skirting.

Escalators

In order to accommodate the new lift and fire stairs, the current escalators would need to be replaced. The new escalators would be sympathetic to the originals, retaining their aesthetic sense of length. However, these new escalators would require structural alterations to provide the required head height clearance, necessitating the removal of the original plywood ceilings.

Passing bays

Passing bays need to be created on either side of the escalators on the platform level to provide safe access paths for pedestrians, prams, and people in wheelchairs. It is proposed that these bays be created by demolishing part of the walls below the escalators, creating a corridor underneath. This would require the removal of sections of original tiled wall, but would leave the tri-level station signage in place.

Ticket barriers

The ticket barriers would be moved approximately 5m west, requiring the creation of penetrations in the terrazzo floor at the new location, and the patching of existing penetrations in the existing position. The GAC booth, however, would remain in its original location.

Access ramp

The current ramp and balustrade accessing New McLean Street would be retained, but a new accessible entry ramp and stair meeting compliance standards would be built partially over the existing structure. Trees would need to be removed to facilitate this work, but no change is proposed to the existing ramp providing access from New South Head Road.

Ancillary works

In addition to the main refurbishment works, there are a range of minor ancillary or enabling works proposed for the station. These include electrical and lighting upgrades on the platform

which would require the temporary removal of original ceiling panels, and the relocation of CCTV and wayfinding signage that would require additional penetrations in the floors and walls at the new location, and the patching of existing penetrations in the existing position.

Temporary structures including construction compounds and laydown areas would also be required on the platform, at the location of the phone booths, and outside New McLean Street access ramp.

There is no known moveable heritage at Edgecliff Station and therefore no impacts to moveable heritage are anticipated.

Heritage significance

In summary, the Proposal is required for station facilities to comply with key requirements of the DSAPT and DDA. Current access to the platforms and bus interchange is hindered, with escalators and/or stairs being the only method of gaining access to the platform level and bus interchange from the station concourse. The lack of ramp or lift access do not facilitate access for users of any wheeled vehicles (including luggage) and people with reduced stamina and mobility issues.

The proposed works would impact on some of the main heritage features of the station, requiring substantial alterations to the plywood ceilings and terrazzo floors to allow for the insertion of the two lift shafts and the new escalators. The creation of the passing bays would also require the demolition of sections of the original tiled wall, and the construction of both the fire stairs and Lift 1 would substantially alter the overall layout and appearance of the platform.

The Proposal has the potential to positively impact on the social significance of the station through provision of equitable access to and from the station and across the railway.

The temporary enabling works, services and landscaping would have no long-term impacts on the assessed heritage significance of the station.

Archaeological heritage

No areas of specific archaeological sensitivity have been identified and no archaeological permits are recommended to be obtained at this stage.

There is potential for encountering general historic items during activities such as excavation within the rail corridor. In the event of uncovering any unknown heritage items TfNSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2016b) would be implemented. The Heritage Council must be notified of the discovery of a relic under Section 146 of the Heritage Act.

b) Operational phase

The Proposal would substantially alter the overall layout and appearance of the station. The installation of the lifts, new escalators, fire stairs and pedestrian passing bays would have permanent visual impacts on heritage setting of the station. These heritage impacts would be offset through the retention of key heritage elements of the station including the wall tiles, terrazzo floor, plywood ceiling, barrier box and tri-level sign, the salvage and re-use of original fabric where possible and the use of sympathetic alternatives. These heritage impacts would also be offset by the long term benefits of improving accessibility at Edgecliff Station.

6.5.3 Mitigation measures

A number of mitigation measures would be implemented during detailed design and construction of the Proposal to avoid and/or minimise heritage impacts.

The detailed design and construction of the Proposal would be undertaken with consideration of the heritage values of the station. In order to minimise impacts to significant fabric and the heritage setting of the station, the following mitigation measures such as the following would be implemented:

- During detailed design, consideration would be given to referencing the 1970s aesthetic, including the moulder plywood ceilings and the terrazzo flooring, maintaining ceiling patterns around lift shafts, reducing the visual impacts of the fire stairs, demolition of the tiling and salvaging and incorporating material where feasible.
- A suitably qualified heritage consultant would be engaged to guide the detailed design and construction to ensure heritage impacts are appropriately managed and resolved, in consultation with TfNSW.
- The Construction Management Plan should identify significant fabric (plywood ceilings, terrazzo floors and areas of blue tile), and measures to preserve these elements during construction. This should include the careful removal of plywood panels around lift shafts (for future reinstatement), and installation of protective paper or matting to floors and walls around areas of work, as required. This should be undertaken in consultation with a suitability qualified heritage consultant.
- As the station is listed on Sydney Trains Section 170 Heritage and Conservation Register, Sydney Trains will need to be consulted.
- Archival photographic recording of the station as a whole prior to the commencement of construction following NSW Heritage Division guidelines *Photographic recording of heritage items using film or digital capture* (NSW Heritage Office, 2006). Copies should be provided to TfNSW, and the local library for future reference.
- A heritage induction would be provided to all on-site staff and contractors involved in the project. The induction would clearly describe the heritage constraints of the site.
- In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in TfNSW's Unexpected Heritage Finds Guideline (TfNSW, 2016b) would be followed.

Refer to Table 23 in Section 7.2 for a full list of proposed mitigation measures.

6.6 Socio-economic impacts

6.6.1 Existing environment

Land use surrounding Edgecliff Station comprises a mixture of medium to high density residential, commercial, recreational and residential zones. The station is positioned beneath Eastpoint Food Fair and Edgecliff Centre, providing retail, business and community services. The adjoining areas are characterised by a combination of primarily medium and high density residential dwellings as well as public recreation areas.

Sensitive receivers in the vicinity of Edgecliff Station consist of:

- a number of commercial and retail spaces associated with the neighbourhood town centre located on New South Head Road west of the junction with Ocean Street, and on Ocean Street south of the junction with New South Head Road
- commercial and retail shops within the Edgecliff Centre and Eastpoint Food Fair
- residents of multi-unit dwellings on New McLean Street, including odd numbers 27-35
- residents of semi-detached dwellings on Arthur Street, consisting of numbers 2, 4, 8, 14 and 18

- residents and small-business operators on the north side of New South Head Road, including even numbers 136 – 216.

A review of the 2016 Australian Bureau of Statistics (ABS) Census data was undertaken for Edgecliff. The suburb of Edgecliff has a population of 2,580 people with a median age of 38 years. 53.3 per cent of the people living in Edgecliff were born in Australia and 70 percent of the people who reported being in the labour force were in full time employment. The most common method of travel to work for employed people was by train (41.5 per cent).

Station barrier counts show that Edgecliff is the 35th busiest station on the Sydney Trains network, with an average weekday patronage of 14,100 trips recorded in 2014.

6.6.2 Potential impacts

a) Construction phase

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

- temporary changes to vehicular, bus, bicycle and pedestrian access to, through and movements around the station
- temporary changes to escalator use through staged relocation and replacement works
- temporary impacts to local traffic movements
- temporary loss of parking on New McLean Street and within the retail parking above the station
- increased truck movements delivering materials and equipment and transporting waste
- construction noise, vibration, dust and visual impacts.

