NSW GOVERNMENT

Transport Access Program

East Hills Station Upgrade

Review of Environmental Factors

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

November 2020

East Hills Station Upgrade Review of Environmental Factors

Transport Access Program

Ref – 6526795

Contents

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Figures

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Abbreviations

Term	Meaning
ABS	Australian Bureau of Statistics
ACT	Australian Capital Territory
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
ARI	Average Recurrence Interval
ASA	Asset Standards Authority (refer to Definitions)
ASS	Acid Sulfate Soils
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CBD	Central Business District
CCTV	Closed Circuit TV
CEMP	Construction Environmental Management Plan
CLM Act	*Contaminated Land Management Act 1997* (NSW)
CM SEPP	*State Environmental Planning Policy (Coastal Management) 2018* (NSW)
CNVMP	Construction Noise and Vibration Management Plan
CNVS	Construction Noise and Vibration Strategy
CPTED	Crime Prevention Through Environmental Design
CTMP	Construction Traffic Management Plan
DAWE	Department of Agriculture, Water and the Environment (Cwlth)
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
D&C	Design & Construct
DDA	*Disability Discrimination Act 1992* (Cwlth)

Term	Meaning
DPIE	NSW Department of Planning, Industry and Environment
DSAPT	*Disability Standards for Accessible Public Transport 2002* (Cth)
ECM	Environmental Controls Map
EES	NSW Environment, Energy and Science (Division of Department of Planning Industry and Environment) (formerly OEH)
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
EWP	Elevated Work Platform
FAT	Family Accessible Toilet
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
ICNG	*Interim Construction Noise Guideline* (DECC 2009).
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)
IS rating	Infrastructure Sustainability rating under ISCA rating tool (v 1.2)
ISCA	Infrastructure Sustainability Council of Australia
LEP	Local Environmental Plan
LGA	Local Government Area
NCA	Noise Catchment Areas
NEPM	*National Environmental Protection (Ambient Air Quality) Measure*

Term	Meaning
NES	National Environmental Significance
NML	Noise Management Levels
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	(former) NSW Office of the Environment and Heritage
OOHW	Out of hours works
PA system	Public Address system
PCT	Plant Community Type
PDP	Public Domain Plan
PMF	Probable Maximum Flood
PMST	Protected Matters Search Tool
PIDs	Passenger Information Displays
PoEO Act	*Protection of the Environment Operations Act 1997* (NSW)
QR	Quick Response
RailCorp	(former) Rail Corporation of NSW
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Roads Act	*Roads Act 1993* (NSW)
Roads and Maritime	(former) NSW Roads and Maritime Services (now part of Transport for NSW)
ROL	Road Occupancy Licence
SEPP	State Environmental Planning Policy
SEPP 55	*State Environmental Planning Policy No.55 — Remediation of Land* (NSW)
SHR	State Heritage Register
SRZ	Structural Root Zone

Term	Meaning
TAA	*Transport Administration Act 1988* (NSW)
TAP	Transport Access Program
TAHE	Transport Asset Holding Entity
TfNSW	Transport for NSW
TGSI	Tactile Ground Surface Indicators (“tactiles”)
TMP	Traffic Management Plan
TPZ	Tree Protection Zone
TVM	Ticket Vending Machine
UDP	Urban Design Plan
VP	Viewpoint
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
WM Act	*Water Management Act 2000* (NSW)

Definitions

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

Term	Meaning
NSW Trains	From 1 July 2013, NSW Trains became the new rail provider of services for regional rail customers.
Opal card	The integrated ticketing smartcard being introduced by Transport for NSW.
Out of hours works	Defined as works *outside* standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act - in this instance, Transport for NSW.
(the) Proposal	The construction and operation of the East Hills Station Upgrade.
Proposal area	The area of the construction and operation of the East Hills Station Upgrade Project.
Rail possession / shutdown	Shutdown is the term used by railway building/maintenance personnel to indicate that they have taken possession of the track (usually a section of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Reasonable	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.
Scoping design	The scoping design is the preliminary design presented in this REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
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.
Vegetation Offset Guide	The Transport for NSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 5.5 of the EP&A Act. The Guide provides for planting of a minimum of eight trees for each large tree with a diameter at breast height (DBH) of more than 60 cm, four trees where the DBH is 15-60 cm, or two trees where DBH is less than 15 cm.

Executive summary

Overview

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

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

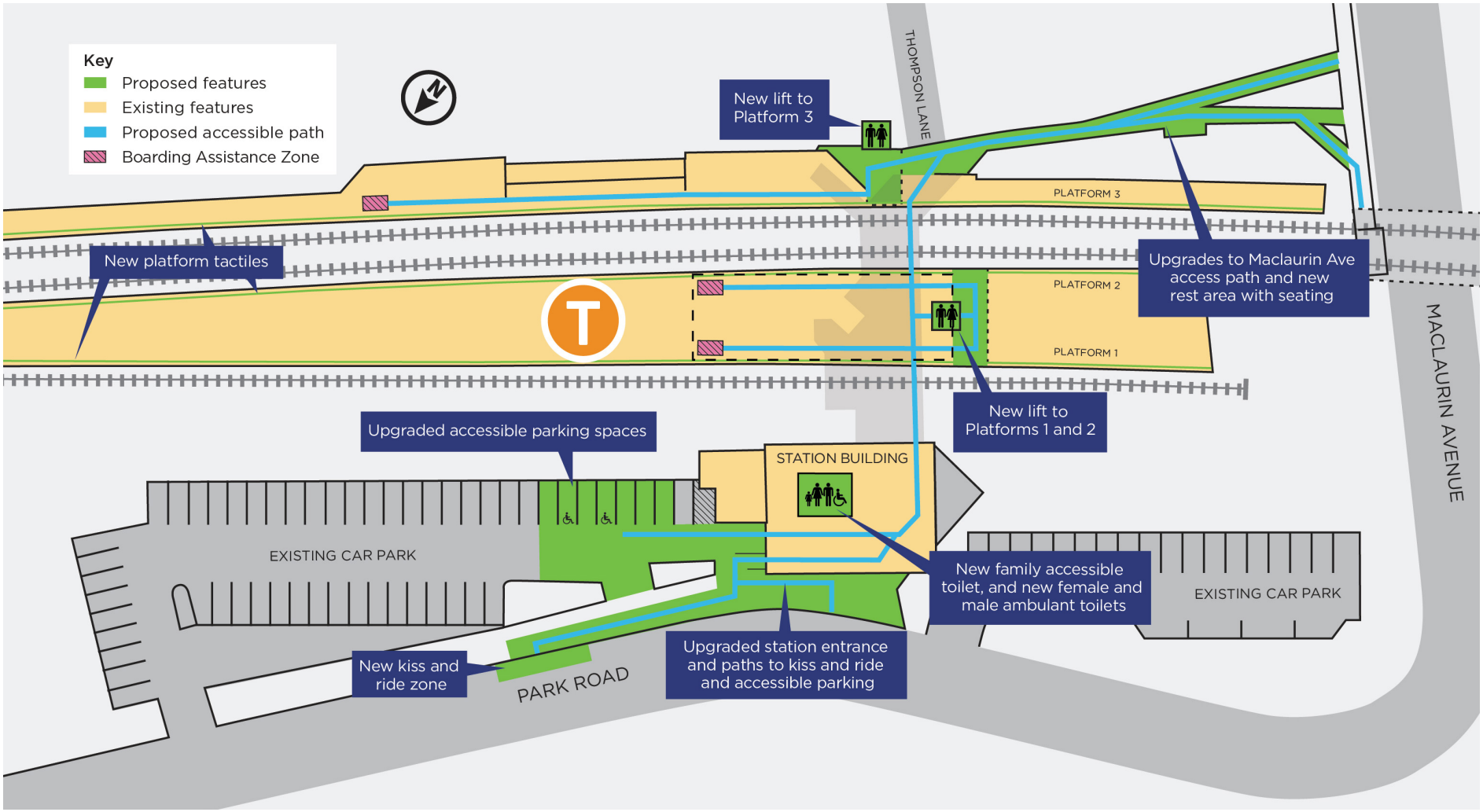
The Proposal would provide:

- two new lifts to provide access between the existing station underpass and the platforms
- upgrades to the existing station entrances on Park Road and Thompson Lane
- upgrade of the two accessible parking spaces in the commuter car park along Park Road
- a new kiss and ride space on Park Road adjacent to the taxi zone
- a new unisex Family Accessible Toilet (FAT), and new male and female ambulant toilets
- electrical upgrades for new infrastructure
- new lighting, closed circuit television (CCTV) and wayfinding signage.

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

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

Subject to approval, construction is expected to commence in mid 2021 and take up to 18 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF. An overview of the Proposal is shown in Figure ES-1 and photomontage shown in Figure ES-2.



(Indicative only, subject to detailed design)

Figure ES-1 Key features of the Proposal

(Indicative only, subject to detailed design)

Figure ES-2 Photomontage of the Proposal, viewed from Platform 1/2

Need for the Proposal

As an operator of public transport under the *Disability Discrimination Act 1992* (DDA), Transport for NSW is required to upgrade the public transport precincts to ensure equitable access is provided for all customers.

Some public transport stations, wharves and stops do not currently meet the requirements of the federal *Disability Standards for Accessible Public Transport 2002* (DSAPT).

The Standards set out minimum accessibility requirements for public transport providers and ensure that people with disability have equivalent access to public transport services.

The Proposal would ensure that East Hills Station would meet legislative requirements under the DDA and the DSAPT.

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

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

Community and stakeholder consultation

Initial community consultation was undertaken from 23 September to 14 October 2020. A mix of locally letterbox dropped notifications, advertisement (on Facebook) and station posters helped promote the engagement period and encourage the community to provide their feedback on the concept designs. Face to face engagement in the form of information sessions were not conducted due to social distancing requirements associated with COVID-19. A total 59 comments were received during the engagement period. Key themes of community feedback included:

- general support for the Proposal
- consideration for additional canopy coverage on station platforms
- consideration for bike, accessible and commuter parking spaces
- consideration for improved station amenities including food/drinks outlets, more accessible bathrooms, bins and seating
- consideration for reduced gap between platforms and trains and improved visibility of passengers boarding and alighting trains on Platform 3
- consideration for more train services
- consideration for improved landscaping surrounding station.

Feedback on the scoping design is being considered by the project team and used to help inform the design development.

Community consultation activities for the Proposal would be undertaken during the public display period of this REF with the public invited to submit feedback to help Transport for NSW understand what is important to customers and the community. The REF would be displayed for a period of two weeks. Further information about these specific consultation activities is included in Section 5.3 of this REF.

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

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

Feedback can be sent to:

- Email: projects@transport.nsw.gov.au
- Write to : Transport Access Program – East Hills Station Upgrade
  Associate Director Environmental Impact Assessment
  Transport for NSW
  PO Box K659
  Haymarket NSW 1240
- Online feedback form via transport.nse.gov.au/easthills

Transport for NSW would review and assess all feedback received during the public display period, prior to determining whether to proceed with the Proposal.

Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure ES-3 shows the planning approval and consultation process for the Proposal.

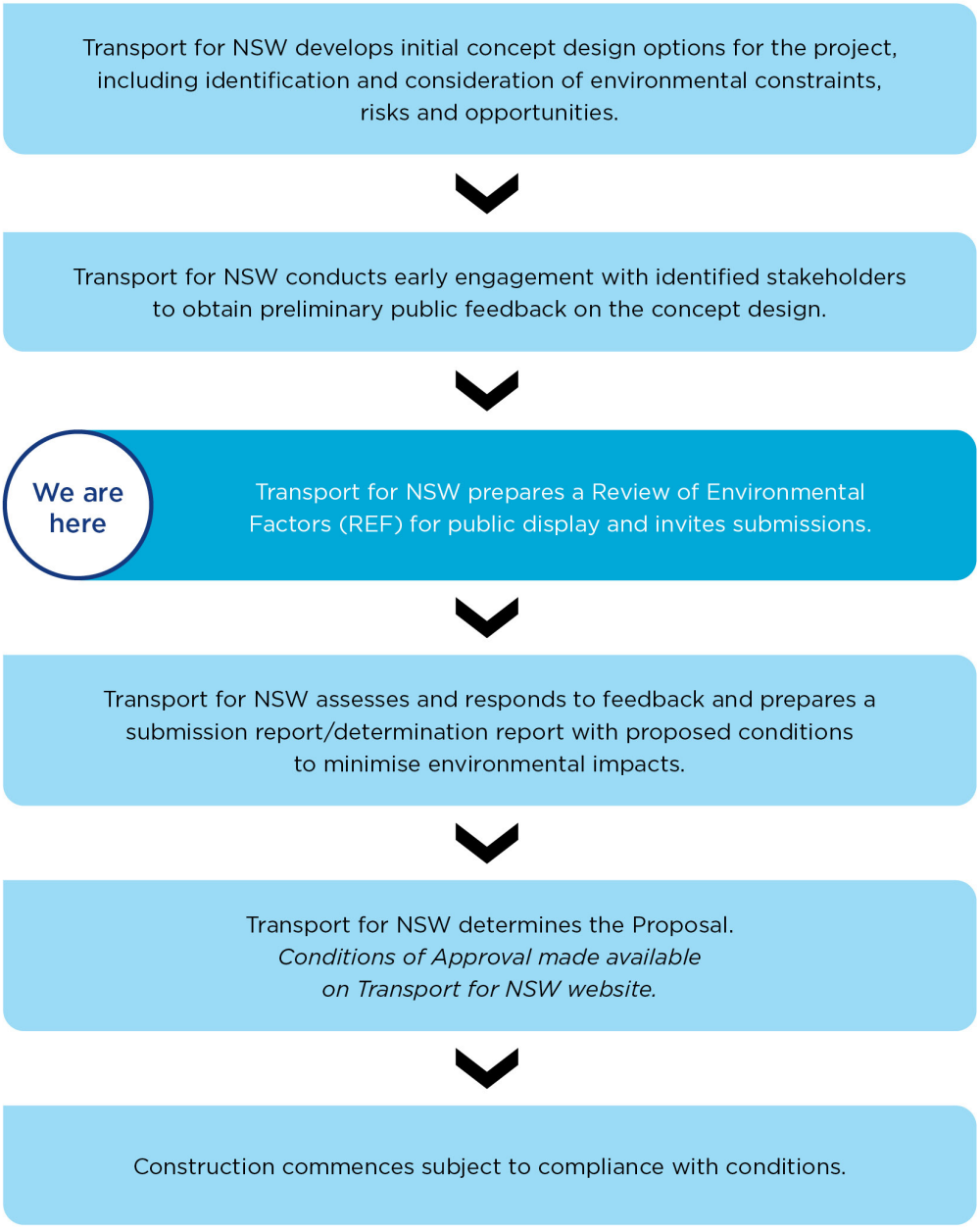


Figure ES-3 Planning approval and consultation process for the Proposal

Environmental impact assessment

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

The Proposal would provide the following benefits:

- a station that is accessible to people with a disability, limited mobility, parents with prams and people with luggage
- upgraded buildings and facilities for all modes that meet the needs of a growing population
    - improved interchange and access facilities that supports an integrated network and allows seamless transfers between all modes for all customers.

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

- minor impacts on local traffic flow associated with construction traffic and construction
- temporary noise and vibration impacts associated with construction activities
- removal of around three trees
- potential sediment runoff, dust generation and erosion risk during construction
- risk of flooding of the compound site at Thompson Lane during construction
- disruption to station facilities and amenities during construction
- changes to vehicular, bike and pedestrian access around the station during construction
- reduction in parking availability for customers and local residents during construction
- changes to the visual environment due to the introduction of new elements, such as the station entrance, lifts and associated weather canopies.

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

Conclusion

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

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

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

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

1 Introduction

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

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

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

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

The TAP aims to provide:

- stations that are accessible to people with disabilities or limited mobility, 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.

East Hills Station has been identified for an accessibility upgrade as it does not currently meet the key requirements for the Disability Standards for Accessible Public Transport (DSAPT) or the Commonwealth *Disability Discrimination Act 1992* (DDA). The following accessibility issues have been identified at East Hills Station and have been addressed in the design of the upgrade:

- the existing paths from the public domain footpaths to the station entries are not currently compliant with DDA standards
- access to platforms is currently via a ramp or stairs that are not compliant with DDA standards
- existing handrails on the platform-to-underpass stairs are non-compliant with DDA standards
- there is no family accessible toilet or ambulant toilets
- the existing accessible car parking spaces within the commuter car park along Park Road are not compliant with current DDA standards.

1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- construction of two new lifts to provide access between the existing station underpass and the platforms
- upgrade of the existing station entrance on Park Road including:
    - floor regrading and modifications to the entrance with readjustments to bollards and bike hoops
    - upgrade of the existing entry ramp and stairs including upgrade of handrails, stair nosings and tactiles to be compliant with Australian standards and guidelines
    - modifications to the commuter car park along Park Road to allow for the upgrade of the two accessible parking spaces
    - provision of a new accessible kiss and ride space on Park Road adjacent to the taxi zone
- upgrade of the existing station entrance on Thompson Lane including:
    - provision of an accessible pathway between the station underpass, Thompson Lane and Maclaurin Avenue by regrading and modifications to the existing path
    - provision of a new rest area along the accessible pathway
- internal station building work including:
    - reconfiguration of the existing customer toilet facilities to provide one (1) new Family Accessible Toilet (FAT), one (1) new male ambulant toilet and one (1) new female ambulant toilet
    - other minor building modifications that may be required to accommodate new or upgraded electrical equipment including a main switchboard, new or upgraded station communications equipment and other station services
- ancillary work including adjustments to lighting, relocation or replacement of existing customer facilities (platform seating, bins, payphone, Opal card readers, fencing) and improvement to station systems including additional closed circuit television (CCTV) cameras, hearing loops and wayfinding signage.

Subject to planning approval, construction is expected to commence in mid 2021 and take up to 18 months to complete.