Construction works would be undertaken to ensure pedestrian and cyclist access to and through the precinct would be maintained. Where works are carried out that may potentially disrupt the existing pedestrian facilities, appropriate signs or traffic controllers would be positioned to notify pedestrians of the temporary arrangements.

Pedestrian movements along the station platform would be impacted during the staged replacement of the escalators and the construction of the fire stairs at platform level. The replacement of escalators would temporarily increase the walking distances for rail customers along the platform, requiring pedestrians to walk to the operating escalator or to the lift that is operational. The reduced space on the platform may increase pedestrian congestion and reduce the amount of standing area for customers. Appropriate signage would be provided to mitigate any potential impacts to pedestrian movements on the platform.

During construction works, the marked on-road bicycle lane close to the New McLean Street entrance may need to be closed temporarily to facilitate the installation of the new ramp. Cyclists would still be able to use New McLean Street to link to other nearby cycle routes.

During the construction of the lifts, a work zone would need to be closed off temporarily on each level the lift passes through. The proposed site compound on the bus interchange level would require the northern stairs to be closed off and would provide a single lane for cyclists to egress from the bicycle cage located at the bus interchange level. The closure of the stairs would require pedestrians and cyclists to use other available stairs. The amount of pedestrians and cyclists likely to be impacted are expected to be minimal.

The relocation of the bicycle cage on the bus interchange would impact the availability of bicycle storage facilities for the interchange precinct. Temporary facilities would be provided to minimise the temporary loss of these facilities (where possible).

During construction, there is potential for temporary disruptions to access for residents and businesses along New McLean Street. However, property access would be maintained at all times, and any impacts would be short-term. In such instances, affected occupants would be notified in advance of the scheduled works. Access to all properties would be maintained during construction unless agreed with the property owner/s in advance.

The following property matters would require further consideration and consultation with the building Strata Management and relevant strata owner prior to, and during, construction of the Proposal:

- The foundations for Lift 2 would be located in an existing parking area (Level 2 car park). A temporary construction compound would need to be established at this location and long term tenure for the area occupied by the lift shaft for ongoing operation of the lift.
- Fire access doors are required to provide egress from the escalator motor room which is located on the Level 2 car park.
- A new temporary material handling door is required from the escalator motor room (Level 2 car park).
- A temporary construction compound may be required within the Level 2 car park (refer to Section 3.2.7). A licence, lease or easement from either or both of the relevant adjoining strata lot owners would need to be secured prior to the occupation and use of this area.

Consultation with the Strata Management (Owners Corporation) and directly impacted lot strata owners regarding the Proposal and anticipated temporary and long term property impacts has commenced and would continue throughout detailed design and construction.

b) Operational phase

The operation of the Proposal would provide positive socio-economic benefits to the Edgecliff community and the wider Woollahra LGA, including:

- improved accessibility for customers with a new lift (Lift 1) within the paid concourse area to provide compliant access between the paid station concourse and the platform
- improved accessibility for customers with a new lift (Lift 2) outside of the paid concourse area to provide compliant access between the station concourse level and the bus interchange
- improved accessibility for customers entering the Station from New McLean Street through construction of a compliant path from the kiss and ride zone to the concourse level
- provision of warning TGSIs at stairs and ramps
- provision of a formal kiss and ride zone on New McLean Street (3 spaces) with seating and shelter
- additional bicycle facilities close to station entrances.

6.6.3 Mitigation measures

A number of safeguards would be implemented to minimise potential impacts on the community with a particular focus on keeping the community informed. These measures include:

- development of a Community Liaison Management Plan (to be developed by the Contractor prior to construction) to identify potential stakeholders and the best-

practice methods for consultation with these groups during construction. The Plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the Proposal, where possible

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

Refer to Sections 6.1, 6.2 and 6.3 for discussion on the potential traffic/access, visual and acoustic amenity impacts arising from the Proposal and the proposed management strategies.

Refer to Table 23 in Section 7.2 for a full list of proposed mitigation measures. All mitigation measures are to be incorporated into the CEMP.

6.7 Biodiversity

An arboricultural impact assessment was undertaken by EcoLogical Australia (ELA) to identify trees within the site that are likely to be impacted by the Proposal (ELA, 2017a). A site assessment was undertaken on 10 October 2017 by a Level 5 consulting arborist. The subject trees were assessed in accordance with a stage one visual tree assessment (VTA), and practices consistent with modern arboriculture.

A flora and fauna impact assessment was also undertaken by ELA to describe the sites ecological values, including potential habitat for species listed under the *Biodiversity Conservation Act* (BC Act) and/or the *Environment Protection and Biodiversity Act* (EPBC Act). The impact assessment assesses the significance of potential impacts on identified ecological values (ELA, 2017b).

Information about the ecological values of the site and its surrounds was derived from the following sources:

- Edgecliff Station Upgrade Arboricultural Impact Assessment (ELA 2017a)
- NSW Office of Environment and Heritage Atlas of NSW Wildlife
- Commonwealth Department of Environment and Energy Protected Matters Search Tool.

6.7.1 Existing environment

Landscape Context

Edgecliff Station is located within an urban area which has been modified by a long history of disturbances resulting in clearance of native vegetation and replacement by landscaped native and exotic vegetation. Vegetation within the study area consists of a landscaped garden bed on the northern side of New Mclean Street. The vegetation is mapped as ‘Urban Exotic/Native’ with the vegetation structure listed as a ‘landscape feature’ (OEH, 2013). Potential flora and fauna habitats are restricted to the gardens around the periphery of the station.

The largest area of vegetation near Edgecliff Station is Trumper Park, approximately 150 metres to the south.

Threatened species and ecological communities

Ecological Communities

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

Threatened flora species

The database search identified 32 State and 23 Commonwealth listed flora species records within a 5 km radius of Edgecliff Station (ELA, 2017b).

Three of the BC Act listed flora species were recorded in the nearby Trumper Park, namely:

- *Acacia terminalis subspecies terminalis*
- *Doryanthes palmeri*
- *Syzygium paniculatum.*

None of the threatened flora was recorded in the Proposal area and the surrounding landscaped areas do not provide appropriate habitat for threatened flora

Threatened fauna species

The database search identified 32 BC Act and 13 EPBC Act fauna records within a 5 km radius of the site.

Six of these fauna species have a significant probability of occurring in the vicinity of the Proposal:

- *Miniopterus schreibersii oceanensis,* Eastern Bent Wing Bat
- *Myotis macropus,* Southern Myotis
- *Mormopterus norfolkensis,* Eastern Freetail Bat
- *Falsistrellus tasmaniensis,* Eastern False Pipistrelle
- *Pteropus poliocephalus,.* Grey Headed Flying Fox
- *Ninox strenua,* Powerful Owl.

6.7.2 Potential impacts

a) Construction phase

The Proposal would require the removal of 12 trees from a garden bed on the north side of New McLean Street.

Trees requiring removal are identified in Table 22 and shown in Figure 21.

Table 22 Trees to be removed as part of the Proposal

Botanical name	Common name	Status	Number
*Celtis australis**	European nettle tree	Exotic	5
Lophostemon confertus	Brush box	Native - Queensland	2
Eucalyptus tereticornis	Forest Red Gum	Native- Coastal NSW	2
Casuarina glauca	Swamp Oak	Native- Coastal NSW	2

Botanical name	Common name	Status	Number
*Ulmus parvifolia**	Chinese Elm	Exotic	1
TOTAL			**12**

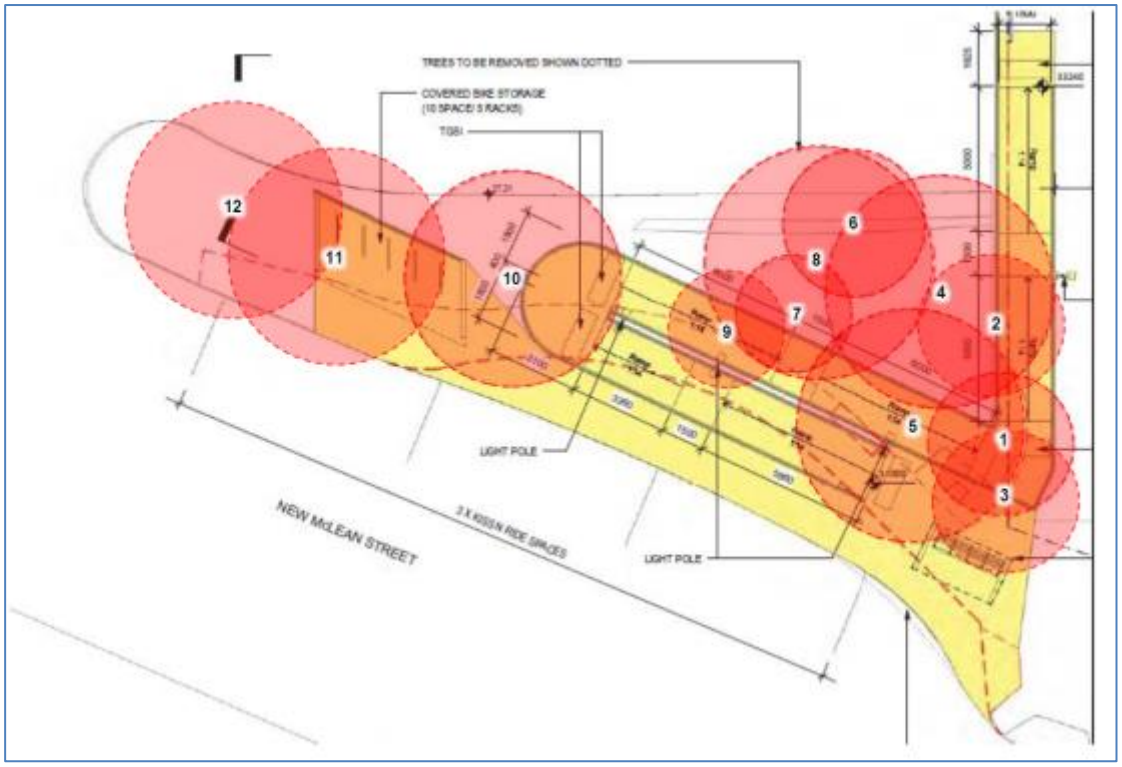

Figure 21 Trees to be removed as part of the Proposal

The trees comprise of two exotic species, one native species (that is outside its natural distribution), and two species that are native to the Sydney basin. None of the tree species are listed as threatened under the BC Act or EPBC Act and none of the species conform in species composition, structure or habitat with an EEC under the BC Act or EPBC Act.

The Ecological assessment concluded that the Proposal including the removal of the 12 trees would have no potential to impact on threatened flora species and no further assessment is required.

Vegetation removal would be undertaken in accordance with TfNSW's Vegetation Management (Protection and Removal) Guideline (TfNSW, 2015a) and TfNSW's Fauna Management Guideline (TfNSW, 2017c).

The Powerful Owl, are regularly observed in the suburbs around Sydney Harbour. They roost in heavily shaded, undisturbed areas and are unlikely to use the area around Edgecliff Station. The Proposal may result in a reduction in the Powerful Owls preferred prey, which includes Ringtail Possum and juvenile Brushtail Possums. Both prey species are abundant in urban areas. The risk of an adverse impact on the wide ranging Powerful Owl is very low and does not warrant further consideration through an assessment of significance.

Assessments of significance were undertaken for the four species of microbats and the Grey Headed Flying Fox (ELA, 2017b). The assessments conclude that the proposed development would not have a significant impact on these species.

A variety of non-threatened fauna may be present in the development footprint. Hollow dependant, common species of native fauna that could be impacted by the removal of the 12

trees include Brushtail Possum, Ringtail Possum, Noisy Miner and Sulphur crested Cockatoo. The implementation of the mitigation measures identified in Section 7.2 would minimise biodiversity impacts generally. On this basis, it is considered unlikely that the Proposal would result in significant adverse impacts to native vegetation and other biodiversity values.

Indirect impacts

Without the implementation of appropriate mitigation measures, there is potential for the proliferation of weed species as a result of construction activities, including species listed as noxious under the Biosecurity Act 2015. Construction activities also have the potential to import new weed species into the Proposal area. During construction, noise, dust, light and contaminant pollution impacts upon biodiversity are predicted to be minimal; however there may be some indirect impacts to fauna species that may use the trees impacted upon by the Proposal area as habitat. Mitigation measures outlined in Section 7.2 would be implemented to minimise direct and indirect impacts on biodiversity.

b) Operational phase

There would be no operational risks to biodiversity as a result of the Proposal.

6.7.3 Mitigation measures

TfNSW has prepared a *Vegetation Offset Guide* (TfNSW, 2016c) to provide a framework for a consistent approach to offsetting impacts to vegetation on applicable TfNSW projects. The guide also allows for appropriate offsets to be provided for one tree or a group of trees that do not form part of a vegetation community, regardless of whether they are native or not.
12 trees have been identified for removal and therefore it is recommended that a minimum of 24 trees be planted to meet TfNSW's offset ratios. Any additional trees that are found to require removal during construction would also need to be approved by TfNSW for removal and offsetting.

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

- A qualified ecologist would be present during tree clearance operations to monitor fauna impacts and, where necessary, remove displaced animals.
- Should the detailed design or onsite works determine the need to remove or trim any additional trees, the Contractor is to complete TfNSW's Tree Removal Application Form and submit it to TfNSW for approval.
- Works within proximity to existing native trees should consider the tree protection zone (TPZ), which is calculated as a circular area with a radius 12 x the diameter at breast height of the tree in line with AS 4970-2009 Protection of Trees on Development Sites. Any ground disturbance within this area would require an arborist to undertake further assessment before proceeding.
- Offsets and/or landscaping would be undertaken in accordance with TfNSW's Vegetation Offset Guide (TfNSW, 2016c) and in consultation with Woollahra Municipal Council, and/or the owner of the land upon which the vegetation is to be planted. Where possible, attempts must be made to apply all or part of the offsetting to the station precinct. Any additional clearing would also require assessment and tree offset planting.
- Weed control measures, consistent with TfNSW's *Weed Management and Disposal Guideline* (TfNSW, 2015b), are to be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during construction. This would include the management and disposal of weeds in accordance with the *Biosecurity Act 2015.*

Refer to Table 23 in Section 7.2 for a full list of proposed mitigation measures.