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

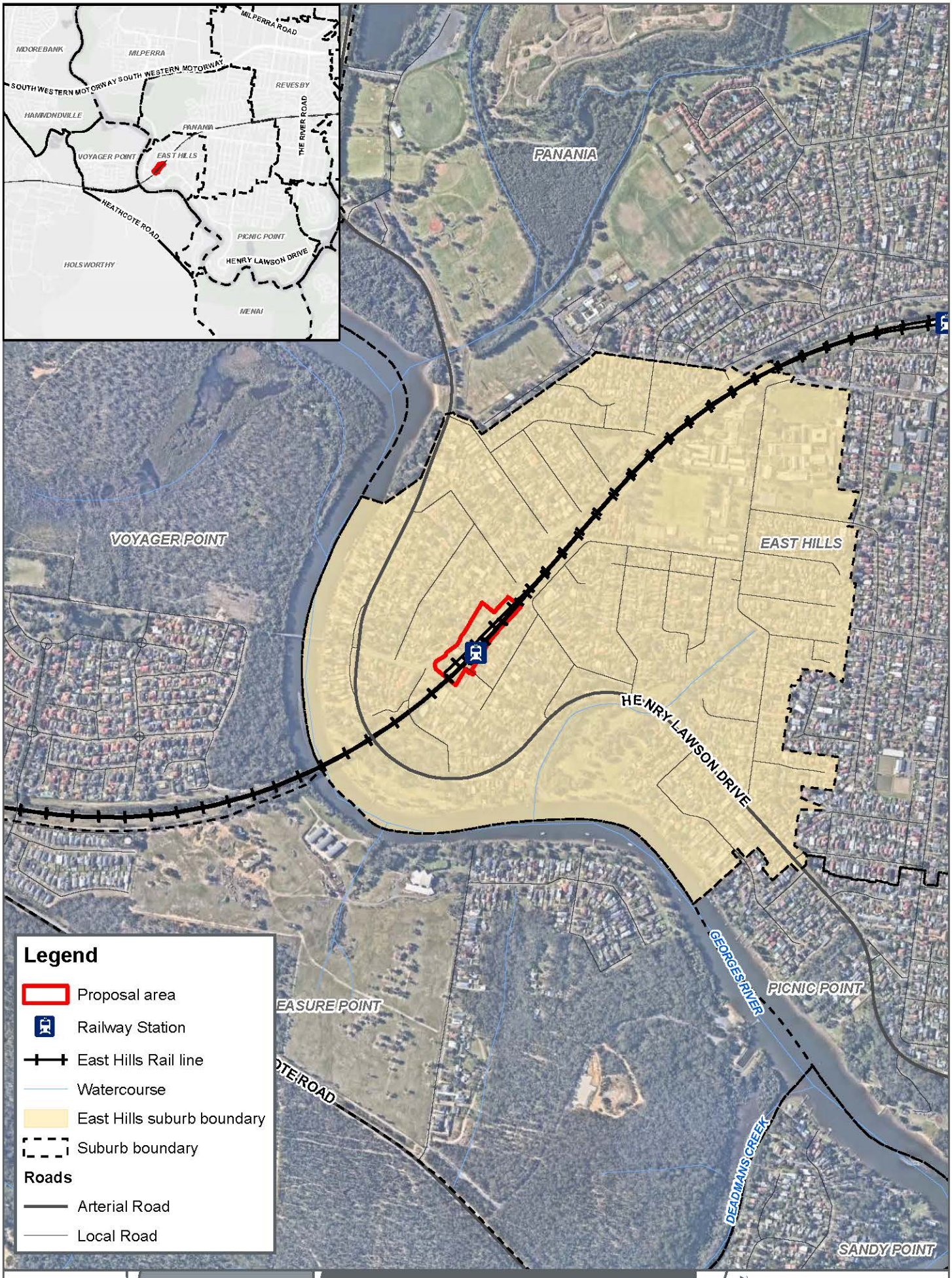
1.2 Location of the Proposal

East Hills Station is located along the T8 – Airport and South Line on an eastern bend of the Georges River, about 26 kilometres southwest of the Sydney Central Business District (CBD) within the Canterbury-Bankstown local government area (LGA).

The Proposal area is generally bounded by Park Road to the west, Maclaurin Avenue to the south and Thompson Lane and Broe Avenue to the east. The majority of the Proposal is located within the station precinct on land owned by the Transport Asset Holding Entity of NSW (TAHE). A new kiss and ride and footpath regrading works are also proposed along Park Road which is owned and managed by City of Canterbury-Bankstown Council.

The station is predominately surrounded by low density residential dwellings to the east and west. Immediately adjacent to the station along Maclaurin Avenue is a cluster of local retail shops. About 700 metres north of the Proposal area are the open space recreational areas and wetlands of the Kelso parklands. About 200 metres southwest and southeast are parklands bordering the Georges River. About 900 metres northeast of the Proposal area is East Hills Girls High School and East Hills Boys High School.

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


MILPERRA ROAD
MOOREBANK
MILPERRA
SOUTH WESTERN MOTORWAY
SOUTH WESTERN MOTORWAY
REVESBY
HAMMONDVILLE
PANANIA
THE RIVER ROAD
VOYAGER POINT
EAST HILLS
HEATHCOTE ROAD
PICNIC POINT
HENRY LAWSON DRIVE
HOLSWORTHY
MENAI
PANANIA
VOYAGER POINT
EAST HILLS
HENRY LAWSON DRIVE
GEORGES RIVER
PICNIC POINT
DEADMANS CREEK
SANDY POINT
Legend
Proposal area
Railway Station
East Hills Rail line
Watercourse
East Hills suburb boundary
Suburb boundary
Roads
Arterial Road
Local Road
FIGURE 1-1
1:12,500 Scale at A4
m
0 75 150 225 300
Regional context
EAST HILLS STATION
Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2020-11-16 | Project: NE30047
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30047-GS-002-RegionalContext.mxd 02
Aerial imagery supplied by Nearmap (October, 2020)
Transport network, watercourses,
and suburb boundaries supplied by NSW SS

1.3 Existing infrastructure and land uses

1.3.1 Station access and facilities

East Hills Station consists of three platforms accessible via a pedestrian underpass that connects Park Road to Thompson Lane. Access to the platforms is from the underpass through the centre of the station. Pedestrian infrastructure surrounding the station includes a footpath on the station side of Park Road and Maclaurin Avenue.

Existing infrastructure on each of the platforms includes:

- Platform 1/2: partial canopy coverage with lighting installed. Handrail and rail guards frame the underpass ramp entrance to the platform. A separate entrance under the canopy is accessed via stairs. Seating is provided along the platform, as well as waste bins, a public address (PA) system and associated railway infrastructure
- Platform 3: partial canopy coverage is provided at the top of both the stair and ramp entries to the platform with lighting installed. Seating is provided along the platform, as well as waste bins, a PA system and associated railway infrastructure.

The infrastructure in the underpass includes:

- covered stairs leading to Platform 1/2
- male and female toilet facilities
- lighting (ceiling and free standing)
- metal fence guards on the side of the ramp to the underpass separating the existing paid and unpaid station concourse areas
- handrails line the access ramp to the underpass and ground rail guards prevent larger vehicles from entering the underpass
- CCTV cameras and Passenger Information Displays (PIDs)
- an Opal card top up machine is provided along with Opal card readers
- vending machines for drinks and snacks.

1.3.2 Interchange facilities

Public transport and other interchange facilities surrounding the station includes:

- a commuter car park along Park Road and Maclaurin Avenue: two formal commuter car parking facilities are provided. A commuter car park accessed from Park Road (48 spaces) as well as a second car park on the corner of Park Road and Maclaurin Avenue (20 spaces) also accessed from Park Road.
- bus stops on Park Road: bus stops are located on either side of Park Road in proximity to the station. These bus stops provide bus services from East Hills to Bankstown via Milperra, East Hills to Miranda, East Hills to Lidcombe via Bankstown and a night service bus from East Hills to City Town Hall and are operated by Transdev.
- bus stop on Maclaurin Avenue: a bus stop is located next to the station on Maclaurin Avenue. The bus stop provides bus services from East Hills to Bankstown via Panania and East Hills to Lidcombe via Bankstown and are operated by Transdev.

- bus stops on Broe Avenue: two bus stops are located on either side of Broe Avenue accessed by the Thompson Lane station entrance. These bus stops provide bus services from East Hills to Bankstown via Panania and East Hills to Lidcombe via Bankstown and are operated by Transdev.
- bike rack and secure bike locker: a bike parking rack with a capacity for seven bikes is provided near the station entrance adjacent to the Park Road car park. An additional 12 bike hoops are located at the Park Road entrance. A secure bike locker is located on Park Road near the bike parking rack and is managed by Transport for NSW.

There are no current formal kiss and ride facilities in the vicinity of the station. A 'No Parking' zone on Park Road is currently used as an informal drop off and pick up area.

The site location of East Hills Station is shown in Figure 1-2. Photos of the existing station infrastructure are shown in Figure 1-3 to Figure 1-8.

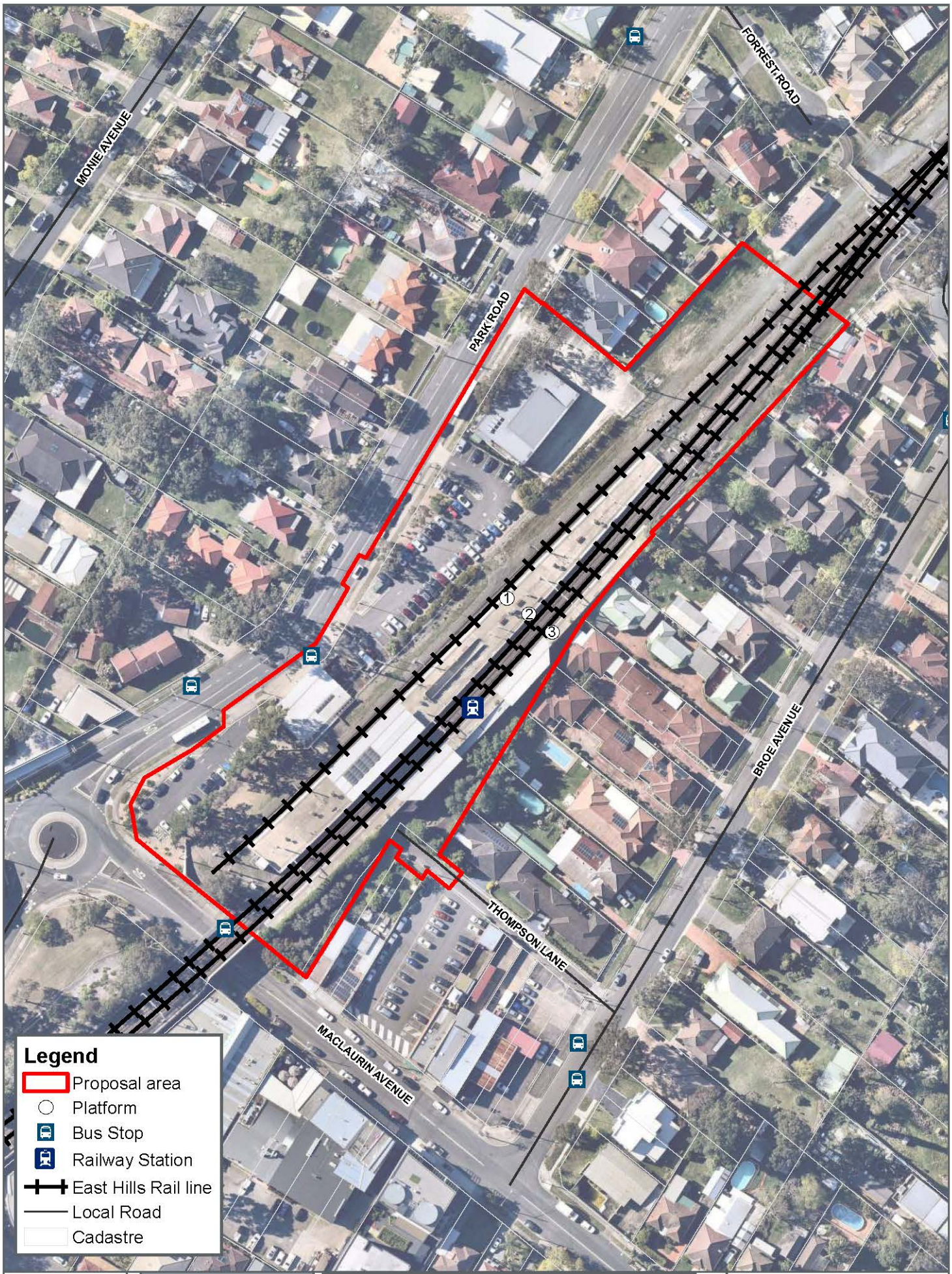


FIGURE 1-2

1:1,500 Scale at A4

m

0 10 20 30 40

Site locality

EAST HILLS STATION

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2020-11-12 | Project: NE30047
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30047-GS-003-Site Locality.mxd 03
Aerial imagery supplied by Nearmap (October, 2020)
Transport network and Cadastre supplied by NSW SS and TfNSW

Figure 1-3 Station entrance looking south from the Park Road commuter car park (Park Road)

Figure 1-4 Station underpass looking towards the Thompson Lane entrance

Figure 1-5 Platform 1 looking southwest

Figure 1-6 Platform 1/2 looking southwest

Figure 1-7 Maclaurin Avenue footpath looking towards Maclaurin Avenue

Figure 1-8 Thompson Lane station entry

1.4 Purpose of this Review of Environmental Factors

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

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

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

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

2 Need for the Proposal

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

2.1 Strategic justification

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

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

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

Policy / Strategy	Overview	How the Proposal aligns
Future Transport Strategy 2056 (TfNSW, 2018)	*Future Transport Strategy 2056* (the Strategy) is an update of NSW's *Long Term Transport Master Plan*. It is a suite of strategies and plans for transport to provide an integrated vision for the state. The Strategy identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport.	The TAP is identified in the Strategy as an example of the NSW Government working to improve accessibility of the rail network. As identified in the Strategy, the delivery and modernisation of infrastructure would allow greater access for people with disabilities and those with limited mobility. The Proposal would assist in meeting the following State-wide outcomes detailed in Strategy by: • improving and modernising customer experience • improving accessibility • upgrading technology • improving safety • increasing efficiency between travel.
Disability Inclusion Action Plan (2018-2022) (TfNSW, 2017)	The Disability Inclusion Action Plan 2018-2022 (the Plan) was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, which consists of representatives from peak disability and ageing organisations within NSW. The Plan identifies the challenges, the achievements to date, the considerable undertaking that is required to finish the job and provides a solid and practical foundation for	The Proposal would principally deliver on the Plan's key action of creating liveable communities. The Proposal would make the area of East Hills a more liveable community for people with a disability by improving accessibility at East Hills Station and interchange at the station to other transport modes including bus, taxi and private vehicle.

Policy / Strategy	Overview	How the Proposal aligns
	future progress over the next five years.	
A Metropolis of Three Cities - Greater Sydney Region Plan (Greater Sydney Commission, 2018a)	The Greater Sydney Region Plan is the NSW Government's 40-year land use plan for Sydney. It establishes a vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City. One of the ten directions of the framework is a well-connected city, by developing a more accessible and walkable city, through optimising existing infrastructure where possible.	The Proposal would enable equitable access to services and employment as well as social and cultural opportunities through investment in transport. The proposed upgraded streets and infrastructure would promote public transport movements, walking, cycling and social opportunity, which contribute to the character and identity of the area.
South District Plan (Greater Sydney Commission, 2018b)	The South District Plan covers the Bankstown-Canterbury LGA and is a 20-year plan to manage growth in the context of economic, social and environmental matters to meet the 40-year vision for Greater Sydney.	The Proposal would promote connections between the three cities and increase the ability to access a metropolitan centre/cluster in 30 minutes. It would also accommodate for future forecasted population growth.
Building Momentum – State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)	The State Infrastructure Strategy 2018-2038 makes recommendations for each of NSW's key infrastructure sectors including transport. The Strategy recognises that public transport is critical to productivity, expanding employment opportunities by connecting people to jobs and reducing congestion. A key recommendation in the Strategy is to invest in transport infrastructure that is integrated with land use to create opportunities for agglomeration and enhance productivity, liveability and accessibility.	The Proposal would upgrade public transport services to provide access for a wider range of customers. It would also involve the upgrade of existing infrastructure which aligns with an objective of the strategy to optimise the use of the State's existing assets.
Bankstown Complete Streets – CBD Transport and Place Plan (City of Canterbury-Bankstown Council, 2019)	The Bankstown Complete Streets – CBD Transport and Place Plan (the Plan) details an action plan to identify key action items to accommodate population growth, increased development and allow for improved access and safety for pedestrians, motorists and cyclists to key destinations.	The Plan envisages a community that can easily travel to work by accessible, reliable public transport and road infrastructure. The Proposal would support the objectives of the Plan by making East Hills Station more accessible to the community.
The *Canterbury-Bankstown Community Strategic Plan 2028* (CB2028) (City of Canterbury-	The Canterbury-Bankstown Community Strategic Plan 2028 (CB2028) was prepared to give an opportunity to community members to identify how Canterbury-Bankstown would look in the year 2028. CB2028 identifies seven destinations that would promote Canterbury-Bankstown	CB2028 aims to address the healthy and active, and moving and integrated destinations to improve the wellbeing and connectivity within the community. East Hills Station upgrade would support of CB2028 by improving accessibility for community members.

Policy / Strategy	Overview	How the Proposal aligns
Bankstown Council, undated)	to be a thriving, dynamic and real community which are: • Safe and strong • Clean and green • Prosperous and innovative • Moving and integrated • Healthy and active • Liveable and distinctive • Leading and engage.	