6.8 Contamination, landform, geology and soils

A geotechnical desktop assessment and contamination assessment was undertaken as part of the REF. The findings are summarised in this section.

6.8.1 Existing environment

Landform, geology and soils

The 1:100,000 Geological Map of Sydney indicates that the geology underlying the Proposal is Hawkesbury sandstone of the Wianamatta Group which comprises medium to course grained quartz sandstone with very minor shale and landscape lenses. The vicinity of Edgecliff Station is mapped as the Hawkesbury soil landscape on the 1:100,000 Sydney Soil Landscape Series. Hawkesbury soils are described as shallow (>50 cm), discontinuous Lithosols/Siliceous Sands associated with rock outcrops; Earthy Sands, Yellow Earths and some Yellow Podzolic Soils on inside of benches and along joints and fractures; localised Yellow and Red Podzolic Soils associated with shale lenses; Siliceous Sands and secondary Yellow Earths along drainage lines.

Acid Sulfate Soils

A review of the Australian Soil Resource Information System National Acid Sulfate Soils Database indicated that there is an extremely low probability of occurrence for acid sulfate soils within the vicinity of the Proposal.

Contamination

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

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

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

A search of the public register of notices issued by the NSW EPA under CLM Act was conducted on 1 November 2017. One site within Woollahra LGA was identified as being declared ‘Significantly Contaminated Land’. The site is a petrol station in Rose Bay, approximately 3 kilometres north east of Edgecliff Station. There were no sites in the vicinity of Edgecliff Station identified as contaminated to an extent that warrants regulation.

6.8.2 Potential impacts

a) Construction phase

The Proposal would require excavation work for the installation of foundations and footings for new lift shafts and lifts. Other excavation may be required for the removal of the garden bed on

New McLean Street for the construction of the path from the kiss and ride zone to the concourse level. Relocation of services, drainage works, new lighting and bicycle racks would also require excavation.

Erosion and Sedimentation

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 lead to an adverse environmental impact on biodiversity, for example through the introduction of sediment into waterways.

These impacts are considered 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 area. 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 refurbishment of the Platform Building. Appropriate mitigation measures would be implemented to manage hazardous substances during demolition works. This would include the removal of hazardous materials from the structure by appropriately licensed asbestos/hazardous waste removalists. There is also potential for construction activities to result in the contamination of soil through accidental fuel or chemical spills from construction plant and equipment

b) Operational phase

There would be no operational risks to geology or 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 and implemented in accordance with the Blue Book. The Erosion and Sediment Control Plan would be established prior to the commencement of construction and be updated and managed according to the activities occurring during construction.

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

As there is potential for onsite contamination given historic activities associated with the railway land use, prior to construction commencing, a contamination investigation would be undertaken by a suitable qualified professional to confirm the composition and nature of excavated material. Where spoil is classified as unsuitable for reuse it would be transferred to an appropriately licensed offsite waste disposal facility.

The handling, storage, transport and disposal of all asbestos and hazardous waste (including lead waste) would be in accordance with the requirements of the PoEO Act, WARR Act and relevant guidelines. Impacts and mitigation measures for waste management are discussed in Section 6.11.1.

Refer to Table 23 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

Edgecliff Station is located in the lower section of Rushcutters Bay Catchment which drains to Sydney Harbour via Rushcutters Bay. The lower section comprises flatter terrain and is drained to the Harbour via a large box culvert and a Sydney Water open channel, which generally runs in a north-westerly direction. A 150 millimetre Ductile Iron Water main has been identified in New McLean Street

Groundwater

A search of the NSW Department of Primary Industries All Water database was undertaken on 1 November 2017. No registered groundwater wells were identified within 500 metres of the Proposal. The nearest was located approximately 3.2 km south west at Moore Park Golf Club. The shallowest standing water level at this location was 5.3 below ground surface.

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

Flooding

Flooding problems have been experienced at a number of locations within the catchment during periods of heavy rainfall. The Station precinct is located between the Rushcutters Bay flood plain area. A flood study conducted by WMA Water in 2012 detailed flood liable buildings within the lower Rushcutters Bay Catchment. Edgecliff Station Precinct does not form part of the flood liable buildings identified.

6.9.2 Potential impacts

a) Construction phase

Without appropriate safeguards, pollutants (fuel, chemicals or wastewater from accidental spills and sediment from excavations and stockpiles) could potentially reach nearby stormwater drains and flow into waterways. Activities which would disturb soil during construction work also have the potential to impact on local water quality as a result of erosion and run off sedimentation.

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

Moderate to heavy wet weather events may cause localised flooding which could increase the potential for soil erosion and sedimentation impacts on stormwater. Where required, dewatering activities would be undertaken in accordance with the Blue Book and managed in line with TfNSW's *Water Discharge and Reuse Guideline* (TfNSW, 2017e). If required,

dewatering volumes are unlikely to be significant (generally less than one megalitre), and an aquifer interference licence would not be required.

b) Operational phase

The Proposal is unlikely to have a significant impact on the hydrology of the surrounding area. Removal of the garden bed and construction of the new accessible entry ramp would result in a minor alteration to the surface water flow regime for runoff around New McLean Street, due to a minor increase in hardstand areas. Alterations to the surface water flows would likely be within the capacity of the stormwater network and as such, impacts would be minor.

Consultation has been undertaken with Woollahra Council regarding the additional volume of stormwater generated from the station entering Council's existing drainage system. Consultation would continue during detailed design and construction.

6.9.3 Mitigation measures

The following flood mitigation measures are to be considered during detailed design:

- information with regards to the capacity of the existing surface water drainage
- final drainage arrangements and flooding risks.

The following mitigation measures would also be implemented:

- an Erosion and Sediment Control Plan would be prepared and implemented in accordance with the requirements of the Blue Book (*Managing Urban Stormwater: Soils and Construction – Landcom, 2004*) for the Proposal to manage risks to water quality.
- spill kits would be available on site and included on environmental control maps (ECMs), and training in spill response procedures would form part of the site inductions provided for construction staff
- dewatering (if required) would be undertaken in accordance with *TfNSW's Water Discharge and Reuse Guideline* (TfNSW, 2017e)
- platform regrading works would be undertaken with consideration of drainage requirements (such as a new drainage pipe or grated drainage channel if required).

Refer to Table 23 in Section 7.2 for a full list of proposed mitigation measures. All mitigation measures are to be incorporated into the CEMP.

6.10 Air quality

6.10.1 Existing environment

Based on the land uses surrounding Edgecliff Station, the existing air quality is likely to be characteristic of an urban environment. A search of the National Pollutant Inventory undertaken on 1 November 2017 for the 2015-2016 reporting period identified no existing and registered sources of air pollution in the Woollahra LGA.

The broader Sydney East monitoring region provides the closest air quality monitoring results to Edgecliff, with air quality currently monitored from sites at Chullora, Rozelle, Lindfield, Randwick and Earlwood.

A search of the daily regional air quality index for the Sydney East region for last year (October 2016 to October 2017) showed that the region experienced:

- very good air quality on 4.4 per cent of days

- good air quality on 67 per cent of days
- fair air quality on 17 per cent of days
- poor air quality on 7.4 per cent of days
- very poor air quality on 1.6 per cent of days
- hazardous air quality on 2.5 per cent of days.