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

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

Policy / Strategy	Overview	How the Proposal aligns
Future Transport Strategy 2056 (TfNSW, 2018)	*Future Transport Strategy 2056* (the Strategy) is an update of NSW's *Long Term Transport Master Plan*. It is a suite of strategies and plans for transport to provide an integrated vision for the state. The Strategy identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport.	The TAP is identified in the Strategy as an example of the NSW Government working to improve accessibility of the rail network. As identified in the Strategy, the delivery and modernisation of infrastructure would allow greater access for people with disabilities and those with limited mobility. The Proposal would assist in meeting the following State-wide outcomes detailed in Strategy by: • improving and modernising customer experience • improving accessibility • upgrading technology • improving safety • increasing efficiency between travel.
Disability Inclusion Action Plan (2018-2022) (TfNSW, 2017)	The Disability Inclusion Action Plan 2018-2022 (the Plan) was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, which consists of representatives from peak disability and ageing organisations within NSW. The Plan identifies the challenges, the achievements to date, the considerable undertaking that is required to finish the job and provides a solid and practical foundation for future progress over the next five years.	The Proposal would principally deliver on the Plan's key action of creating liveable communities. The Proposal would make the area of East Hills a more liveable community for people with a disability by improving accessibility at East Hills Station and interchange at the station to other transport modes including bus, taxi and private vehicle.
A Metropolis of Three Cities -	The Greater Sydney Region Plan is the NSW Government's 40-year land	The Proposal would enable equitable access to services and employment

Policy / Strategy	Overview	How the Proposal aligns
Greater Sydney Region Plan (Greater Sydney Commission, 2018a)	use plan for Sydney. It establishes a vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City. One of the ten directions of the framework is a well-connected city, by developing a more accessible and walkable city, through optimising existing infrastructure where possible.	as well as social and cultural opportunities through investment in transport. The proposed upgraded streets and infrastructure would promote public transport movements, walking, cycling and social opportunity, which contribute to the character and identity of the area.
South District Plan (Greater Sydney Commission, 2018b)	The South District Plan covers the Bankstown-Canterbury LGA and is a 20-year plan to manage growth in the context of economic, social and environmental matters to meet the 40-year vision for Greater Sydney.	The Proposal would promote connections between the three cities and increase the ability to access a metropolitan centre/cluster in 30 minutes. It would also accommodate for future forecasted population growth.
Building Momentum – State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)	The State Infrastructure Strategy 2018-2038 makes recommendations for each of NSW's key infrastructure sectors including transport. The Strategy recognises that public transport is critical to productivity, expanding employment opportunities by connecting people to jobs and reducing congestion. A key recommendation in the Strategy is to invest in transport infrastructure that is integrated with land use to create opportunities for agglomeration and enhance productivity, liveability and accessibility.	The Proposal would upgrade public transport services to provide access for a wider range of customers. It would also involve the upgrade of existing infrastructure which aligns with an objective of the strategy to optimise the use of the State's existing assets.
Bankstown Complete Streets – CBD Transport and Place Plan (City of Canterbury-Bankstown Council, 2019)	The Bankstown Complete Streets – CBD Transport and Place Plan (the Plan) details an action plan to identify key action items to accommodate population growth, increased development and allow for improved access and safety for pedestrians, motorists and cyclists to key destinations.	The Plan envisages a community that can easily travel to work by accessible, reliable public transport and road infrastructure. The Proposal would support the objectives of the Plan by making East Hills Station more accessible to the community.
The *Canterbury-Bankstown Community Strategic Plan 2028* (CB2028) (City of Canterbury-Bankstown Council, undated)	The Canterbury-Bankstown Community Strategic Plan 2028 (CB2028) was prepared to give an opportunity to community members to identify how Canterbury-Bankstown would look in the year 2028. CB2028 identifies seven destinations that would promote Canterbury-Bankstown to be a thriving, dynamic and real community which are: • Safe and strong • Clean and green	CB2028 aims to address the healthy and active, and moving and integrated destinations to improve the wellbeing and connectivity within the community. East Hills Station upgrade would support of CB2028 by improving accessibility for community members.

Policy / Strategy	Overview	How the Proposal aligns
	• Prosperous and innovative • Moving and integrated • Healthy and active • Liveable and distinctive • Leading and engage.	

2.2 Objectives of the Transport Access Program

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

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

2.3 Objectives of the Proposal

East Hills Station has been identified for an accessibility upgrade as it does not currently meet key requirements of the DSAPT or the DDA. The non-compliant footpaths and stairs to the station entrance and platforms do not facilitate access for people with reduced mobility, parents/carers with prams or customers with luggage.

The Proposal would provide safe and equitable access to the platforms and to the pedestrian network surrounding the station. The specific objectives of the East Hills Station upgrade are to:

- provide a station that is accessible to people with a disability or limited mobility, parents/carers with prams and customers with luggage
- improve customer experience through improved weather protection, interchange facilities and visual appearance
- minimise pedestrian conflict and crowding points
- improve integration with surrounding precinct
- improve customer safety
- improve wayfinding in and around the station
- improve customer amenity

- improve cross corridor access/pedestrian links to Thompson Lane and Maclaurin Avenue.

2.4 Alternative options considered

An option development process was undertaken as part of the scoping design assessment to confirm the preferred option.

2.4.1 The 'do-nothing' option

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

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

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 Canterbury-Bankstown community.

2.4.2 Assessment of identified options

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

Two options were considered to meet the Proposal objectives:

- Upgrade the existing ramps to the island platform and side platform, or
- Construct two new lifts to the island platform and site platform.

Other features, such as the upgrade of station entrances and pathways, reconfiguration of the existing customer toilet facilities and creating a formal kiss and ride were common for both options.

A study was undertaken to investigate the feasibility of making the existing ramps to both the island platform and side platform compliant. It was found that to make the ramps compliant with landings every six metres, the ramps would need to be extended from 50 metres to over 84 metres. This option was deemed not feasible from a customer experience and urban design perspective, as it would significantly increase customer travel distances and require substantial structural changes to the platforms exceeding the existing space limitations.

Minor optioneering was considered for the location of the new lift structures. The preferred location of the underpass lift was designed to be close to the existing retaining wall. This is intended to minimise impacts to the operation of the underpass with respect to the movement of people between the platforms and the station entrances at Park Road and Thompson Lane.

2.5 Justification for the preferred option

Following stakeholder consultation and the assessment of options outlined in Section 2.4.2, only one option was deemed suitable for the Proposal. The preferred option was the construction of two new lifts to the island platform and side platform. The preferred option includes the location of the lift on Platforms 1 and 2 to be central to the platform to allow for ease of access. Similarly, the lift to Platform 3 is situated to be easily accessible from the station underpass adjacent to the Thompson Lane station entry, which also allows for improved maintenance access to the lift shaft. The design would also include the removal of

the fencing in the underpass increasing visibility and accessible space. Overall, the preferred option would:

- achieve DDA compliance and urban design objectives
- have no major impact on existing services
- result in minimal impact on existing vegetation
- improve customer experience.

3 Proposal description

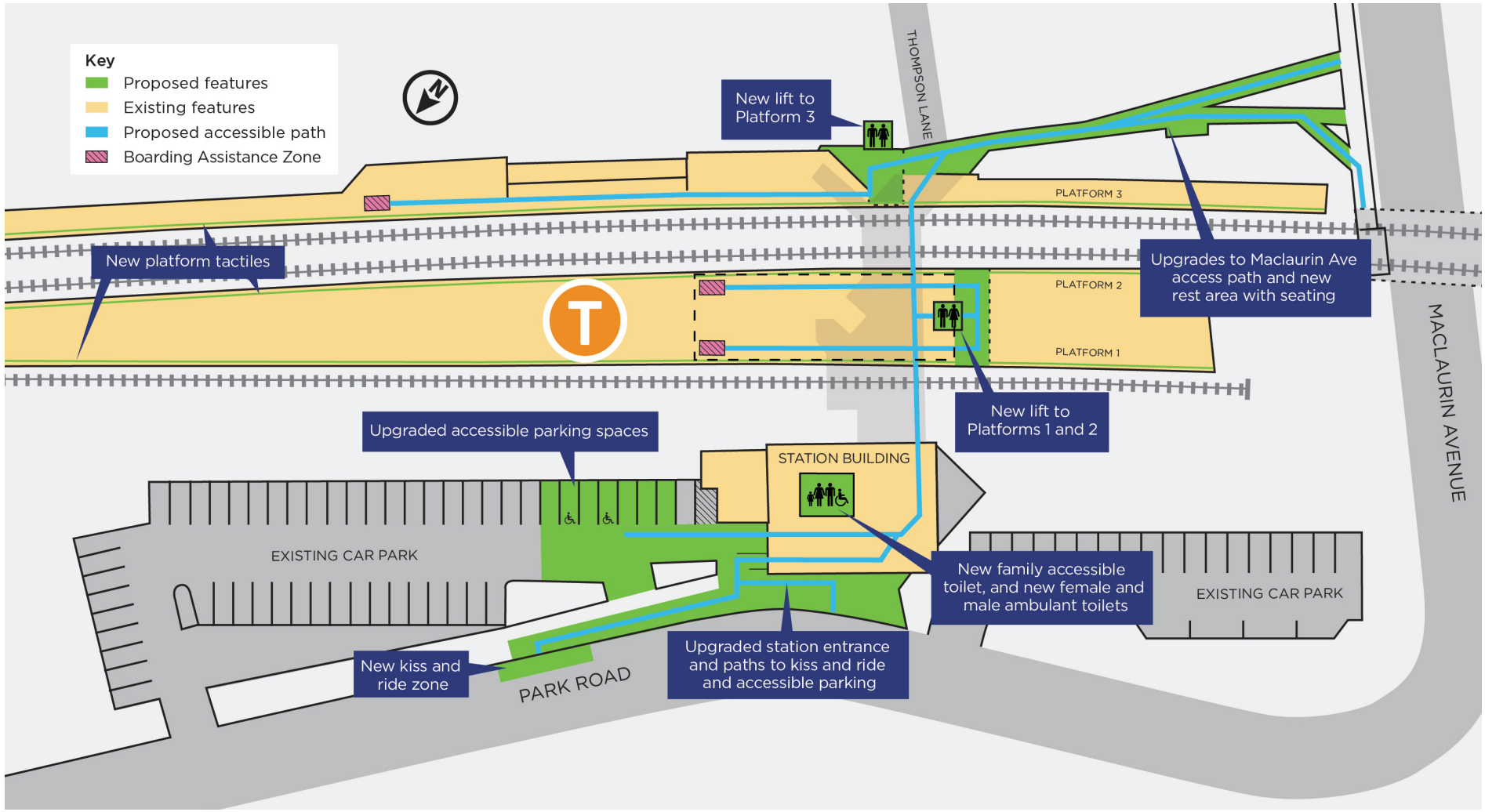
Chapter 3 describes the Proposal and summarises key design parameters and construction methodology. The description of the Proposal is based on the concept design and is subject to detailed design

3.1 The Proposal

The Proposal involves an upgrade of East Hills Station as part of the TAP which would improve accessibility and amenities for customers. The Proposal would include the following key elements:

- construction of two new lifts to provide access between the existing station underpass and the platforms
- upgrade of the existing station entrance on Park Road including:
    - floor regrading and modifications to the entrance with readjustments to bollards and bike hoops
    - upgrade of the existing entry ramp and stairs including upgrade of handrails, stair nosings and tactiles to be compliant with Australian standards and guidelines
    - modifications to the commuter car park along Park Road to allow for the upgrade of the two accessible parking spaces
    - provision of a new kiss and ride space on Park Road adjacent to the taxi zone
- upgrade of the existing station entrance on Thompson Lane including:
    - provision of an accessible pathway between the station underpass, Thompson Lane and Maclaurin Avenue by regrading and modifications to the existing path
    - provision of a new rest area along the accessible pathway
    - internal station building work including:
    - reconfiguration of the existing customer toilet facilities to provide one (1) new unisex Family Accessible Toilet (FAT), one (1) new male ambulant toilet and one (1) new female ambulant toilet
- other minor building modifications that may be required to accommodate new or upgraded electrical equipment including a main switchboard, new or upgraded station communications equipment and other station services
- ancillary work including adjustments to lighting, relocation or replacement of existing customer facilities (platform seating, bins, payphone, Opal card readers, fencing) and improvement to station systems including additional CCTV cameras, hearing loops and wayfinding signage.

Figure 3-1 shows the general layout of the proposed work (indicative and subject to detailed design).



(Indicative only, subject to detailed design)

Figure 3-1 Key features of the Proposal

3.2 Scope of works

3.2.1 Station upgrades

The proposal work at the station to improve accessibility and customer experience would include:

- construction of a new 17 person lift (Lift 1) within the existing underpass, to access island Platform 1 and 2
- construction of a new 17 person lift (Lift 2) to connect the Thompson Lane entry and underpass to Platform 3
- construction of a new platform canopy extension from the existing Platform 1 and 2 canopy to cover the new lift entry
- construction of new canopies at the lift lobbies to provide sheltered waiting space at both the platform level and street level for Lift 2
- construction of a new lift lobby and walkway at platform level linking Lift 2 to Platform 3
- provision of new hearing loops on the platforms
- removal of the existing fences in the concourse (fence separating paid and unpaid concourse areas)
- upgrades to the existing stairs between the underpass and platforms to achieve compliance
- replacement of tactiles along all platform edges and repainting of the platform safety zone
- reconfiguration of the existing customer toilet facilities to provide one (1) new unisex Family Accessible Toilet (FAT), one (1) new male ambulant toilet and one (1) new female ambulant toilet
- replacement of water fountains on Platform 2 and in the underpass with accessible water fountains
- relocation of Opal card readers within the underpass
- regrading of the station underpass to provide accessible paths between station amenities including:
    - lifts
    - stairs
    - payphone
    - Ticket Vending Machine (TVM, Opal top up machine)
    - Opal card readers
    - food/drink vending machines
    - toilets.

3.2.2 Park Road station entrance

The proposed work to the Park Road station entry include:

- upgrades to the existing ramp and stairs at the Park Road station entrance, including extending the ramp to provide compliant gradients and landings, upgraded handrail, stair nosings and tactiles
- provision of two upgraded accessible parking spaces including new line marking, signage, bollards as required in the Park Road commuter car park
- provision of an accessible path between the upgraded accessible parking spaces and the station; including localised regrading of the car park and station entry, and relocation of the bike hoops and bollards within the station entry
- provision of a new kiss and ride parking space on Park Road located near the taxi zone
- regrading of footpaths to provide paths connecting the station entry at street level to:
    - Bus Stop 221313 East Hills Station, Park Road
    - the new kiss and ride and taxi zone.

3.2.3 Thompson Lane station entrance

The proposed work to the Thompson Lane station entry include:

- upgrades to the pathway and landscaping between the station underpass, Thomson Lane and Maclaurin Avenue to provide accessible paths to Maclaurin Avenue shops and Bus Stop 2213115 East Hills Station, Maclaurin Avenue
- provision of a new rest area along the path to Maclaurin Avenue including seating
- modifications to the barriers at the Thompson Lane underpass entrance.

3.2.4 Station building modifications

The proposed station building modification work would include:

- reconfiguration of the existing customer toilet facilities to provide one (1) new unisex Family Accessible Toilet (FAT), one (1) new male ambulant toilet and one (1) new female ambulant toilet
- other minor building modifications that may be required to accommodate new or upgraded electrical equipment including a main switchboard, new or upgraded station communications equipment and other station services.

3.2.5 Ancillary work

The following ancillary work is required as part of the upgrade:

- electrical upgrade work, which could include an upgrade to the existing transformers, main switch board and station distribution boards, and earthing/bonding provisions as required to accommodate the power requirements for the proposal (specific power requirements to be determined during detailed design)
- new stormwater drainage connections from the new lifts and canopy to the existing stormwater system

- services and utilities protection, adjustments and/or relocations to accommodate the new work
- lighting upgrades as required for the new work
- improvement to station security and communication systems, including modification to CCTV, public address system, and station passenger information systems as required for the new work.
- relocation of station furniture including but not limited to seats, boarding ramp cabinets, planter boxes, rubbish bins and lighting as required
- provision of wayfinding signage and other station signage as required for the new work
- temporary site compounds for construction team site sheds and facilities, and storage of materials and equipment near Thompson Lane. Tree removal and trimming would be required to accommodate the site compound
- provision of temporary construction and laydown areas on the platforms, in the underpass and in the commuter car parks
- temporary work (where required) to maintain access to the station.

3.2.6 Materials and finishes

Materials and finishes for the Proposal have been selected based on the criteria of durability, low maintenance and cost effectiveness, to minimise visual impacts, and to be aesthetically pleasing. Consideration has also been given to life cycle and sustainability impacts which are calculated by assessing the environmental impacts of materials from the point of extraction, through to transportation, use, operation and end of life.

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

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

- lift shafts – concrete lift shaft with glazing
- platform canopies – steel canopies similar to existing platform canopies
- handrails – stainless steel.

The source and quantity of materials would be determined during the detailed design phase of the Proposal and would consider the requirements for ISCA IS rating tool v1.2 (ISCA, 2017). Materials would be sourced from local suppliers where possible. Reuse of existing and recycled materials would be undertaken where possible.

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

3.3 Design development

3.3.1 Engineering and environmental 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 include the existing platforms, station buildings, canopies, stairs, ramps and the underpass retaining structures
- 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
- Vegetation: the Proposal has been designed to minimise impact to mature and semi-mature trees located around the station
- Utilities: detailed site survey and Dial Before You Dig (DBYD) searches have identified a number of utilities in the vicinity of the proposed works including:
    - ethane gas pipeline passing along the Park Road Station entrance
    - rail utilities including signalling infrastructure and cabling, communications optic fibre, high voltage and overhead wiring
    - water, stormwater and sewer services
    - services in the platform including electrical and communications infrastructure
- Construction access: customer access to the station would be maintained throughout the construction period. When required, underpass closures to allow for construction would take place during scheduled rail possessions. For specific construction activities, construction access would require traffic control in the adjacent streets and the use of a large mobile crane may be required to lift construction materials and equipment to the station from these streets.

3.3.2 Design standards

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

- *Disability Standards for Accessible Public Transport 2002* (issued under the Commonwealth *Disability Discrimination Act 1992*)
- National Construction Code
- relevant Australian Standards
- Transport for NSW Asset Standards Authority standards
- Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability (IS) Rating Scheme (v1.2)
- Transport for NSW Urban Design Guidelines
- *Guidelines for the Development of Public Transport Interchange Facilities* (Ministry of Transport, 2008)
- Crime Prevention Through Environmental Design (CPTED) principles

- other Transport for NSW policies and guidelines
- Sydney Trains standards and guidelines
- Council standards, codes and guidelines (where relevant).

3.3.3 Sustainability in design

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

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

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

The Sustainability Strategy sets targets across the following key issues:

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

Key design elements and strategies developed during scoping design will be used to further develop the design and construction.

3.4 Construction activities

3.4.1 Work methodology

Subject to approval, construction is expected to commence in mid 2021 and take up to 18 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with Transport for NSW.

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

Table 3-1 Indicative construction staging for key activities

Stage	Activities	Timing
Site establishment and enabling work	• site investigations and survey • establish site compounds (erect fencing, tree protection zones, site offices, amenities, plant and material storage areas) • removal and trimming of trees to allow for the site compound, footpath work and lift construction • relocate or upgrade utility / services where required • establish crane and piling rig • install safety barriers, lighting, hoarding around nominated work areas • establish traffic control measures.	• Standard construction hours (7am to 6pm Monday to Friday and 8am to 1pm Saturday).
Lift construction	• establish lift constriction areas on platforms and in the underpass • excavate lift foundations • piling, waterproofing (as required), installation of reinforcement, formwork and concrete to form the lift pit • construction of lift shaft structures, • construction of new landing between Lift 2 and Platform 3 • installation of cantilevered awnings to Lift 2 • lift installation and commissioning.	• Standard hours, night works and 48-hour rail possessions during Sydney Trains planned maintenance weekends.
Platform work	• install new yellow line and tactiles along platforms • relocation of platform furniture including seats, rubbish bins, and planter boxes • upgrade drinking fountain on platform 2 for accessibility • ancillary work including adjustment to lighting, electrical upgrades, improvement to station communications systems (including CCTV cameras), public address, hearing loops, and wayfinding signage.	• Standard hours, and 48-hour rail possessions during Sydney Trains planned maintenance weekends.
Station building work	• reconfiguration of existing male and female toilets to provide a FAT one male ambulant and one female ambulant toilet • upgrade the stairs and handrails to the platforms and entrances • install footings for ramp and bike hoops at the Park Road station entrance • upgrade ramp at park road station entrance • relocate bike hoops.	• Standard hours, and 48-hour rail possessions during Sydney Trains planned maintenance weekends.

Stage	Activities	Timing
Park Road parking, kiss and ride and pedestrian work	• construction of DDA compliant car spaces • construction of pathways to link car park and station entrance • construction of a new pedestrian ramp between the commuter car park and station entrance.	• Standard hours, and 48-hour rail possessions during Sydney Trains planned maintenance weekends.
Maclaurin Avenue footpath	• demolition/excavation of existing non-compliant footpath • construction and regrading of footpath area to tie into existing footpath.	• Standard construction hours.
Site demobilisation	• civil/lighting work • test and commission CCTV cameras/station systems installation • test and commission new lifts/open to the public • finishing work including landscaping, fencing and wayfinding • reinstatement of platform furniture • clearing of site.	• Standard construction hours.

3.4.2 Plant and equipment

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

- hand tools
- power tools (e.g. drill, hammer drill, saw, grinders, torque and impact wrenches)
- dump trucks
- chainsaw
- generators
- lighting tower
- hirail plant (e.g. rail mounted elevated work platform, flatbed truck, hiab crane trucks, and dump trucks etc.)
- elevated work platform (EWP)
- scaffolding
- coring machine
- mulcher
- bobcat
- excavator
- demolition saw
- hydraulic/rock saw
- concrete pump
- concrete truck
- drilling and piling rigs
- skip trucks
- mobile crane
- asphalt paving machine
- road saw
- forklift
- trucks
- vibrating roller/compaction plate.

3.4.3 Working hours

Most of the work required for the Proposal would be undertaken during standard (NSW) construction hours, which are as follows:

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

Work outside of standard hours may be required occasionally at night, on weekends and during scheduled Sydney Trains rail possessions. These are scheduled line closures that would occur regardless of the Proposal when part of the rail network is temporarily closed for maintenance and trains are not operating.

Out of hours work is 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 up to four rail possessions would be required to facilitate the following:

- site survey and service location investigations within and around the rail corridor
- installation of the lift shaft and canopy structures
- tactile installation to platforms.

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

3.4.4 Earthworks

Excavations and earthworks would generally be required for the following:

- construction of the lift pits
- localised underpass and access path regrading works
- upgrade of the pedestrian ramp at the Park Road entrance
- regrading of the commuter car park for the upgrade accessible spaces and access path
- other minor civil works including footings and foundations for structures, drainage / stormwater works, and trenching activities for service adjustments and relocations.

Excavated material would be reused onsite where possible or disposed of in accordance with relevant legislative requirements. The detailed design would confirm the volume of excavated material to be generated by the proposed work.

3.4.5 Source and quantity of materials

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

3.4.6 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:

- minor disruptions to pedestrian/cyclist movements in and around the station
- higher road safety risk levels associated with construction vehicle-pedestrian interactions
- minor increase in traffic on the local road network
- temporary road closures on Thompsons Lane to facilitate set up area for site compound and cranes.
- reduced parking spaces due to the partial closure of the Park Road commuter car park during upgrade work to the accessible parking spaces, and as required to support construction of the station upgrade.

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

3.4.7 Ancillary facilities

A temporary construction compound would be required to accommodate a site office, amenities, laydown and storage area for materials. An area for a construction compound has been proposed along Thompson Lane (refer to Figure 3-2). The area nominated for the compound is on land owned by Transport for NSW.

Additionally, an area in the southern car park on Park Lane would be used for material laydown, storage, assembly and general site support. The area adjacent to Park Road would be utilised as a rail access point during the construction of the Proposal. Location of the proposed ancillary facilities are shown in Figure 3-2.

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

3.4.8 Public utility adjustments

The Proposal has been designed to avoid relocation of services where feasible, however further investigation may be required. It is unlikely that public utility services would be required as part of this Proposal. In the event that work would be required to relocate public utilities outside the works considered by this REF, further assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase.

3.5 Property acquisition

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

3.6 Operation and maintenance

The future operation and maintenance of the East Hills Station is subject to further discussions with Sydney Trains, Transport for NSW and City of Canterbury-Bankstown Council. Structures constructed under this Proposal would be maintained by Sydney Trains

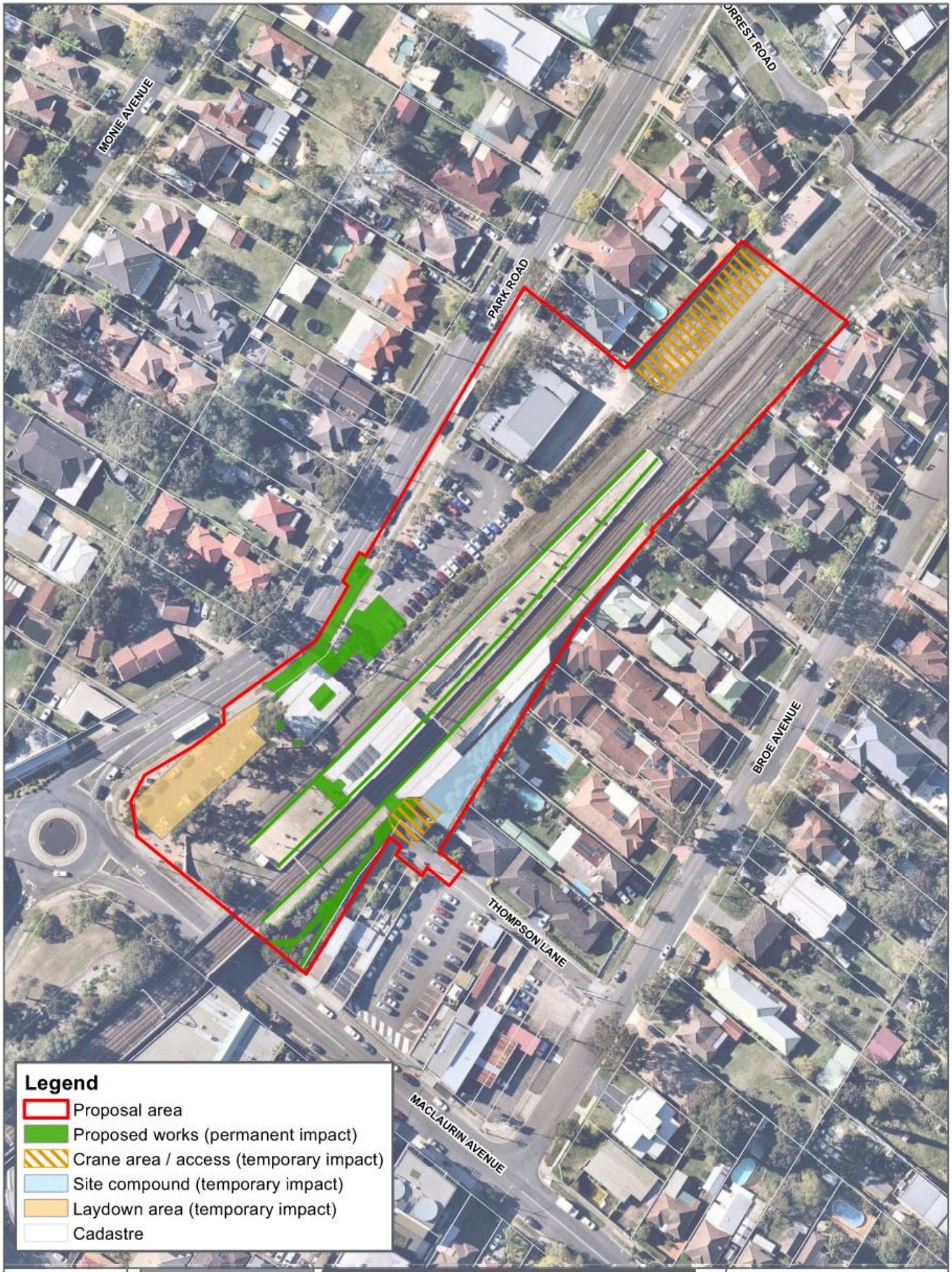


FIGURE 3-2

1:1,500 Scale at A4

m

0 10 20 30 40

Proposed site compound area and works zone

EAST HILLS STATION

N

Map Produced by Cardno NSW/ACT Pty Ltd (WDL)
Date: 2020-11-12 | Project: NE30047
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30047-GS-001-SiteCompoundWorks.mxd 03
Aerial imagery supplied by Nearmap (October, 2020)
Cadastre supplied by NSW SS

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 (EPIs), and Commonwealth legislation.

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

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

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

4.1.2 Other Commonwealth legislation

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

Table 4-1 Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	There is an obligation on a person who discovers anything which he or she has reasonable grounds to suspect are Aboriginal remains to report that discovery to the Minister, giving particulars of the remains and their location. The Proposal does not include any previously identified Aboriginal sites and/or places (refer Section 6.4); however, considerations for unexpected finds further detailed in mitigation measures and applies to this Act.
Disability Discrimination Act 1992 (DDA)	This Act aims to eliminate as far as possible, discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land. The Proposal would be designed having regard to the requirements of this Act. The key objective of the Proposal is to improve the accessibility of East Hills Station which is consistent with the objectives of this Act.

4.2 NSW legislation and regulations

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

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

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

b) to promote the integration of the transport system

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

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

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

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

Clause 2B (common objectives and service and delivery priorities of public transport agencies of the TAA), specifies:

(a) Environmental sustainability

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

(b) Social benefits

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

4.2.1 Environmental Planning and Assessment Act 1979

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

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

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

4.2.2 Other NSW legislation and regulations

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

Table 4-2 Other legislation applicable to the Proposal

Applicable legislation	Considerations
Biodiversity Conservation Act 2016 (BC Act) (NSW)	The BC Act establishes a framework for assessing and protecting environmental and public interests. 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).

Applicable legislation	Considerations
Biosecurity Act 2015 (NSW)	Clause 22 requires any person who deals with a biosecurity matter has a duty to ensure that in so far as is reasonably practicable, the potential biosecurity risk is prevented, eliminated or minimised. Appropriate management methods would be implemented during construction if declared noxious weeds in the Canterbury-Bankstown LGA are identified (refer to Section 6.7).
Contaminated Land Management Act 1997 (CLM Act) (NSW)	Section 60 of the CLM Act imposes a duty on landowners to notify the Department of Planning, Industry and Environment (DPIE) and potentially investigate and remediate land if contamination is above Environment Protection Authority (EPA) guideline levels. The Proposal site has not been declared under the CLM Act as being significantly contaminated (refer to Section 6.8).
Crown Lands Act 1987 (NSW)	The Proposal does not involve work on any Crown land.
Heritage Act 1977 (Heritage Act) (NSW)	Sections 57 and 60 of the Heritage Act require approval for work that may have an impact on items listed on the State Heritage Register. Sections 139 and 140 of the Act similarly require approval where relics are likely to be exposed Section 170 where items listed on a government agency Heritage and Conservation Register are to be impacted. No items of state heritage significance were identified near the Proposal, and therefore an approval under the above sections of the Heritage Act would not be required.
National Parks and Wildlife Act 1974 (NPW Act) (NSW)	Sections 86, 87 and 90 of the NPW Act require consent from DPIE for the destruction or damage of 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 work would cease and appropriate advice sought. Additionally, as identified in Table 5-1, the Proposal would not involve impacts to land reserved for, or adjacent to, land reserved under the NPW Act.
Protection of the Environment Operations Act 1997 (PoEO Act) (NSW)	The Proposal does not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, Transport for NSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the 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 work on Thompson Lane and Park Road which are not classified roads. No approvals under the Roads Act are expected to be required for the Proposal. Should any Road Occupancy Licences (ROL) be required as part of the proposal, Transport for NSW would liaise with City of Canterbury-Bankstown Council to determine the scope and requirements.
Sydney Water Act 1994 (NSW)	The Proposal would not involve discharge of wastewater to the sewer.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW)	Transport for NSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared during the detailed design (refer to Section 6.11).
Water Management Act 2000 (NSW)	Approval under the *Water Management Act 2000* is required for certain types of developments and activities that are carried out in or near a river, lake or estuary. Under section 91E of the Water Management Act 2000, it is an offence to carry out a controlled activity in, on or under waterfront land unless a controlled activity approval has been issued. 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.

4.2.3 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

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

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

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

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

> *(a) 'railway tracks, associated track structures, cuttings, drainage systems, fences, tunnels, ventilation shafts, emergency accessways, bridges, embankments, level crossings and roads, pedestrian and cycleway facilities.'*
>
> *(d) 'railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms'*
>
> *(e) public amenities for commuters*

(f) associated public transport facilities for railway stations…'

Consequently, development consent is not required for the Proposal which is classified as a rail infrastructure facility, however the environmental impacts of the Proposal have been assessed under the provisions of Division 5.1 of the EP&A Act.

Part 2 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other agencies prior to the commencement of certain types of development. Section 5.2 of this REF discusses the consultation undertaken under the requirements of the Infrastructure SEPP.

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

State Environmental Planning Policy 55 – Remediation of Land

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

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

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

State Environmental Planning Policy – Coastal Management

State Environmental Planning Policy (Coastal Management) 2018 (CM SEPP) commenced on 3 April 2018 and replaced State Environmental Planning Policy No 14 – Coastal Wetlands, State Environment Planning Policy No 26 - Littoral Rainforest and State Environment Planning Policy No 71 - Coastal Protection.

CM SEPP promotes an integrated and coordinated approach to land use planning in the coastal zone in a manner consistent with the objects of the *Coastal Management Act 2016*. The Proposal area does not include any land identified under this SEPP. The nearest land identified as coastal environment area under the CM SEPP is located about 110 metres to the north west of the Proposal area. Downstream indirect effects on these areas are considered in Section 6.7.

4.2.4 Bankstown Local Environmental Plan 2015

The Proposal is located within the Canterbury-Bankstown LGA. The Infrastructure SEPP prevails over all other environmental planning instruments (such as LEPs) except where there is an inconsistency with the *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018.*

There is a planning proposal seeking to produce a single set of planning rules by combining and aligning *Bankstown Local Environmental Plan 2015* (Bankstown LEP 2015) and the *Canterbury Local Environmental Plan 2012* (Canterbury LEP 2012) into a consolidated LEP. When finalised, the Consolidated LEP will be a legal planning instrument used by planning

authorities when assessing development applications. It will apply to the Canterbury-Bankstown LGA.

During the preparation of this REF, the provisions of the Bankstown LEP 2015 were considered.

The Bankstown LEP 2015 is the governing plan for the Canterbury-Bankstown LGA, including East Hills. Table 4-3 summarises the relevant provisions of the Bankstown LEP 2015 applicable to the Proposal.

Figure 4-1 shows the location of the Proposal area for the Proposal in the relevant zoning map from the Bankstown LEP 2015.

Table 4-3 Relevant provisions of the Bankstown LEP 2015

Provision description	Relevance to the Proposal
Clause 2.3 – Zone objectives and Land Use Table	Under the Bankstown LEP, the rail corridor is zoned as SP2 Infrastructure – Railway. The Proposal is consistent with the objectives of the SP2 Infrastructure zoning as it would provide required infrastructure to the community in the form of works to improve accessibility.
Clause 6.1 - Earthworks	Clause 6.1 of the Bankstown 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. The Proposal is permissible without development consent and would be approved under Part 5 of the EP&A Act.