The main contributor to air quality surrounding the Proposal is emissions from motor vehicles on the surrounding road network.

Sensitive receivers in the vicinity of the Proposal include staff and customers at Edgecliff Station, residential and commercial properties around the station, Ascham School, customers and retailers at the Edgecliff Centre and Eastpoint Food Fair.

6.10.2 Potential impacts

a) Construction phase

Temporary air quality impacts that have the potential to occur during construction include minor increases in dust and emissions of carbon monoxide, sulphur dioxide, particulate matter, nitrous oxides, volatile organic compounds and other substances associated with excavation and the combustion of diesel fuel and petrol from construction plant and equipment.

Anticipated sources of dust and dust-generating activities include:

- excavation for new lift footings
- removal of the garden bed on New McLean Street
- trenching and excavation for footpath works, relocation of services, drainage works, new lighting and bicycle racks
- upgrade of surrounding interchange facilities
- demolition of walls to provide pedestrian passing bays
- stockpiling activities
- loading and transfer of material from trucks
- other general construction activities.

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

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

b) Operational phase

Overall impacts on air quality during the operation of the Proposal would be negligible as the Proposal would not result in a change in land use. Also, as the Proposal would increase access to public transport, the use of public transport would be expected to increase and lead to a relative reduction in the amount of private vehicle related emissions in the long-term.

6.10.3 Mitigation measures

Table 23 in Section 7.2 provides a list of mitigation measures that are proposed to manage air quality during construction. They are aimed around maintaining and operating plant and equipment efficiently and implementing measures for dust suppression including watering,

covering loads and appropriate management of tracked dirt/mud on vehicles. Such measures would be included in the CEMP to be prepared for the Proposal.

6.11 Other impacts

6.11.1 Waste

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

- asphalt and concrete
- surplus building materials
- excavated spoil
- building material wastes (including metals, timbers, plastics, packaging, fencing etc.)
- electrical wiring and conduit waste (from electrical connections)
- hazardous chemical wastes
- green waste (including weeds)
- demolition waste from the existing pavement at the New McLean Street entrance including potential asbestos and hazardous waste
- general waste, including food scraps generated by construction workers.

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

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

Waste management targets in accordance with the NSW Sustainable Design Guidelines – Version 4.0 (TfNSW, 2017b) would be developed for the Proposal and would include reuse and recycling.

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

Refer to Table 23 in Section 7.2 for a full list of proposed mitigation measures. All mitigation measures are to be incorporated into the CEMP.

6.12 Cumulative impacts

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

A search of the Department of Planning and Environment's Major Projects Register, Sydney East Joint Regional Planning Panel Development and Planning Register, and Woollahra Council Development Application Register on 6 November 2017 found the following development within proximity to the Proposal:

- White City redevelopment application at 30 Alma Street Paddington (Development Application No 438/2015 – Stage 1 – Indicative building envelopes, use and heritage interpretation strategy)

The Development application is for Stage 1 concept approval at White City, approximately 300 metres west of Edgecliff Station. As no construction development application has been lodged, the White City works are not anticipated to be undertaken concurrently with the Proposal.

During construction, the works would be coordinated with any other construction activities in the area. Consultation and liaison would occur with Woollahra Council, RailCorp/Sydney Trains, and any other developers identified, to minimise cumulative construction impacts such as traffic and noise.

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

Based on this assessment, it is anticipated that the cumulative impacts would be minor/negligible, provided that consultation with relevant stakeholders and mitigation measures in Table 23, Section 7.2 are implemented.

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

6.13 Climate change and sustainability

6.13.1 Greenhouse gas emissions

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

The detailed design process would undertake an AS 14064-2 (Greenhouse Gases - project level) compliant carbon footprinting exercise in accordance with TfNSW's Carbon Estimate and Reporting Tool (TfNSW 2016e). The carbon footprint would be used to inform decision making in design and construction if the estimated greenhouse gas emissions are determined to be greater than the carbon dioxide equivalent value established by the National Greenhouse and Energy Reporting threshold.

Due to the small scale of the Proposal and the short term temporary nature of the individual construction works, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Table 23.

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 Edgecliff. A modal shift in transport usage may reduce the amount of fuel consumed by private motor vehicles with a corresponding relative reduction in associated greenhouse gas emissions in the local area.

6.13.2 Climate change

The dynamic nature of our climate system indicates a need to focus attention on how to adapt to the changes in climate whilst understanding the limitations 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 expected to occur in a 100-year average recurrence interval flood event could occur more frequently. Such changes in weather in the Edgecliff region are unlikely to impact on the Proposal (for more information on flooding refer to Section 6.9).

Another possible outcome of climate change could be an increase in frequency and severity in bushfires. The Proposal is not situated on land identified as bush fire prone, but would be designed with appropriate fire protection measures. Edgecliff is highly urbanised with only very small pockets of vegetation within the area, as such the Proposal is unlikely to be at risk from bushfire.

6.13.3 Sustainability

The design of the Proposal would be developed based on the principles of sustainability, with consideration of the NSW Sustainable Design Guidelines – Version 4.0 (TfNSW, 2017b) and the TfNSW Environmental Management System (EMS). The guidelines consist of a number of compulsory requirements that must be applied to the Proposal. Refer to Section 3.1.4 for more information regarding the application of these guidelines.

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

7 Environmental management

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

7.1 Environmental management plans

A CEMP for the construction phase of the Proposal would be prepared in accordance with the requirements of TfNSW'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 23. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 23 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 *Guideline for Preparation of Environmental Management Plans,* Department of Infrastructure, Planning and Natural Resources, 2004) for approval by TfNSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the 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 TfNSW's *Guide to Environmental Controls Map* (TfNSW, 2017d) for approval by TfNSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.
6.	Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on the ECM to avoid direct impacts during construction.

No.	Mitigation measure
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by TfNSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.
	Traffic and site access
8.	Prior to the commencement of construction, a 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, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made) • managing impacts and changes to on and off street parking and requirements for any temporary replacement provision • parking locations for construction workers away from stations and busy residential areas and details of how this will be monitored for compliance • routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses • details for relocating kiss and ride, taxi ranks and rail replacement bus stops if required, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired • measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the CTMP. A detailed construction impact assessment would be undertaken when further construction details, including access locations and staging are known as part of the CTMP. Consultation with the relevant roads authorities would be undertaken during preparation of the construction CTMP. The performance of all project traffic arrangements must be monitored during construction.
9.	Communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site works.
10.	Project works would be undertaken during scheduled rail possessions where feasible to minimise access, traffic and transport impacts.
11.	Ensure public safety by providing appropriate measures during construction such as the use of traffic controllers, signposting and temporary fencing/hoarding.
12.	Road Occupancy Licences for temporary road closures would be obtained, where required.
13.	Station interchange facilities including bicycle racks, taxi ranks would be kept operational, or temporary facilities provided if impacted, during the construction works.
	Urban design, landscape and visual amenity

No.	Mitigation measure

14.	An Urban Design Plan (UDP) would be prepared by the Contractor, in consultation with the relevant council, and submitted to TfNSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The UDP, at a minimum, would address the following:
	• the appropriateness of the proposed design with respect to the existing surrounding landscape, built form, behaviours and use-patterns (including consideration of Crime Prevention Through Environmental Design principles). This is to include but not be limited to:
	  ○ connectivity with surrounding local and regional movement networks including street networks, other transport modes and active transport networks. Existing and proposed paths of travel for pedestrians and bicycles should be shown
	  ○ integration with surrounding local and regional open space and or landscape networks. Existing and proposed open space infrastructure/landscape elements should be shown
	  ○ integration with surrounding streetscape including street wall height, active frontages, awnings, street trees, entries, vehicle cross overs etc
	  ○ integration with surrounding built form (existing or desired future) including building height, scale, bulk, massing and land-use
	• design detail that is sensitive to the amenity and character of heritage items located within or adjacent to the Proposal site.