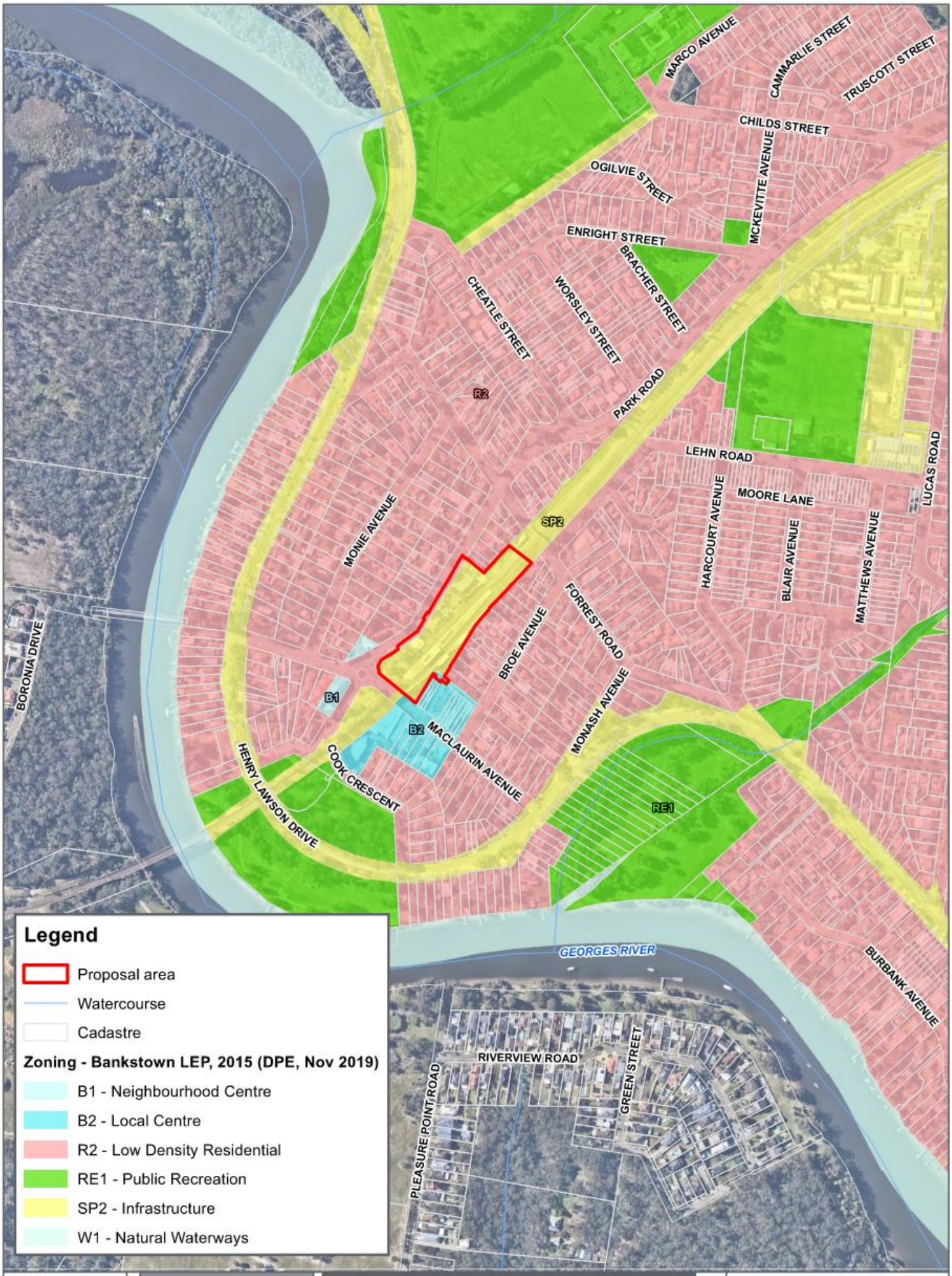


FIGURE 4-1

1:7,000 Scale at A4

m

0 25 50 75 100

Bankstown LEP Zoning

EAST HILLS STATION

N

Map Produced by Cardno NSW/ACT Pty Ltd (WDL)
Date: 2020-11-12 | Project: NE30047
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30047-GS-004-Zoning.mxd 02
Aerial imagery supplied by Nearmap (October, 2020)
Watercourses and Cadastre supplied by NSW SS

4.3 Ecologically sustainable development

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

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

The principles of ESD have been adopted by Transport for NSW throughout the development and assessment of the East Hills Station. Section 3.3.3 summarises how ESD would be incorporated in the design development of the Proposal. Sections 6.12 and 6.13 includes an assessment of the Proposal on sustainability and climate change, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5 Community and stakeholder consultation

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

5.1 Stakeholder consultation during concept design

Key stakeholders, relevant Transport for NSW teams, Sydney Trains and City of Canterbury-Bankstown Council, were engaged in the development of the Proposal to provide insights into the scope of work for the Proposal and to also participate in the development and assessment of the station improvement options.

Early community engagement was undertaken between 23 September and 14 October 2020 to provide the community an opportunity to have their say on the early concept design. Transport for NSW advertised this early engagement period via:

- community notifications distributed to the suburb of East Hills
- advertisement on Facebook
- posters installed at the station
- a dedicated project webpage with an online form inviting feedback.

Community sentiment was supportive of the proposed scoping design. A total of 59 comments were received during the concept design engagement period. The feedback received from the community was provided to the project team for consideration as part of design development.

Workshops and meetings carried out during the design development included:

- meeting with City of Canterbury-Bankstown Council
- meeting with Sydney Trains to discuss potential design consideration and proposed rail possessions
- constructability review workshops
- safety in design workshops including hazard identification and security risk workshops.

5.2 Consultation requirements under the Infrastructure SEPP

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

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

Table 5-1 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13: Consultation with Councils –	Consultation is required where the Proposal would result in:	The Proposal includes work that would:

Clause	Clause particulars	Relevance to the Proposal
development with impacts on council related infrastructure and services	• 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.	• disrupt pedestrian and vehicle movements • impact on road pavements under Council's care and control • impact on Council-operated footpaths. Consultation with City of Canterbury-Bankstown Council has been undertaken and would continue to be undertaken throughout the public display, detailed design and construction phases of the Proposal.
Clause 14: Consultation with Councils – development with impacts on local heritage	Where railway station work: • substantially impact on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area.	East Hills Station is not listed on the Bankstown LEP 2015 heritage schedule. There is no proposed impact to local heritage/heritage conservation area. Accordingly, consultation with City of Canterbury-Bankstown Council is not required. Refer to Section 6.5.
Clause 15: Consultation with Councils – development with impacts on flood liable land	Where railway station work: • impact on land that is susceptible to flooding – reference would be made to *Floodplain Development Manual: the management of flood liable land*.	The Proposal is located within a flood risk area (BMT WBM, 2009). Refer to Section 6.9. While the Proposal is unlikely to alter flood patterns, Transport for NSW would consult with City of Canterbury-Bankstown Council throughout the public display, detailed design and construction phases of the Proposal.
Clause 15A: Consultation with Councils – development with impacts on certain land within the coastal zone	Where railway station work: • impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land.	East Hills Station is not located on land within the coastal zone. Consultation with City of Canterbury-Bankstown Council is not required in regard to this aspect.
Clause 15AA: Consultation with State Emergency Service – development with impacts on flood liable land	Where railway station work: • impact on flood liable land -written notice must be given (together with a scope of works) to the State Emergency Services and taken into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given.	The Proposal is located within a flood risk area (BMT WBM, 2009). Refer to Section 6.9. While the Proposal is unlikely to alter flood patterns, Transport for NSW would consult with the State Emergency Service throughout the public display, detailed design and construction phases of the Proposal.

Clause	Clause particulars	Relevance to the Proposal
Clause 16 | Consultation with public authorities other than Councils	For *specified development* which includes consultation with the EES for development that is undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974*, and other agencies specified by the Infrastructure SEPP where relevant. Although not a specific Infrastructure SEPP requirement, other agencies Transport for NSW may consult with could include: • Sydney Trains • NSW Train Link • DPIE.	Consultation with other public authorities as specified in this clause is not required. However, consultation with Sydney Trains would be ongoing through the next stages of the Proposal.

5.3 Consultation strategy

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

The objectives of the consultation strategy are to:

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

5.3.1 Public display

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

- a dedicated webpage for the project on the Transport for NSW website with an online feedback form
- public display of the REF on the project webpage
- installation of posters at the station with quick response (QR) codes taking customers to the project webpage
- distribution of a project newsletter to the local community outlining the Proposal and inviting feedback on the REF
- advertisement of the REF public display in local newspapers with a link to the Transport for NSW website that includes a summary of the Proposal and information on how to provide feedback
- consultation with City of Canterbury-Bankstown Council and Sydney Trains and other non-community stakeholders
- a geo-targeted social media campaign during the public display period
- phone calls and emails to members of the community who have registered to be on the project mailing list.

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

The REF would be placed on public display on the Transport for NSW website[1] and NSW Government Have your say website[2]. Under normal circumstances, printed copies of the REF would be available at varying locations. However, due to the COVID-19 restrictions, these will not be available for this Proposal.

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

- Email: projects@transport.nsw.gov.au
- Write to: Transport Access Program - East Hills Station Upgrade
  Associate Director Environmental Impact Assessment
  Transport for NSW
  PO Box K659
  Haymarket NSW 1240
- Fill in online feedback form at transport.nsw.gov.au/easthills

Further information on the Proposal would be available through the Project Infoline (1800 684 490) or by emailing: projects@transport.nsw.gov.au.

[1] www.transport.nsw.gov.au/easthills
[2] www.yoursay.transport.nsw.gov.au/easthills

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

5.4 Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal plus a one kilometre radius, on 17 September 2020. The closest Aboriginal site was one kilometre away and would not be impacted by the Proposal.

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

5.5 Ongoing consultation

At the conclusion of the public display period for this REF, Transport for NSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by Transport for NSW before determining whether to proceed with the Proposal (refer Figure ES-3).

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

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

5.6 Effects of COVID-19 on engagement

In response to the evolving COVID-19 situation, Transport for NSW is following NSW Health advice and changing the way it approaches community consultation for important transport infrastructure projects. This has meant limiting face-to-face engagement with the community and moving towards an online engagement platforms where appropriate.

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 Transport and Access Report was prepared by Aurecon in December 2018 for the Proposal which considers the existing station access arrangements and how future growth, mode shift and improved accessibility would drive the design and provision of future facilities at East Hills Station.

6.1.1 Existing environment

Station access

East Hills Station consists of one side platform and one island platform. Access to East Hills Station is provided via a pedestrian underpass which connects both Park Road and Thompson Lane entries to the platforms via stairs and a ramp. The existing access is not DSAPT compliant (refer Section 1.1.1).

Surrounding road network

East Hills Station is accessed by Park Road, Maclaurin Avenue and Thompson Lane. Park Road is a two-way road running parallel to the rail corridor and connects Revesby to the north and Pleasure Point to the south. There is a roundabout intersection which connects Park Road and Maclaurin Avenue located southwest of the Proposal area. Maclaurin Avenue is local a two-way road which underpasses the rail corridor and connects to Henry Lawson Drive. Thompson Lane is a local one-lane road which connects to Broe Avenue.

Parking

East Hills Station has two dedicated commuter car parks. A commuter car park accessed from Park Road consisting of 48 car spaces with two non-compliant accessible spaces. A second commuter car park is located to the south of the Park Road station entrance on the corner of Maclaurin Avenue which provides 20 car parking spaces. The location of the dedicated commuter car parks are shown in Figure 6-1.

A Council car park is accessible from Thompson Lane which is used to access the local businesses along Maclaurin Avenue. The car park consists of 39 car spaces with two accessible spaces, which are untimed.

There is on-street parking on Park Road and Maclaurin Avenue (to the west of the Park Road and Maclaurin Avenue intersection) which is untimed. There is a combination of 15 minute and one hour timed parking along Maclaurin Avenue where the commercial businesses are located. This parking would likely be used for a variety of reasons including parking for commuters using East Hills Station, and for people accessing the commercial and residential areas.

Figure 6-1 East Hills Station dedicated commuter car parks

Public transport

Rail

East Hills Station is served by Sydney Trains services as part of the T8 Airport and South Line which runs from Macarthur to the City via the Airport or Sydenham. Weekday morning peak (6am to 10am) train operations, based on the existing timetable information as published on the Sydney Trains website, indicates the following frequency of train services:

- Macarthur to City via Airport or Sydenham (eastbound) – 17 services with an average of 13-15 minutes between services during the morning peak (6am to 10am)
- City to Macarthur via Airport or Sydenham (westbound) – 18 services with an average of 13-15 minutes between services during the morning peak (6am to 10am).

Weekday afternoon peak (3pm to 7pm) train operations are based on the existing timetable information as published on the Sydney Trains website, indicates the following frequency of train services:

- Macarthur to City via Airport or Sydenham (eastbound) – 16 movements with an average of 13-15 minutes between services during the afternoon peak (3pm to 7pm)
- City to Macarthur via Airport or Sydenham (westbound) – 16 movements with an average of 13-15 minutes between services during the afternoon peak (3pm to 7pm).

Patronage data of morning peak and afternoon peak travel demands based on data from Transport for NSW in 2017 are summarised in Table 6-1.

Table 6-1 Current travel demands for East Hills Station in 2017 – morning peak and afternoon peak

Station	Average weekday	Average weekday peak 1 hour (8am to 9am)	Average weekday AM peak (6am to 10am)	Average weekday PM peak (3pm to 7pm)
East Hills	1819	162	511	392

Taxi and kiss and ride facilities

There is an existing taxi zone along Park Road north of the station entry.

East Hills Station does not have a formal kiss and ride zone, however the existing no parking zone on Park Road adjacent to the station entrance is used as an informal kiss and ride area..

Bus services

There are three bus stops in the vicinity of East Hills Station which are operated by Transdev and service the station (refer Figure 1-2). Bus routes include:

- 922 East Hills to Bankstown – stops at Park Road outside the station
- 924 East Hills to Bankstown via Panania – stops at Maclaurin Avenue underneath the railway bridge
- 925 East Hills to Lidcombe via Bankstown – stops on either side of Park Road
- N40 East Hills to City Town Hall – stops at Park Road southbound.

Pedestrian infrastructure

East Hills Station has adequate footpath connectivity with the wider area. There are footpaths along both sides of Park Road which extend and continue to Maclaurin Avenue. Pedestrian refuges are located on Park Road and on either side on of the roundabout on Maclaurin Avenue. The cross-corridor link connecting Park Road and Thompson Lane provides pedestrians a dedicated pedestrian path to cross the rail corridor and access the shops on the other side of the station. The ramp on the east side of Maclaurin Avenue near the roundabout provides access to the station from the bus stop on Maclaurin Avenue.

Cyclist infrastructure

Park Road is identified on Transport for NSW's Cycleway Finder tool as a low-difficulty on-road bike route. A bike rack is provided near the station entrance from the main car park on Park Road, and a secure bike locker is provided in the Park Road commuter car park. There are additional bike hoops closer to the Park Road station entrance.

6.1.2 Potential impacts

a) Construction phase

Traffic

The construction traffic generated by the Proposal would be up to 15 heavy vehicle and 30 light vehicle movements per day during standard construction hours. During rail possessions, construction vehicle movements would increase to about 60 light vehicles and 20 heavy vehicle movements per day.

Most construction traffic would be due to construction workers travelling to and from the Proposal area using the local road network.

Heavy vehicles would be required for the delivery and removal of materials, plant and equipment. Heavy vehicles would likely travel from the M5 motorway along Henry Lawson Drive to the Proposal area. Alternatively, heavy vehicles may travel to site via Alfords Point Road and Henry Lawson Drive. Additional vehicle movements as a result of the Proposal are not expected to significantly increase traffic volumes on these roads and are unlikely to impact performance of the surrounding road network and intersections.

The M5 motorway, Henry Lawson Drive and Alfords Point Road are State roads and are considered to have sufficient capacity to accommodate the temporary increase in construction activity from the proposed work. The final construction haulage route would be determined by the nominated Contractor during the detailed design of the Proposal.

Work in the vicinity of the Park Road station entrance including construction of the footpath, kerb ramp, accessible parking and kiss and ride spaces and use of the temporary laydown area may result in traffic impacts and temporary traffic management controls such as lane closures.

There would likely be traffic impacts on Thompson Lane during set up of the site compound area (i.e. delivery of site sheds) and delivery of materials throughout the construction period. In addition, setup and use of a crane for at the end of Thompson Lane would result in traffic impacts. Temporary traffic management controls would be required during these periods.

A Road Occupancy Licence for temporary road closures may be required.

Parking

The proposed construction work, including construction site and access points, would be designed to avoid impacts on parking provisions (where possible). Temporary loss of up to 20 spaces is expected within the commuter car park to the north of the Park Road station entrance during the construction of two compliant accessible parking spaces and access path, however, the loss in parking is expected to be short term (approximately two months).

The commuter car park to south of the Park Road station entrance may result in the temporary loss of up to 20 car parking spaces to accommodate for a lay down area for materials to be used during the construction of the Proposal. The temporary loss of parking would be for the duration of construction.

Construction workers may contribute to a minor increase in demand for local parking and would be required to park away from the station or within the nominated construction compounds, and encouraged to car pool where practicable.

Public transport and pedestrians

During construction of the Proposal, it is expected there would be minor impacts on the surrounding pedestrian and cycle network due to the restricted environment and workspace available for the construction work. It is expected that there may be restrictions and disruptions to pedestrian and cyclist movements as a result of the following construction activities:

- installation of the lift adjacent to Platform 3 along Thompson Lane would impede customer access during the construction
- upgrading the existing stairs between the underpass and Platform 1/2 and Platform 3 would impede customer access to these platforms
- upgrading of the footpaths along Park Road and Maclaurin Avenue would impede customer access to the station and access to the bus stop.