15.	A Public Domain Plan (PDP) would be prepared by the Contractor, in consultation with the relevant council, and submitted to TfNSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The PDP, at a minimum, would address the following: • materials, finishes, colour schemes and maintenance procedures including graffiti control for new walls, barriers and fences • location and design of pedestrian and bicycle pathways, street furniture including relocated bus and taxi facilities, bicycle storage (where relevant), telephones and lighting equipment • landscape treatments and street tree planting to integrate with surrounding streetscape • opportunities for public art created by local artists to be incorporated, where considered appropriate, into the Proposal • total water management principles to be integrated into the design where considered appropriate • design measures included to meet TfNSW's *NSW Sustainable Design Guidelines - Version 4.0* (TfNSW, 2017b) • identification of design and landscaping aspects that will be open for stakeholder input, as required.
16.	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.*
17.	The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.
18.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
19.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.

No.	Mitigation measure
20.	During construction, graffiti would be removed in accordance with TfNSW's Standard Requirements.
21.	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
22.	Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise Strategy* (TfNSW, 2016a) and the Noise and Vibration Impact Assessment for the Proposal (Aecom, 2017b). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
23.	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.
24.	The CNVMP would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered, include: • maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances • using the most suitable equipment necessary for the construction works at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours works • use of quieter and less vibration emitting construction methods where feasible and reasonable.

No.	Mitigation measure
25.	Works would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any works outside these hours may be undertaken if approved by TfNSW and the community is notified prior to these works commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted for approval to the TfNSW Environment and Planning Manager for any works outside normal hours.
26.	Where the $L_{Aeq\ (15minute)}$ construction noise levels are predicted to exceed 75 dBA and/or 30 dBA above the Rating Background Level at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with TfNSW"s *Construction Noise Strategy* (TfNSW, 2016a). This would include restricting the hours that very noisy activities can occur.
27.	To avoid structural impacts as a result of vibration or direct contact with structures, the proposed works would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (Aecom, 2017b) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
28.	Vibration resulting from construction and received at any structure outside of the project would be managed in accordance with: • for structural damage vibration - German Standard DIN 4150: Part 3 – 1999 *Structural Vibration in Buildings: Effects on Structures* and British Standard *BS 7385-2:1993 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)* • for human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS *7385-2:1993 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).*
29.	Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory works including jack hammering and compaction for all buildings/structures/roads with a plan distance of 50 metres from the works and all heritage listed buildings and other sensitive structures within 150 metres of the works (unless otherwise determined following additional assessment they are not likely to be adversely affected).
30.	All receivers impacted by noise levels which are expected to exceed the construction NMLs would be consulted about the project prior to the commencement of the particular activity, with the highest consideration given to those that are predicted to be most affected as a result of the works. The information provided to the receivers would include: • Programmed times and locations of construction work. • The hours of proposed works. • Construction noise and vibration impact predictions. • Construction noise and vibration mitigation measures being implemented on site. • Consultation would be consistent with the requirements of TfNSW Construction Noise Strategy (2016a). The highest consideration would be given to receivers that are predicted to be most affected as a result of the works. Complaints during construction would be managed in accordance with Transport for NSW's *Community Engagement Policy*. The construction response line (1800 775 465) would be available during construction.

No.	Mitigation measure
31.	Particularly noisy activities would be scheduled for times when they would have the least impact where feasible and reasonable Where there is potential for continued elevated noise levels (including structure-borne noise), consultation with affected retailers, other businesses premises and Sydney Trains personnel would be undertaken to complete noise or vibration intensive activities outside retail business hours, during periods of low retail activities and low passenger numbers, where reasonable and feasible. This would result in additional works being undertaken outside standard construction hours. Undertaking works outside of standard working hours is advantageous as it reduces the impact on retail premises and Sydney Trains' staff and passengers. Negotiations should be undertaken with retail premises within and around the station to determine if periods of respite are appropriate.
32.	Alternative works methods would be considered and implemented where feasible and reasonable (e.g. saw cutting instead of impact hammering would reduce structure-borne noise). The use of alternative machines that perform the same function e.g. electric/hydraulic in place of diesel; rubber wheeled in place of steel tracked plant) would be considered.
33.	Where possible noisy construction works should be conducted behind hoardings subject to the final construction staging strategy. The hoardings should be full height and be constructed from ≥10 mm plywood or similar.
34.	Truck drivers would be advised of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices (i.e. minimising the use of engine brakes, and no extended periods of engine idling).
35.	Where possible material and equipment deliveries and removal shall be undertaken using high-rail vehicles.
36.	A noise monitoring program would be considered and implemented to assist in confirming and controlling the site specific potential for disturbance at particularly sensitive receivers, at the commencement of activities identified as having the potential to result in exceedances and periodically during the construction program as the works progress. Measurements would also be undertaken in response to complaints. The results would be reviewed to determine if additional mitigation measures are required. All measurements would be undertaken in accordance with Australian Standard 1055.1-1997 – Acoustics – Description and measurement of environmental noise, Part 1: General procedures. A noise monitoring program would be presented in the CNVMP
37.	For vibration-intensive activities which occur within the safe working distance for cosmetic damage for heritage items, management methods to mitigate these impacts would include, as a minimum, the following: • the use of less vibration-intensive methods of construction or equipment is preferred where practical to reduce the potential for cosmetic damage. All equipment should be maintained and operated in an efficient manner, in accordance with manufacturer's specifications, to reduce the potential for adverse vibration impacts • attended vibration measurements are undertaken when work commences, to determine site-specific safe working distances. Vibration intensive work should not proceed within the safe working distances unless a permanent vibration monitoring system is installed around one metre from the building footprint, to warn operators (e.g. via flashing light, audible alarm, SMS) when vibration levels are approaching the peak particle velocity objective. Condition surveys of sensitive heritage items shall be undertaken before construction works begins.

No.	Mitigation measure
38.	Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.
	Indigenous heritage
39.	All construction staff would undergo an induction in the recognition of Indigenous cultural heritage material. This training would include information such as the importance of Indigenous cultural heritage material and places to the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites.
40.	If unforseen Indigenous objects are uncovered during construction, the procedures contained in TfNSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2016b) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the OEH and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and the OEH notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location.
	Non-Indigenous heritage
41.	During detailed design, consideration shall be given to: a. referencing the 1970s aesthetic, including the moulded plywood ceilings and the terrazzo flooring b. ensuring the juncture between the lift shaft and surrounding plywood ceilings maintains the existing pattern formed by the curved panels c. reducing the visual impact of the platform fire stairs by integrating elements of the station aesthetic to the structure, such as the accent tiling and rounded corners d. demolition of the tiled walls kept to a minimum and retention of angles and symmetry of the concrete surrounds e. whether any of the plywood ceiling panels or tiles identified for impact can be salvaged or modified and incorporated into the new structure.
42.	A suitably qualified heritage consultant would be engaged to guide the detailed design and construction to ensure heritage impacts are appropriately managed and resolved in consultation with TfNSW.
43.	As the station is listed on the RailCorp (Sydney Trains) Section 170 Heritage and Conservation Register, Sydney Trains will be consulted during the detailed design phase
44.	A heritage induction should be provided to all on-site staff and contractors involved in the Proposal. The induction should clearly describe the heritage constraints of the site.
45.	As170a demolition notification would be submitted to the Heritage Division no less than 14 days prior to proposed demolition works to the Edgecliff Railway Station Group.

No.	Mitigation measure
46.	The Construction Environmental Management Plan would identify significant fabric (plywood ceilings, terrazzo floors and areas of blue tile), and measures to preserve these elements during construction. This should include the careful removal of plywood panels around lift shafts (for future reinstatement), and installation of protective paper or matting to floors and walls around areas of work, as required. This would be undertaken in consultation with a suitability qualified heritage consultant.
47.	Archival photographic recording would be undertaken of the station as a whole prior to the commencement of construction following NSW Heritage Division guidelines *Photographic recording of heritage items using film or digital capture* (NSW Heritage Office, 2006). The Archival recording would focus on areas of significant heritage fabric that would be impacted by the works, such as: a. tiled walls on platform b. plywood ceiling on concourse and platform c. escalators d. phone booths e. terrazzo floors.
48.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in TfNSW's Unexpected Heritage Finds Guideline (TfNSW, 2016b) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and the TfNSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and OEH. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.
49.	Following completion of works, the Section 170 Heritage and Conservation Register listing description and historical context would be updated to reflect the new works and elements within the precinct
	Socio-economic
50.	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.
51.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
52.	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.
53.	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.
54.	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

No.	Mitigation measure
55.	Construction of the Proposal must be undertaken in accordance with TfNSW's *Vegetation Management (Protection and Removal) Guideline* (TfNSW, 2015a) and TfNSW's *Fauna Management Guideline* (TfNSW, 2017c).
56.	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.
57.	A qualified ecologist would be present during tree clearance operations to monitor fauna impacts and, where necessary, remove displaced animals.
58.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the Arborist Assessment (ELA, 2017a) would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through temporary protection measures discussed below.
59.	Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Arborist Assessment (ELA, 2017a). Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs.
60.	In the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
61.	Should the detailed design or onsite works determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete TfNSW's Tree Removal Application Form and submit it to TfNSW for approval.
62.	For new landscaping works, mulching and watering would be undertaken until plants are established.
63.	Weed control measures, consistent with TfNSW's *Weed Management and Disposal Guideline* (TfNSW, 2015b), 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.*
64.	Offsets and/or landscaping would be undertaken in accordance with TfNSW's *Vegetation Offset Guide* (TfNSW, 2016c) and in consultation with the relevant council, and/or the owner of the land upon which the vegetation is to be planted.
	Soils and water
65.	Prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction.

No.	Mitigation measure
66.	Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the works are complete and areas are stabilised.
67.	Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area.
68.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and TfNSW's *Chemical Storage and Spill Response Guidelines* (TfNSW, 2016d).
69.	Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the TfNSW *Chemical Storage and Spill Response Guidelines* (TfNSW, 2016d) during the construction phase. All staff would be made aware of the location of the spill kits and be trained in how to use the kits in the case of a spill.
70.	In the event of a pollution incident, works would cease in the immediate vicinity and the Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager. The EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the POEO Act.
71.	The existing drainage systems would remain operational throughout the construction phase.
72.	Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and TfNSW's *Water Discharge and Reuse Guideline* (TfNSW, 2017e).
	Air quality
73.	Air quality management and monitoring for the Proposal would be undertaken in accordance with TfNSW's *Air Quality Management Guideline* (TfNSW, 2017a).
74.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
75.	Plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling.
76.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
77.	To minimise the generation of dust from construction activities, the following measures would be implemented: • 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
78.	The CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum: • identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data.
79.	An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with WorkCover requirements.
80.	All spoil to be removed from site would be tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility.
81.	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA , 2014) prior to disposal.
82.	Any concrete washout would be established and maintained in accordance with TfNSW's *Concrete Washout Guideline* – draft (TfNSW, 2015c) with details included in the CEMP and location marked on the ECM.
	Climate change and sustainability
83.	Detailed design of the Proposal would be undertaken in accordance with the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2017b) with a view to obtaining a Silver rating or better.
84.	The detailed design process would include a Greenhouse Gases (project level) compliant carbon footprinting exercise in accordance with AS14064-2 and TfNSW's Carbon Estimate Reporting Tool (TfNSW, 2016e). The carbon footprint would then be used to inform decision making in design and construction.
85.	The detailed design process would undertake a climate change impact assessment with reference to the *Climate Change Impacts and Risk Management: A Guide for Business and Government* (Department of the Environment and Heritage, 2006) and the *ISCA 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
86.	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 111 of the EP&A Act, taking into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The Proposal would provide the following benefits:

- improved accessibility for customers at Edgecliff Station providing a compliant path from New South Head Road and New McLean Street to the concourse and an accessible route to the platform through the provision of a new lift
- improved transport interchange facilities and accessibility through the provision of a new lift between the station concourse and the bus interchange (including gallery level retail), a formal kiss and ride zone on New McLean Street and undercover bicycle rack spaces at New McLean Street.

The likely key impacts of the Proposal are as follows:

- temporary noise and vibration impacts during construction
- temporary traffic impacts during construction
- removal of vegetation and subsequent application of planting offsets
- impacts to station heritage fabric from the installation of new lifts, escalators and fire stairs, and the relocation of the ticket gates
- permanent changes to parking arrangements on New McLean Street including the removal of approximately three on-street timed parking spaces.

The longer term benefits of the Proposal include improved accessibility to the station and improved station and interchange facilities.