Construction work to be undertaken in close proximity to the existing footpaths and cycle facilities would occur infrequently with closures expected to be temporary, with safe and suitable detours provided as a part of the construction traffic control management to be implemented during the construction period.

Property access

Access to adjoining properties would be maintained at all times and any impacts would be short-term during construction (unless agreed with the property owner(s) in advance). Should the detailed design and construction staging of the Proposal identify impacts to residents and businesses, affected occupants would be consulted and notified in advance of the scheduled work.

Emergency vehicle access

Access for emergency vehicles would be maintained at the construction sites in accordance with emergency vehicle requirements. Emergency services would be advised of all planned changes to traffic arrangements prior to applying the changes. Advice would include information about upcoming traffic disruptions, anticipated delays to traffic, extended times of work and locations of any road possessions.

b) Operational phase

Future patronage projections for East Hills Station have been modelled up to the year 2036 to determine what the potential traffic and transport impacts would be for the station and Proposal area.

Patronage data of morning peak and afternoon peak travel demands, based on data from Transport for NSW, in 2036 shows that there would be a 17 per cent increase in passengers using East Hills Station as mode of transport as shown in Table 6-2.

Table 6-2 Rail passenger projections 2036

Station	Average weekday	Average weekday peak 1 hour (8am to 9am)	Average weekday AM peak (6am to 10am)	Average weekday PM peak (3pm to 7pm)
East Hills	2124	189	597	548

By 2036, about 65 per cent of East Hills Station users would walk to and from the station with 27 per cent arriving by car either by kiss and ride or utilising the commuter car parks. With the remaining eight per cent arriving by bus. Based on the capacity of the existing road network it is not anticipated that this growth in patronage would have a significant impact on the performance of the access roads to East Hills Station.

Traffic

The operation of the Proposal is not anticipated to result in a direct increase in traffic generation. It is anticipated that as a result of the work, access to and from the station would be slightly shifted towards active forms of transport given the upgrade and increase in infrastructure surrounding the interchange, which would encourage safe and easy walking alternatives over vehicle transport modes.

Parking

Commuters arriving by car to East Hills Station are expected to increase by 27 per cent by the year 2036, resulting in an increase in parking demand at East Hills Station. The Proposal

would provide an increased number of accessible parking spaces at the station (providing two DDA spaces). The accessible pathway to the Park Road station entrance from the commuter car park would allow for improved access to the station.

The permanent net loss of one car space in the Park Road car park is required as part of the upgrade of the accessible parking spaces to provide a compliant shared zone.

Public transport and pedestrians

Bus and rail services

The Proposal does not include changes to existing bus/rail services on Park Road and Maclaurin Avenue and would not impact on the operation (service operation or timetabling) of public transport in the vicinity of East Hills Station. The Proposal is not anticipated to have any impacts on existing bus stops surrounding the station.

Pedestrians

The Proposal has been designed to maintain/improve pedestrian manoeuvrability throughout the station precinct. The Proposal would also allow for accessible movement within the interchange across all transport modes, in particular to and from the train station platform, external road network and accessible parking spaces.

Taxi and kiss and ride facilities

A formalised kiss and ride zone is proposed on Park Road adjacent to the station entrance. The proposed location of the kiss and ride zone and taxi zone, and its proximity to the station and other public transport would assist in addressing the existing informal drop offs, and cater for the projected 15 per cent increase in kiss and ride by 2036.

Cyclists

The Proposal is not anticipated to result in any adverse impacts to cyclists during operation.

The proposal would not result in any changes to the existing bike racks, however the existing bike hoops would be relocated within the station entry on Park Road.

6.1.3 Mitigation measures

The following general mitigation measures are recommended for implementation, to minimise impacts during the construction of the Proposal:

- a Traffic Management Plan (TMP) would be prepared as part of the CEMP prior to the commencement of construction, and implemented for the duration of the construction phase
- consultation with City of Canterbury-Bankstown Council would be undertaken during preparation of the TMP. The performance of all project traffic arrangements would be monitored during construction
- notifications would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work
- road occupancy licences for temporary road closures would be obtained from City of Canterbury-Bankstown Council, where required
- qualified traffic controllers would be used during construction work to ensure safe and efficient movement of vehicle and pedestrian traffic on the external road as well as in and out of the construction site

- construction workers would be required to park away from the station (i.e. not within the existing commuter car parks) or within the nominated construction compounds, and encouraged to car pool where practicable
- fencing and barriers would be installed between the construction site and outside the construction site to ensure safe and easy navigation of pedestrians and cyclists.

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

6.2 Urban design, landscape and visual amenity

This section provides a summary of the East Hills Station Proposed Upgrade Landscape Character and Visual Impact Assessment prepared by Envisage (2020).

The assessment included a site inspection and desktop analysis to identify the visual sensitivity of the existing area and magnitude of the Proposal to determine the landscape character and visual impacts the Proposal would impose on the surrounding publicly accessible areas.

The methodology used to carry out the assessment conforms to the *Guideline for Landscape Character and Visual Impact Assessment, Environmental Impact Assessment Practice Note EIA-N04* (TfNSW, 2020), in which two assessments were conducted:

- landscape character assessment
- visual impact assessment.

The method used to measure impact is based on the combination of sensitivity of the existing area or view to change, and magnitude of the Proposal on that area or view to produce a combined impact rating of negligible, low, moderate-low, moderate, moderate-high and high, as shown in Table 6-3.

Table 6-3 Visual impact grading matrix (Source: TfNSW, 2020)

		Magnitude			
		High	Moderate	Low	Negligible
Sensitivity	High	High	High-Moderate	Moderate	Negligible
	Moderate	High-Moderate	Moderate	Moderate-low	Negligible
	Low	Moderate	Moderate-low	Low	Negligible
	Negligible	Negligible	Negligible	Negligible	Negligible

6.2.1 Existing environment

East Hills Station is located near the intersection between Park Road and Maclaurin Avenue in East Hills. The railway corridor crosses the Georges River and the centre of East Hills. The station is situated across from the local East Hills commercial centre. The station consists of a central island platform and an eastern platform with a commuter car park adjacent to Park Road. Entry into the station is via Thompson Lane and Park Road. Pedestrian access at the lower level of the station connects the two entries while a public pathway connects the Thompson Lane entry to Maclaurin Avenue.

The land use of the Proposal area is predominantly zoned R2 Low Density Residential under the Bankstown LEP 2015 (refer Figure 4-1). Majority of residences are detached one and two storey dwellings. The main commercial strip on Maclaurin Avenue is comprised of buildings up

to two storeys high, with a maximum height of up to 14 metres, and is zoned B2 Local Centre under the Bankstown LEP 2015. There are no known heritage listed items within the vicinity of the Proposal. Private and public property are well vegetated in the surrounding area with numerous large public reserves with native vegetation, particularly along the Georges River.

Visual receivers and viewpoints

The nearest potentially sensitive viewpoints are from residences close to the station and public locations in nearby commercial areas. Views would also be available from some local roads and residences slightly further away. Five viewpoint (VP) locations have been identified within 150 metres of the Proposal area, these are shown in Figure 6-2 and described in Table 6-5.

Figure 6-2 Approximate viewshed and viewpoints identified for assessment (Envisage, 2020)

Table 6-4 Identified viewpoints

Viewpoint	Description
VP1 – East Hills shopping area (south of the Proposal area)	VP1 is most representative of the views from local businesses and patrons of these businesses. The existing view of the station is across a public car park. The view of the station is prominent due to its elevated position, refer to Figure 6-3.
VP2 – Park Road residencies (east of the Proposal area)	VP2 is most representative of the views from residences on the opposite side of Park Road as well as pedestrians on Park Road. The existing views from Park Road are dominated by the station as residences and pedestrians are in close proximity, approximately 50 to 100 metres, from the station. Refer to Figure 6-4.
VP3 – Commercial area, Corner Park Road and Maclaurin Avenue (south-west of the Proposal area)	VP3 is most representative of the views from road users and pedestrians as well as the local businesses and patrons of those businesses.

Viewpoint	Description
	The existing views of the station are 100 metres away from the commercial area and there are only a moderate number of potential viewers. The views are also obscured by existing trees, refer to Figure 6-5.
VP4 – Close resident, Maclaurin Avenue (east of the Proposal area)	VP4 is most representative of the views from the closest residents situated on the eastern side of the station. The VP was assessed from the nearest publicly accessible location representative of one of the closest residences located at the rear of a commercial property at 36 Maclaurin Avenue. The existing views from the rear balcony and yard of this property are prolonged, private views of the station. At only approximately 10 metres from the rear fence of the property boundary, the existing view is dominated by the station and the Cypress trees, refer to Figure 6-6.
VP5 – Neighbouring resident, Thompson Lane (east of the Proposal area)	VP5 is most representative of the views from the neighbouring resident at 3 Thompson Lane on the eastern side of the station. The private property is separated from the railway line by the vacant lot owned by Transport for NSW. The existing views are dominated by the station, despite some screening from a Peppercorn tree located within the vacant lot, as well as the Cypress trees, refer to Figure 6-7.

Figure 6-3 VP1 – Existing view

Figure 6-4 VP2 – Existing view

Figure 6-5 VP3 – Existing view

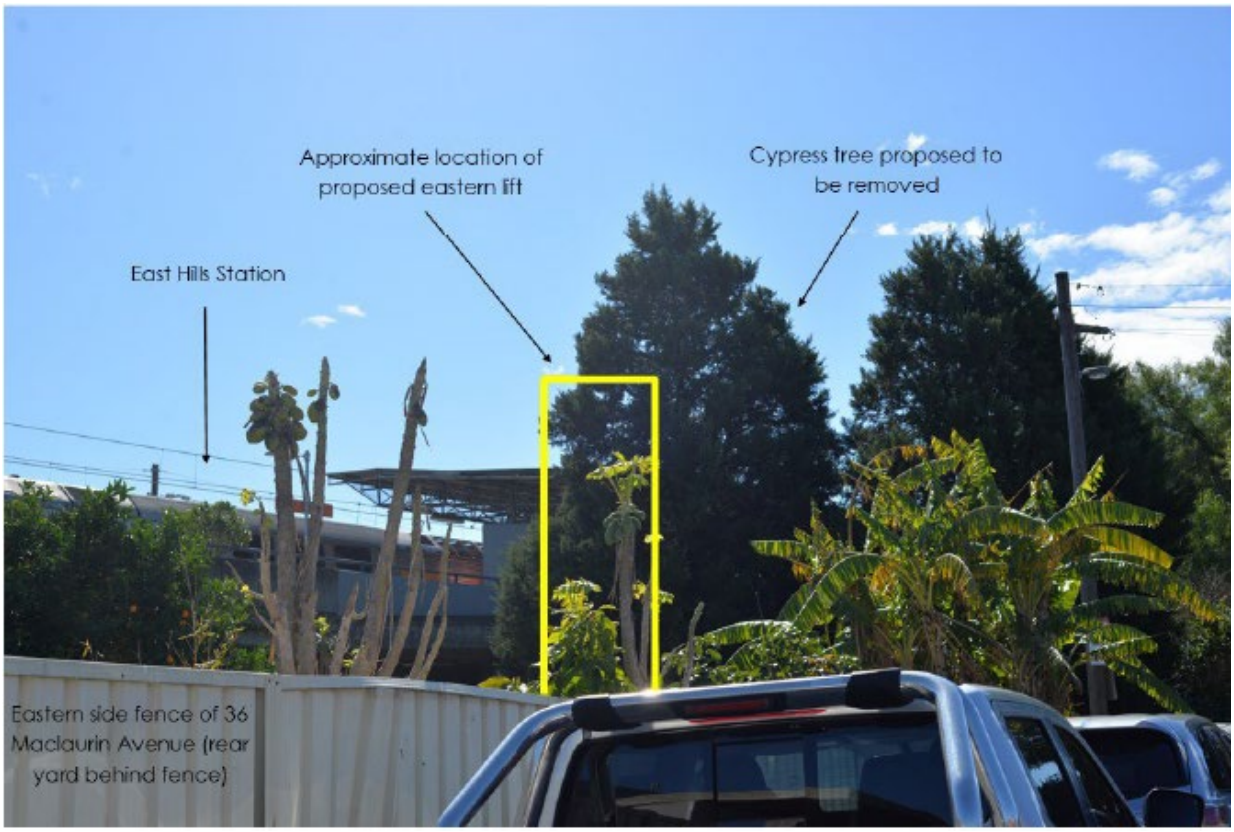


Figure 6-6 VP4 – Existing view

Figure 6-7 VP5 – Existing view

6.2.2 Potential impacts

a) Construction phase

Landscape character

The landscape character of the area would have low sensitivity to the proposed visual changes due to the typical nature of the urban landscape and the lack of notable natural or cultural heritage characteristics.

The construction phase of the Proposal would create a moderate magnitude of change to the landscape character. The construction activities that would impact the landscape character of the Proposal area include:

- a construction compound on the eastern side of the station
- a storage area within the existing car park on the western side of the station
- the construction aesthetic in general would contrast the surrounds
- the appearance of construction machinery
- removal of one 18-metre-high Cypress tree (*Cupressus torulosa*). Although an exotic species, the loss of any tree this size would be a loss of localised landscape character
- removal of two, three metre high trees from the western car park (refer Section 6.7).

During construction, the magnitude of change on the landscape character would be moderate. Combined with the low sensitivity to change, the overall landscape character impact during construction is assessed at moderate-low.

Visual impact

The impacts on the viewpoints in Figure 6-2 are assessed on the basis of sensitivity and magnitude of change using the impact grading matrix outlined in Table 6-3. The overall visual impacts anticipated during construction are either low or moderate as described in Table 6-5.

Table 6-5 Summary of visual impact during construction

Viewpoint	Sensitivity	Overall Impact
VP1 – East Hills shopping area (south of the Proposal area)	Sensitivity to views of the Proposal is considered **low**. The magnitude of change during the construction phase is also considered **low** as views of the construction activities would be approximately 80 to 100 metres away and partially obscured by existing structures and trees. Further, although night works may require lighting, the lights would be directed towards the station and construction would be temporary.	Low
VP2 – Park Road residences (east of the Proposal area)	Sensitivity to views of the Proposal is considered **moderate**. The magnitude of change during the construction phase is also considered **moderate** as residences would have clear views of the materials storage area in the western car park. Mobile equipment and movements would also be seen. Further, although nightwork may require lighting, the lights would be directed towards the station and construction would be temporary.	Moderate
VP3 – Commercial area, Corner Park	Sensitivity to views of the Proposal is considered **low**.	Low

Viewpoint	Sensitivity	Overall Impact
Road and Maclaurin Avenue (south-west of the Proposal area)	The magnitude of change during the construction phase is also rated as **low** as the main construction compound would not be visible, although the materials storage area and mobile equipment may be seen at various times. Additionally, although nightwork may require lighting, the lights would be directed towards the station and construction would be temporary.	
VP4 – Close resident, Maclaurin Avenue (east of the Proposal area)	Sensitivity to views of the Proposal is considered **moderate**. The magnitude of change during the construction phase is also rated as **moderate** as viewers would be exposed to prolonged close views of the construction site and activities which is expected to increase after the removal of the Cypress tree. Further, although nightwork may require lighting, the lights would be directed towards the station and construction would be temporary.	Moderate
VP5 – Neighbouring resident, Thompson Lane (east of the Proposal area)	Sensitivity to views of the Proposal is considered **moderate**. The magnitude of change during the construction phase is also considered **moderate** as views of the construction site and activity would be in close proximity and dominate if facing towards the station. However, construction would be temporary.	Moderate

b) Operational phase

Landscape character

The operational phase of the Proposal would have a low magnitude of change on the landscape character. The visual changes would only minimally impact the landscape character as:

- the new lifts would only be approximately two metres taller than the existing station roof structure
- the Proposal is compatible in scale and form with the existing station character
- changes would be confined to a relatively small proportion of the wider scene
- the removal of the Cypress tree would increase visibility to the station
- the removal of the three trees would be offset in accordance to the *Vegetation Offset Guide* (TfNSW, 2019b) with six new trees.

During operation, the magnitude of change on the landscape character would be low. Combined with the low sensitivity to change, the overall landscape character impact during construction is assessed at low.

Visual impact

During the operation of the proposal, the main elements that would be visible are the new lifts due to the removal of three (refer Section 6.7). Table 6-6 provides a summary of impacts on the assessed viewpoints during the operation of the Proposal. The photomontage prepared for VP1 is shown on Figure 6-8 and VP2 on Figure 6-9.