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

The Proposal would also take into account the principles of ESD (refer to Section 3.1.4 and Section 4.6). These would be considered during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

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Appendix A Consideration of matters of National Environmental Significance

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

Matters of NES	Impacts
Any impact on a World Heritage property? There are no World Heritage Properties in the vicinity of the Proposal.	Nil
Any impact on a National Heritage place? There are no National Heritage places in the vicinity of the Proposal.	Nil
Any impact on a wetland of international importance? There are no wetlands of international importance in the vicinity of the Proposal.	Nil
Any impact on a listed threatened species or communities? There are no wetlands of international importance in the vicinity of the Proposal.	Nil
Any impacts on listed migratory species? It is unlikely that the development of the Proposal would significantly affect any listed migratory species.	Nil
Does the Proposal involve a nuclear action (including uranium mining)? The Proposal does not involve a nuclear action.	Nil
Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the vicinity of the Proposal.	Nil
Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? The Proposal is for a transport facility and does not relate to coal seam gas or mining.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be undertaken on or near any Commonwealth land.	Nil

Appendix B Consideration of clause 228

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

Factor	Impacts
(a) Any environmental impact on a community? There would be some temporary impacts to the community during construction, particularly in relation to noise, traffic, access and visual amenity. Mitigation measures outlined in Section 7.2 would be implemented to manage and minimise adverse impacts.	Minor
(b) Any transformation of a locality? The Proposal would include the introduction of new visible elements in the landscape (including the two new lifts, compliant access ramp and extended canopy over the bus interchange). The appearance of the new elements would be consistent with the existing station elements and are considered to be common features in urban areas. Vegetation trimming is limited to the one garden bed on New McLean Street. The Proposal would have a positive contribution to the locality by creating an accessible entrance and path of travel to and from the station.	Minor
(c) Any environmental impact on the ecosystem of the locality? The Proposal would require the removal of 12 trees within the rail corridor; however this vegetation does not form part of any threatened ecological communities, or is likely to provide habitat for threatened species and so would have a negligible impact to the ecosystem. The extent of vegetation trimming and removal has been minimised as far as practicable. Any additional trees that are found to require removal, not assessed in this REF, would be subject to further assessment, offsetting and approval from TfNSW.	Minor
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? There would be some temporary impacts during construction particularly in relation to noise, traffic and access and visual amenity. The removal of vegetation would also result in a visual change however the number of trees to be removed is limited to 12and would be managed via offsetting.	Minor

Factor	Impacts
(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 a positive contribution to the locality by creating equitable access to the station, the platform and the bus interchange. The station is listed on the RailCorp (Sydney Trains) Section 170 Heritage and Conservation Register as having local heritage significance. The Proposal would result in some minor impacts to some parts of the station. Impacts to heritage would be minimised through the implementation of the mitigation measures provided in the REF. A desktop archaeological assessment has been undertaken which determined that there is a low risk of encountering archaeological items/deposits and that the Proposal is unlikely to expose historical archaeological relics.	Minor
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The Proposal is unlikely to have any impact on the habitat of protected fauna.	Nil
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The Proposal is unlikely to have any impact on endangering any species of animal, plant or other form of like, whether living on land, in water or in the air.	Nil
(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 of the quality of the environment.	Nil
(j) Any risk to the safety of the environment? Provided the recommended mitigation measures are implemented, the Proposal is unlikely to cause any pollution or safety risks to the environment. Specific management measures would be implemented to manage asbestos and other hazardous materials that may be encountered during construction works.	Minor
(k) Any reduction in the range of beneficial uses of the environment? The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.	Nil
(l) Any pollution of the environment? The Proposal is unlikely to cause any pollution of the environment provided the recommended mitigation measures are implemented.	Nil

Factor	Impacts
(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. Hazardous waste and special waste may be generated from the Proposal. Prior to construction, contamination investigations would be undertaken to confirm the presence of contaminated material, particularly asbestos. All waste would be managed and disposed of with a site-specific Waste Management Plan prepared as part of the Construction Environmental Management Plan. Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.	Minor
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Proposal is unlikely to increase demands on resources that are, or are likely to become, in short supply.	Nil
(o) Any cumulative environmental effect with other existing or likely future activities? Cumulative effects of the Proposal are described in Section 6.12. Where feasible, project activities and environmental management measures would be co-ordinated to reduce any cumulative construction impacts. The Proposal is unlikely to have any significant adverse long-term impacts.	Nil
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The Proposal is unlikely to impact on coastal processes and coastal hazards, including those under projected climate change conditions.	Nil

Appendix C Sustainable Design Guidelines checklist

Initiative	Theme	Description	Under consideration
1	Energy and greenhouse gases	All projects with a CapEx > $15 million to reduce construction related GHG emissions by a minimum 5% from the project baseline GHG footprint established using the Carbon Estimate and Reporting Tool (CERT).	Yes
2	Energy and greenhouse gases	Buildings are required to be designed and built to reduce energy consumption: • Covered or uncovered areas shall meet pre-requisite requirements for services (Appendix F, Section 3). • Enclosed building spaces shall meet the performance targets of the energy modelling pathway (P2-P5). • Where enclosed building space cost < $10 million the prescriptive pathway may be followed in lieu of energy modelling (P1).	Yes
2A	Energy and greenhouse gases	All new electrical equipment (for the final asset) to be at least market average star rating. In categories where no star ratings are available, equipment purchased should be recognised as high efficiency either by being ENERGY STAR accredited, in a high efficiency band under Australian Standards or being above-average efficiency of Greenhouse and Energy Minimum Standards (GEMS) registered products.	Yes
3	Climate resilience	All projects with a CapEx >$15 million to undertake a climate risk assessment that mitigates all extreme and high residual risks. Refer to I&S Climate Risk Assessment Guide for further guidance.	Yes
4	Materials and waste	90% of construction waste and demolition waste (by weight) to be diverted from landfill for all projects with a CapEx > $15 million.	Yes

Initiative	Theme	Description	Under consideration
5	Materials and waste	The aim of this requirement is to reduce resource consumption and waste generation in the design and construction of projects. Projects should consider: • Balancing site works to avoid excess or importation of spoil. • Reuse any excess usable spoil on site (e.g. – landform feature, visual screening, noise attenuation). • Reuse any excess usable spoil off site (e.g. – at a nearby development where the spoil meets use requirements).	Yes
6	Water	All new effective impervious area with a continuous area >1000m² to be treated through water sensitive urban design.	Yes
7	Water	All projects with a CapEx > $15 million to monitor and report water consumption during project construction and reduce potable water consumption where practicable.	Yes
8	Water	All projects with a CapEx >$15 million to undertake a water balance study and identify and implement appropriate and proportionate* operational water efficiency measures.	Yes
8A	Water	All new water-using appliances, shower heads, taps and toilets must be at least the average Water Efficiency Labelling Scheme (WELS) star rating by product type.	Yes
9	Pollution control	All surface coatings to comply with the Australian Paint Approval Scheme (APAS) Volatile Organic Compounds Limits where fit for purpose	Yes
10	Pollution control	All mobile non-road diesel plant and equipment (with an engine greater than 19kW) to report engine conformity with relevant United States Environmental Protection Agency (US EPA), European Union (EU) or equivalent emissions standards and the fitting of any exhaust after-treatment devices. Reporting should be in accordance with the Air Emission Data Workbook – 9TP-FT-439.	Yes
11	Biodiversity	All projects with non-significant biodiversity impacts to comply with the Infrastructure and Services Vegetation Offset Guide as applicable.	Yes

Initiative	Theme	Description	Under consideration
12	Community benefit	All projects must: i. meet steel and timber sustainable procurement requirements; and ii. undertake sustainable procurement training for high impact suppliers.	Yes
13	Community benefit	All projects to address the urban design principles in the TfNSW Interim Urban Design Best Practice Guidelines within their urban design and landscaping plan (UDLP).	Yes
14	Community benefit	The project is awarded at least 1 point for a single initiative against the ISCA Innovation Credit Inn-1 OR The project makes a contribution to industry and/or the local community in line with the project legacy categories specified (Note: the requirements are determined by CapEx).	Yes