Table 6-6 Summary of visual impact during operation

Viewpoint	Sensitivity	Overall Impact
VP1 – East Hills shopping area (south of the Proposal area)	Sensitivity to views of the Proposal is considered **moderate.** The magnitude of change during the operational phase is considered low as although the removal of the Cypress tree would increase views of the station and the new lift, the proposed new lifts are compatible with the form and scale of the existing station. Additionally, the proposed access upgrades to the footpath would result in minimal visual change.	Low
VP2 – Park Road residences (east of the Proposal area)	Sensitivity to views of the Proposal is considered **moderate.** The magnitude of change during the operational phase is rated as low as views of Lift 1 would only be higher than the existing structure by approximately 2 metres and would be compatible in form and scale. From this VP, lift 2 is unlikely to be seen. Other upgrading works on the western side of the station would result in minimal visual change.	Moderate-low
VP3 – Commercial area, Corner Park Road and Maclaurin Avenue (south-west of the Proposal area)	Sensitivity to views of the Proposal is considered **low.** The magnitude of change during the operational phase is considered low as although the tops of the proposed lifts will be visible, the views would be obscured by existing trees. The lifts would also be compatible with the form and scale of the existing structure of the station despite being approximately 2 metres higher than the existing structure.	Low
VP4 – Close resident, Maclaurin Avenue (east of the Proposal area)	Sensitivity to views of the Proposal is considered **moderate.** The magnitude of change during the operational phase is rated as low as the station already dominates the view due to its close proximity. Although the removal of the Cypress tree will extend the views of the station, the proposed lifts are compatible with the form and scale of the existing structure.	Moderate-low
VP5 – Neighbouring resident, Thompson Lane (east of the Proposal area)	Sensitivity to views of the Proposal is considered **moderate.** within approximately 10 metres (about 3 metres closer than currently) from the property, the view would only be seen from the side windows of the residence. Further, although the trimming of the Peppercorn tree and removal of one Cypress tree would slightly increase the extent of view to the station, the remaining Cypress tree would still obscure and screen the majority of the view	Moderate-low

Figure 6-8 VP1 – Photomontage of Proposal during operation (Envisage, 2020)

Figure 6-9 VP2 – Photomontage of Proposal during operation (Envisage, 2020)

6.2.3 Mitigation measures

The following mitigation measures are proposed to manage the potential visual impacts of the Proposal:

- mitigation measures would be reviewed and revised where appropriate during detailed design development and construction planning to minimise the level of visual impact of the construction and operation phases of the Proposal
- the detailed design of the Proposal is to be undertaken with reference to the recommendations included in the Landscape and Visual Impact Assessment (Envisage, 2020), and include:
    - an Urban Design Plan (UDP) and Public Domain Plan (PDP) would be prepared by the Contractor, in consultation with City of Canterbury-Bankstown Council, and submitted to Transport for NSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design
    - unnecessary loss or damage to vegetation would be avoided by protecting trees prior to construction
    - 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*
    - any existing and future graffiti would be removed in accordance with Transport for NSW Standard Requirements
    - trees to be removed would be offset in accordance with Transport for NSW *Vegetation Offset Guide* (2019b). Offset planting would be prioritised in areas to manage visual impacts
    - reduce visual clutter by minimising new fencing and signage
    - ensure selected colours complement the station, particularly the lift shafts
    - further investigation of construction methods that may allow for the retention of the large Cypress tree on the eastern side of the station would be undertaken
- worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations
- temporary hoardings, barriers, traffic management and signage would be removed when no longer required.

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

6.3 Noise and vibration

This section provides a summary of the *Noise and Vibration Impact Assessment* (NVIA) undertaken by Cardno (2020).

The assessment included background ambient noise monitoring and noise modelling for various stages of construction work to predict the potential noise and vibration impacts of the Proposal on sensitive receivers surrounding East Hills Station.

6.3.1 Existing environment

Sensitive receivers

The existing station is surrounded by a range of sensitive receivers, predominantly residential and commercial premises. Non-residential receivers include recreational areas such as East Hills Park, Monash Reserve and Kelso Beach Reserve and educational facilities such as East Hills Girls' High School and Bright Futures Early Learning Centre.

Identified sensitive receiver types surrounding the Proposal were organised into noise catchment areas (NCA) based on a similar noise environments within these areas. These are listed in Table 6-7 and shown in Figure 6-10.

Table 6-7 Noise catchment areas and sensitive receivers surrounding the Proposal

NCA	Description	Land use/receiver type	Minimum Distance to Proposal (metres)
1	Residential properties to the northwest of the station on Park Road	Residential	20
2	Residential properties southeast of the station on Thompson Lane and Broe Avenue	Residential	5
3	Businesses along Maclaurin Avenue	Commercial	15
4	Monash Reserve	Passive Recreation	250
5	East Hills Park	Passive Recreation	165
6	Kelso Beach Reserve	Passive Recreation	440
7a	East Hills Girls High School Playing Fields	Active Recreation	460
7b	East Hills Girls High School - Classrooms	Educational	580
8	Bright Futures Early Learning Centre	Educational	325
9	East Hills Baptist Church	Place of Worship	130

Figure 6-10 Noise catchment areas and sensitive receivers

Background noise levels

Background noise levels were recorded at two locations near East Hills Station (refer Figure 6-10):

- Logger 1 – 3 Thompson Lane, East Hills located at the proposed site compound location
- Logger 2 – 92 Park Road about 30 metres from East Hills Station entrance.

Unattended noise monitoring was carried out for a continuous period between 9 September 2020 and 17 September 2020 to measure ambient and background noise levels around East Hills Station.

The Rating Background Level (RBL) for each site was determined in accordance with the *Noise Policy for Industry* (EPA, 2017). The results of the un-attended noise monitoring are detailed in Table 6-8.

Table 6-8 Rating background noise level

Logger	Measurement location	Measured Rating Background Level, dB(A)		
		07:00-18:00	18:00-22:00	22:00-07:00
1	3 Thompson Lane, East Hills	40	41	32
2	92 Park Road, East Hills	38	36	31

It should be noted that the background noise monitoring was conducted during COVID-19 and therefore may represent non-typical background noise levels. Background noise levels are likely to be quieter than the pre-COVID levels and therefore this assessment can be considered conservative.

6.3.2 Potential impacts

a) Construction phase

Noise

Noise management levels

Proposal specific Noise Management Levels (NML) were developed for the NCAs surrounding East Hills Station in accordance with the *Interim Construction Noise Guideline* (DECC 2009, ICNG). The applicable NML for residential receivers for standard and non-standard hours are shown in Table 6-9.

Table 6-9 Construction noise management levels – residential receivers (NCA 1 & 2)

NCA	Noise Management Level, dB(A)			*Sleep Disturbance $L_{A1, 1\ min}$
	Standard Hours (RBL + 10 dB(A))		Outside Standard Hours (RBL + 5 dB(A))	
	Day	Evening	Night	
1 and 2	49	44	37	60

A summary of the adopted NMLs for non-residential receivers is shown in Table 6-10.

Table 6-10 Construction noise management levels – non-residential receivers (NCA 3 to 7)

NCA	Non-Residential Sensitive Receiver	External Noise Management Level, dB(A))
3	Businesses along Maclaurin Avenue	70
4	Monash Reserve	60
5	East Hills Park	60
6	Kelso Beach Reserve	60
7a	East Hills Girls High School Playing Fields	55
7b	East Hills Girls High School - Classrooms	65
8	Bright Futures Early Learning Centre	50
9	East Hills Baptist Church	55

Predicated noise levels

Construction noise emissions were predicted by modelling the noise sources, receiver locations and construction activities across 10 construction stages which are outlined in Table 6-11.

Table 6-11 Construction stages and duration

Stage No.	Stage	Duration
1	Site establishment and enabling work	2-3 months
2a1	Lift 1 work	8 months
2a2	Lift 2 work - Thompson Lane	8 months
2b1	Platform work – services	1-3 months
2b2	Platform work worst case (services)	1-10 shifts
3	Station building work	3-5 months
4a	Station building work – ramps and stairs	8 months
4b	Park Road parking, kiss and ride and pedestrian work	2-4 months
4c	Maclaurin Avenue footpath work	1-3 months
4d	Site demobilisation	1-2 months

All timeframes are indicative and subject to change during detailed design.

Predicted construction noise levels at the worst case location in each modelled NCA for each stages are shown in Table 6-12 for standard hours and Table 6-13 for non-standard hours. The levels below represent the worst case predicted noise impact at the most affected receivers in each NCA. Noise levels as a result of construction activities are predicted to be lower than these levels for the remaining receivers within each associated NCA.

Noise levels have been coloured according to their expected level of subjective impact as defined in Table 9 of the CNVS V4 Addendum (Nov 2019).

Table 6-12 Predicted noise levels during standard working hours

Most Affected Receivers	NCA	Predicted Construction Noise Level[1] dB(A), $L_{Aeq\ 15hr}$	ICNG Noise Management Levels (NMLs), dB(A)			Predicted Worst Case Exceedance of ICNG NMLs		
			Std. Hours	OOHW1 Hours[2]	OOHW2 Hours[2]	Std. Hours	OOHW1 Hours	OOHW2 Hours
Noticeable (NML-5 to NML)								
Clearly audible (NML to NML+10)								
Moderately intrusive (NML+10 to NML +20)								
Highly intrusive / Highly noise affected (>NML+20 or >75 dB(A) for residential receivers)								
Stage 1 –Site Establishment & Enabling Work– Standard Working Hours								
92 Park Road	1	66	49	-	-	17	-	-
3 Thompson Lane	2	98	49	-	-	49	-	-
Commercial	3	84	70	-	-	14	-	-
Monash Reserve	4	51	60	-	-	4	-	-
East Hills Park	5	53	60	-	-	-	-	-
Kelso Beach Reserve	6	44	60	-	-	-	-	-
East Hills Girls High School	7a	51	55	-	-	-	-	-
East Hills Girls High School Playing Fields	7b	52	65	-	-	-	-	-
Bright Futures Early Learning Centre	8	53	50	-	-	3	-	-
East Hills Baptist Church	9	64	55	-	-	9	-	-
Stage 2a1 – Lift 1 - Work– Standard Working Hours								
92 Park Road	1	83	49	-	-	34	-	-

Most Affected Receivers	NCA	Predicted Construction Noise Level[1] dB(A), $L_{Aeq\ 15hr}$	ICNG Noise Management Levels (NMLs), dB(A)			Predicted Worst Case Exceedance of ICNG NMLs		
			Std. Hours	OOHW1 Hours[2]	OOHW2 Hours[2]	Std. Hours	OOHW1 Hours	OOHW2 Hours
3 Thompson Lane	2	60	49	-	-	11	-	-
Commercial	3	58	70	-	-	-	-	-
Monash Reserve	4	42	60	-	-	-	-	-
East Hills Park	5	45	60	-	-	-	-	-
Kelso Beach Reserve	6	54	60	-	-	-	-	-
East Hills Girls High School	7a	39	55	-	-	-	-	-
East Hills Girls High School Playing Fields	7b	45	65	-	-	-	-	-
Bright Futures Early Learning Centre	8	42	50	-	-	-	-	-
East Hills Baptist Church	9	50	55	-	-	-	-	-
Stage 2a2 – Lift 2 – Work – Thompson Lane– Standard Working Hours								
92 Park Road	1	54	49	-	-	5	-	-
3 Thompson Lane	2	94	49	-	-	45	-	-
Commercial	3	88	70	-	-	18	-	-
Monash Reserve	4	52	60	-	-	-	-	-
East Hills Park	5	53	60	-	-	-	-	-
Kelso Beach Reserve	6	36	60	-	-	-	-	-
East Hills Girls High School	7a	49	55	-	-	6	-	-
East Hills Girls High School Playing Fields	7b	51	65	-	-	-	-	-

Most Affected Receivers	NCA	Predicted Construction Noise Level[1] dB(A), $L_{Aeq\ 15hr}$	ICNG Noise Management Levels (NMLs), dB(A)			Predicted Worst Case Exceedance of ICNG NMLs		
			Std. Hours	OOHW1 Hours[2]	OOHW2 Hours[2]	Std. Hours	OOHW1 Hours	OOHW2 Hours
Bright Futures Early Learning Centre	8	49	50	-	-	-	-	-
East Hills Baptist Church	9	56	55	-	-	1	-	-
Stage 2b1 – Platform Works - Services–Standard Hours								
92 Park Road	1	65	49	-	-	16	-	-
3 Thompson Lane	2	62	49	-	-	13	-	-
Commercial	3	62	70	-	-	-	-	-
Monash Reserve	4	49	60	-	-	-	-	-
East Hills Park	5	50	60	-	-	-	-	-
Kelso Beach Reserve	6	42	60	-	-	-	-	-
East Hills Girls High School	7a	42	55	-	-	-	-	-
East Hills Girls High School Playing Fields	7b	44	65	-	-	-	-	-
Bright Futures Early Learning Centre	8	47	50	-	-	-	-	-
East Hills Baptist Church	9	47	55	-	-	-	-	-
Stage 2b2 – Platform Works Worst Case - Services–Standard Hours								
92 Park Road	1	72	49	-	-	23	-	-
3 Thompson Lane	2	84	49	-	-	35	-	-
Commercial	3	79	70	-	-	9	-	-
Monash Reserve	4	62	60	-	-	2	-	-

Most Affected Receivers	NCA	Predicted Construction Noise Level[1] dB(A), $L_{Aeq\ 15hr}$	ICNG Noise Management Levels (NMLs), dB(A)			Predicted Worst Case Exceedance of ICNG NMLs		
			Std. Hours	OOHW1 Hours[2]	OOHW2 Hours[2]	Std. Hours	OOHW1 Hours	OOHW2 Hours
East Hills Park	5	63	60	-	-	3	-	-
Kelso Beach Reserve	6	54	60	-	-	-	-	-
East Hills Girls High School	7a	54	55	-	-	-	-	-
East Hills Girls High School Playing Fields	7b	56	65	-	-	-	-	-
Bright Futures Early Learning Centre	8	59	50	-	-	9	-	-
East Hills Baptist Church	9	59	55	-	-	4	-	-
Stage 3 – Station Building Works-–Standard Hours								
92 Park Road	1	82	49	-	-	33	-	-
3 Thompson Lane	2	56	49	-	-	7	-	-
Commercial	3	54	70	-	-	-	-	-
Monash Reserve	4	39	60	-	-	-	-	-
East Hills Park	5	40	60	-	-	-	-	-
Kelso Beach Reserve	6	54	60	-	-	-	-	-
East Hills Girls High School	7a	34	55	-	-	-	-	-
East Hills Girls High School Playing Fields	7b	40	65	-	-	-	-	-
Bright Futures Early Learning Centre	8	59	50	-	-	9	-	-
East Hills Baptist Church	9	59	55	-	-	4	-	-
Stage 4a – Station Building Works - Ramps & Stairs-–Standard Hours								

Most Affected Receivers	NCA	Predicted Construction Noise Level[1] dB(A), $L_{Aeq\ 15hr}$	ICNG Noise Management Levels (NMLs), dB(A)			Predicted Worst Case Exceedance of ICNG NMLs		
			Std. Hours	OOHW1 Hours[2]	OOHW2 Hours[2]	Std. Hours	OOHW1 Hours	OOHW2 Hours
92 Park Road	1	86	49	-	-	37	-	-
3 Thompson Lane	2	84	49	-	-	35	-	-
Commercial	3	84	70	-	-	14	-	-
Monash Reserve	4	51	60	-	-	-	-	-
East Hills Park	5	52	60	-	-	-	-	-
Kelso Beach Reserve	6	57	60	-	-	-	-	-
East Hills Girls High School	7a	49	55	-	-	-	-	-
East Hills Girls High School Playing Fields	7b	51	65	-	-	-	-	-
Bright Futures Early Learning Centre	8	44	50	-	-	-	-	-
East Hills Baptist Church	9	54	55	-	-	-	-	-
Stage 4b – Park Road parking, kiss and ride and pedestrian work-–Standard Hours								
92 Park Road	1	90	49	-	-	41	-	-
3 Thompson Lane	2	62	49	-	-	13	-	-
Commercial	3	59	70	-	-	-	-	-
Monash Reserve	4	47	60	-	-	-	-	-
East Hills Park	5	48	60	-	-	-	-	-
Kelso Beach Reserve	6	59	60	-	-	-	-	-
East Hills Girls High School	7a	45	55	-	-	-	-	-

Most Affected Receivers	NCA	Predicted Construction Noise Level[1] dB(A), $L_{Aeq\ 15hr}$	ICNG Noise Management Levels (NMLs), dB(A)			Predicted Worst Case Exceedance of ICNG NMLs		
			Std. Hours	OOHW1 Hours[2]	OOHW2 Hours[2]	Std. Hours	OOHW1 Hours	OOHW2 Hours
East Hills Girls High School Playing Fields	7b	53	65	-	-	-	-	-
Bright Futures Early Learning Centre	8	46	50	-	-	-	-	-
East Hills Baptist Church	9	54	55	-	-	-	-	-
Stage 4c – Maclaurin footpath works-–Standard Hours								
92 Park Road	1	56	49	-	-	7	-	-
3 Thompson Lane	2	88	49	-	-	39	-	-
Commercial	3	93	70	-	-	23	-	-
Monash Reserve	4	55	60	-	-	-	-	-
East Hills Park	5	52	60	-	-	-	-	-
Kelso Beach Reserve	6	39	60	-	-	-	-	-
East Hills Girls High School	7a	52	55	-	-	-	-	-
East Hills Girls High School Playing Fields	7b	51	65	-	-	-	-	-
Bright Futures Early Learning Centre	8	53	50	-	-	3	-	-
East Hills Baptist Church	9	56	55	-	-	1	-	-
Stage 4d – Site demobilization-–Standard Hours								
92 Park Road	1	79	49	-	-	30	-	-
3 Thompson Lane	2	84	49	-	-	35	-	-
Commercial	3	92	70	-	-	22	-	-

Most Affected Receivers	NCA	Predicted Construction Noise Level[1] dB(A), $L_{Aeq\ 15hr}$	ICNG Noise Management Levels (NMLs), dB(A)			Predicted Worst Case Exceedance of ICNG NMLs		
			Std. Hours	OOHW1 Hours[2]	OOHW2 Hours[2]	Std. Hours	OOHW1 Hours	OOHW2 Hours
Monash Reserve	4	52	60	-	-	-	-	-
East Hills Park	5	50	60	-	-	-	-	-
Kelso Beach Reserve	6	47	60	-	-	-	-	-
East Hills Girls High School	7a	49	55	-	-	-	-	-
East Hills Girls High School Playing Fields	7b	48	65	-	-	-	-	-
Bright Futures Early Learning Centre	8	50	50	-	-	-	-	-
East Hills Baptist Church	9	51	55	-	-	-	-	-

[1] *The modelling represents the worst case scenario, where all plant is operating simultaneously. However, in practice, all activities / plant within each stage are very unlikely to operate at the same time. The modelling results should therefore be considered conservative.*

[2] *Work outside of standard construction hours is defined as Out-of-Hours Work (OOHW) and can be divided into 2 periods of sensitivity. OOHW Period 1 is defined as Monday to Saturday 6:00pm to 10:00pm (evenings), Saturday 7:00am to 8:00am and 1:00pm to 10:00pm (day & evening) and Sunday and public holidays 8:00am to 6:00pm (days). OOHW Period 2 is defined as Monday to Saturday 10:00pm to 7:00am (nights) and Sundays and public holidays 6:00pm to 8:00am (nights).*

Table 6-13 Predicted noise levels during non-standard working hours

Most Affected Receivers	NCA	Predicted Construction Noise Level[1] dB(A), LAeq 15hr	ICNG Noise Management Levels (NMLs), dB(A)			Predicted Worst Case Exceedance of ICNG NMLs		
			Std. Hours	OOHW1 Hours[2]	OOHW2 Hours[2]	Std. Hours	OOHW1 Hours	OOHW2 Hours
Noticeable (NML-5 to NML+5)								
Clearly audible (NML+5 to NML+15)								
Moderately intrusive (NML+15 dB(A) to NML +25 dB(A))								
Highly intrusive / Highly noise affected (>NML+25 dB(A))								
Stage 2a1 – Lift 1 – Work – OOHW1 & 2 Working Hours								
92 Park Road	1	83	-	44	37	-	39	46
3 Thompson Lane	2	60	-	44	37	-	16	23
Stage 2a2 – Lift 2 – Work – Thompson Lane – OOHW1 & 2 Working Hours								
92 Park Road	1	54	-	44	37	-	10	17
3 Thompson Lane	2	94	-	44	37	-	50	57
Stage 2b1 – Platform Works - Services – OOHW1 & 2 Working Hours								
92 Park Road	1	65	-	44	37	-	21	28
3 Thompson Lane	2	62	-	44	37	-	18	25
Stage 2b2 – Platform Works Worst Case – OOHW1 & 2 Working Hours								
92 Park Road	1	72	-	44	37	-	28	35
3 Thompson Lane	2	84	-	44	37	-	40	47
Stage 3 – Station Building Works-– OOHW1 & 2 Working Hours								

Most Affected Receivers	NCA	Predicted Construction Noise Level[1] dB(A), LAeq 15hr	ICNG Noise Management Levels (NMLs), dB(A)			Predicted Worst Case Exceedance of ICNG NMLs		
			Std. Hours	OOHW1 Hours[2]	OOHW2 Hours[2]	Std. Hours	OOHW1 Hours	OOHW2 Hours
92 Park Road	1	82	-	44	37	-	38	45
3 Thompson Lane	2	56	-	44	37	-	12	19
Stage 4a – Station Building Works - OOHW1 and 2 Working Hours								
92 Park Road	1	86	-	44	37	-	42	49
3 Thompson Lane	2	84	-	44	37	-	40	47
Stage 4b – Park Road parking, kiss and ride and pedestrian work-– OOHW1 and 2 Working Hours								
92 Park Road	1	90	-	44	37	-	36	43
3 Thompson Lane	2	62	-	44	37	-	18	25

[1] *The modelling represents the worst case scenario, where all plant is operating simultaneously. However, in practice, all activities / plant within each stage are very unlikely to operate at the same time. The modelling results should therefore be considered conservative.*

[2] *Work outside of standard construction hours is defined as Out-of-Hours Work (OOHW) and can be divided into 2 periods of sensitivity. OOHW Period 1 is defined as Monday to Saturday 6:00pm to 10:00pm (evenings), Saturday 7:00am to 8:00am and 1:00pm to 10:00pm (day & evening) and Sunday and public holidays 8:00am to 6:00pm (days). OOHW Period 2 is defined as Monday to Saturday 10:00pm to 7:00am (nights) and Sundays and public holidays 6:00pm to 8:00am (nights).*

A summary of the predicted noise impacts for each construction stage are described in Table 6-14. It should be noted that this assessment has endeavoured to carry out “worst case” noise modelling, and noise levels are predicted based on all sources operating simultaneously within the worksite.

However in practice, all activities/plant within each stage are very unlikely to operate at the same time.

For example, for Stage 1, the noise predictions have been based on eight different types of plant and equipment (refer to table 6.3 of the *Noise and Vibration Impact Assessment*) being used concurrently, which has led to a noise prediction of 98dB for the nearest receiver in Thompson Lane. However, given that the size of the proposed construction compound is 140 square metres, it is unlikely that all machinery types could operate simultaneously.

The 98dB noise prediction is largely influenced by the operation of a mulcher during vegetation clearance work. The model assumes the maximum noise level of the mulcher would occur continuously (i.e. when tree branches are being fed into the machine). In practice, branches would be fed intermittently into the mulcher and the equipment would be idling at a substantially lower noise level. Additionally the mulcher is only expected to be used for up to one day in total during the construction period, as there are only three trees to be removed. The noise from the removal of one tree would occur for up two hours at NCA 2 and the removal of two trees for up to four hours at NCA 1.

Similarly, the activities undertaken within each stage (e.g. installation of site sheds, vegetation removal, connection of water and electrical services) would occur sequentially, not concurrently.

Therefore, while the predicted noise levels identified in Table 6-12 and Table 6-13 show exceedances to the applicable NMLs, these represents the worst case scenarios and in practice noise experienced by nearby receivers is likely to be substantially lower than the noise model predictions

Table 6-14 Summary of predicted noise impacts

Stage No.	Work Stage	Summary of predictions
1	Site establishment and enabling work	• Moderately and highly intrusive noise levels during the day at nearby residences and commercial premises, and exceedances of the NMLs for the day period for NCAs 1 to 3 to varying extents. Properties located on Thompson Lane, closest to the worksites, would experience the highest exceedances when the works are closest to them for short periods of time. Exceedances of the daytime NMLs, and clearly audible noise levels are also predicted for the childcare centre and church in NCAs 8 and 9 respectively. • OOHW works are not proposed for this stage.
2a1	Lift construction (Park Road)	• Moderately and highly intrusive noise levels during the day at nearby residences, with no predicted exceedances of the NMLs for the day period for other assessed NCAs. Properties located on Park Road, closest to the worksites, would experience the highest exceedances. • Moderately and highly intrusive noise levels are also predicted during the evening and night period, with higher levels expected to the north of the rail corridor.

Stage No.	Work Stage	Summary of predictions
2a2	Lift construction (Thompson Lane)	• Clearly audible noise level to the north of the corridor and highly intrusive noise levels to the south during the day at nearby residences and commercial premises, with no predicted exceedances of the NMLs for the day period for other assessed NCAs. Properties located on Thompson Lane, closest to the worksites, would experience the highest exceedances. • Moderately and very highly intrusive noise levels (Thompson Lane) are also predicted during the evening and night period, with higher levels expected to the south of the rail corridor.
2b1	Platform work (services)	• Moderately intrusive noise levels during the day at nearby residences, with no predicted exceedances of the NMLs for the day period for other assessed NCAs. Properties located on Park Road, closest to the worksites, would experience the highest exceedances. • Moderately (OOHW1 period) and very highly intrusive (OOHW2 period) noise levels are also predicted during the evening and night period, with similar levels expected on both sides of the rail corridor.
2b2	Platform work worst case (services)	• Highly intrusive noise levels during the day at nearby residences, with predicted exceedances of the ICNG noise management levels for the day period for NCAs 3, 5 and 6. Properties located on Thompson Lane, closest to the worksites, would experience the highest exceedances. • Very highly intrusive noise levels are also predicted during both the evening and night period, with the highest levels expected on the southern side of the rail corridor of the rail corridor.
3	Station building work	• Highly intrusive noise levels during the day at nearby residences, to the north of the station and clearly audible noise levels to the south, with no predicted exceedances of the NMLs for the remainder of the NCAs during the day. • Very highly intrusive noise levels are predicted during both the evening and night period in NCA 2, with the highest levels expected on the northern side of the rail corridor.
4a	Station building works (ramps and stairs)	• Highly intrusive noise levels during the day at nearby residences, to the north and south of the station in NCA1 and 2, with moderately intrusive exceedances of the NMLs predicted at commercial premises in NCA3, and no exceedances for the remainder of the NCAs during the day. • Very highly intrusive noise levels are predicted during both the evening and night period for NCA1 and 2, with the highest levels expected on the northern side of the rail corridor.

Stage No.	Work Stage	Summary of predictions
4b	Park Road parking, kiss and ride and pedestrian work	• Highly intrusive noise levels during the day at nearby residences, to the north and south of the station in NCA1 and 2, with moderately intrusive exceedances of the NMLs predicted at commercial premises in NCA3, and no exceedances for the remainder of the NCAs during the day. • Highly intrusive noise levels are predicted during both the evening and night period for NCA1, and clearly audible levels predicted for NCA2. The highest levels are expected on the northern side of the rail corridor.
4c	Maclaurin Avenue footpath	• Clearly audible noise levels at NCA 1 and highly intrusive noise levels at NCA 2 and 3 during the day at nearby residences, and commercial premises and exceedances of the NMLs for the day period for NCAs 1 to 3 to varying extents. Properties located on Thompson Lane, closest to the worksites would experience the highest exceedances. Exceedances are not predicted for the other NCAs for this stage. • OOHW works are not proposed for this stage.
4d	Site demobilisation	• Highly intrusive noise levels during the day at nearby residences, and commercial premises and exceedances of the NMLs for the day period for NCAs 1 to 3 to varying extents. Properties located on Thompson Lane, and the commercial premises in NCA 3 closest to the worksites, will experience the highest exceedances. • OOHW works are not proposed for this stage.

Sleep disturbance

As the construction of the Proposal would require night work, a sleep disturbance assessment was undertaken. The noise and vibration modelling indicates that maximum construction noise levels at NCA 1 and 2 are likely to exceed the sleep disturbance criteria for all “outside of standard hours” construction stages, when construction works are located closest to East Hills Station along Park Road and Thompson Lane.

Work is expected to take up to 18 months to complete, however these exceedances would not occur continuously over the duration of construction. Out of hours work generally should only take place during rail shutdowns (occurring over a 48 hour period on a weekend), however occasionally would be undertaken outside of rail shutdowns.

Vibration

Certain construction activities would require the use of vibration intensive equipment that may affect the nearest sensitive receivers. The following plant and equipment has been identified as having the potential to generate the most vibration:

- vibratory rollers
- pile driver and boring
- hydraulic hammers
- jackhammers.

Construction vibration levels vary depending on the distance from the equipment in use, the energy level imparted to the ground by the construction process, and the bedrock type. The greatest vibration generating sources associated with the construction work will be rock

hammers and piling rigs as shown in Table 6-15. It is anticipated that no blasting would be required as part of this proposal.

The Transport for NSW *Construction Noise and Vibration Strategy* (TfNSW, 2019a, CNVS) details the minimum working distance for vibration intensive plant from sensitive receivers. Table 6-15 presents the indicative minimum working distances for the nominated construction plant to minimise the risk of structural damage and human comfort for sensitive receivers, based on the data provided in the CNVS.

Table 6-15 Recommended minimum working distances for vibration intensive plant from sensitive receivers (CNVG)

Plant Item	Rating / description	Minimum working distance	
		Cosmetic Damage (BS 7385)	Human Response (OEH Vibration Guideline)
Vibratory roller	1-2 tonne	5 m	15 m to 20 m
	2-4 tonne	6 m	20 m
	4-6 tonne	12 m	40 m
	7-13 tonne	15 m	100 m
	13-18 tonne	20 m	100 m
	> 18 tonne	25 m	100 m
Small hydraulic hammer	(300 kg – 5t to 12t excavator)	2 m	7 m
Medium hydraulic hammer	(900 kg – 12t to 18t excavator)	7 m	23 m
Large hydraulic hammer	(1600 kg – 18t to 34t excavator)	22 m	73 m
Pile Driver - Vibratory	Sheet Piles	2 m to 20 m	20
Piling Rig - Bored	≤ 800 mm	2 m (nominal)	N/A
Piling Rig – Hammer	12 t down force	15 m	50
Jackhammer	Hand Held	1 m (nominal)	Avoid contact with structure

Thompson Lane residences are located in close proximity (about 15 metres) to the south of the proposed piling work. Rock hammering is proposed approximately 45 metres from Park Road residences. Both of these items are likely to be outside of the safe working limits recommended above for standard buildings, and predicted vibration levels greater than 2.5 mm/s are not expected at any of the closest residences. However, work is proposed within safe working distances for existing station infrastructure and services and therefore, should be reviewed in more detail during detailed design.

b) Operational phase

The operation of East Hills Station would remain unchanged as a result of the Proposal. There would be no expected changes to operational rail and as such, this has not been assessed.

The operational equipment of the lifts (e.g. lift motor, air conditioning) is expected to generate increased noise during the operation of the Proposal. It is predicted that noise levels from the lift operations would be low, therefore operational noise impacts at neighbouring receivers are predicted to comply with operational noise criteria.

While specific mechanical plant details are yet to be finalised, it is expected that mechanical noise and vibration emissions would not have a significant impact on the surrounding environment,

If required, operational noise and vibration emissions would be addressed during the detailed design phase in order to comply with operational noise criteria.

6.3.3 Mitigation measures

The following mitigation measures are proposed to manage the potential noise and vibration impacts of the Proposal:

- a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (DECC, 2009), *Construction Noise and Vibration Strategy* (TfNSW, 2019a) and the Noise and Vibration Impact Assessment for the Proposal (Cardno, 2020). The CNVMP would include plant controls, behavioural management, management of construction hours (including out of hours works), notifications and provision of noise and vibration monitoring program where construction noise is predicted to exceed the NMLs
- use of temporary noise barriers where feasible. The height and location of these barriers would be determined during preparation of the CNVMP and would take into consideration the location of residential receivers along Thompson Lane and Park Road to ensure that 'line of sight' is broken, where feasible
- use of acoustic curtains (generally loaded vinyl based products), attached to wire construction fencing or laid over steel scaffold, will be investigated for stationary plant within the worksites during preparation of the CNVMP
- provide respite periods where noise levels are highly intrusive. Noise with special audible characteristics and vibration generating activities (including jack hammering, pile driving and vibratory rolling) may only be carried out in continuous blocks, not exceeding 3 hours each, with a minimum respite period of one hour between each block
- provision of temporary noise barriers along the rear of the Thompson Lane construction compound with no gaps and around specific activities will be investigated further as part of the CNVMP
- provision of scaffolding and mobile noise curtains/blankets immediately around higher noise generating plant will be investigated further as part of the CNVMP
- carry out Stage 2b "Platform works – services (worst case)" during standard hours only, where possible
- take into consideration measures for reducing the source noise levels of construction equipment by construction planning (limited hours/duration) and equipment selection where practicable

- conduct short term background noise monitoring prior to construction to confirm the ambient noise levels, if ambient conditions (the level of background activity) are considered to have changed as a result of changes to COVID 19 response
- where buildings are located within the safe working distance zone, dilapidation surveys should be carried out prior to construction
- where receivers are located within the safe work distance zones, vibration monitoring should be carried out to ensure compliance with the required criteria. If exceedances are recorded, work should be modified accordingly to reduce vibration levels.

The NVIA (Cardno, 2020) provides details of additional mitigation measures, in accordance with the matrix contained in the Transport for NSW's *Construction Noise and Vibration Strategy* (TfNSW, 2019a), which are recommended where exceedances of the NMLs are still likely to occur after application of the standard mitigation measures. Mitigation measures recommended include project notification, verification monitoring, specific notifications, respite periods, project specific respite offers, alternative accommodation and duration reductions. These measures would be addressed in the CNVMP and, where relevant, incorporated into applications for OOHW.

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

6.4 Indigenous heritage

6.4.1 Existing environment

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken on the 17 September 2020, covering a 200 metre and a one kilometre radius around East Hills Station. No Aboriginal heritage items or sites were recorded in the 200 metres search area, however four sites were identified in the one kilometre search area.

Certain landscape features can often indicate the likely presence of Indigenous objects, such as nearby waterways, sand dune systems, ridge tops, ridge lines, headlands, cliff faces and rock caves/shelters. The extensive landscape modification and the substantial disturbance that has occurred across the Proposal area, particularly during the development of East Hills Station, suggests that the presence of culturally sensitive buried items and evidence of Indigenous land use is unlikely to occur within the boundaries of the Proposal area.

6.4.2 Potential impacts

a) Construction phase

Construction of the Proposal would involve some minor excavation and other ground disturbing activities that have the potential to impact Indigenous sites, if present.

As no known Indigenous heritage items are located within the Proposal area and no high risk landscape features are located in 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 risk to Indigenous heritage from the operation of the Proposal.

6.4.3 Mitigation measures

The following mitigation measures are proposed to manage potential Indigenous heritage impacts:

- All construction staff would undergo an induction in the recognition of Indigenous cultural heritage material
- If unexpected Indigenous heritage objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW 2019c) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Heritage NSW and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and Heritage NSW notified.

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

6.5 Non-Indigenous heritage

6.5.1 Existing environment

A desktop search of the following historic heritage registers was undertaken for the Proposal site and surrounds on 8 October 2020:

- Australian Heritage Database, including:
  - National Heritage List
  - Commonwealth Heritage List
  - Register of the National Estate (non-statutory archive)
- NSW State Heritage Inventory including State Heritage Register (SHR), Section 170 Heritage and Conservation registers
- Bankstown LEP 2015.

The desktop search identified no heritage items listed on the Commonwealth, National or State Heritage Inventory within the Proposal area or immediate surrounds.

The closest heritage listed items within 6.6 kilometres of the Proposal and are listed in Table 6-16.

Table 6-16 Heritage listed items in the vicinity of the Proposal

Heritage Results	Status	Distance from the Proposal
Bankstown Airport, Airport Avenue	Register of the National Estate (Non-statutory archive)	Approximately 4.9 km north
Bankstown Airport Air Traffic Control Tower Tower Road	Commonwealth Heritage List	Approximately 4 km north

Heritage Results	Status	Distance from the Proposal
Bankstown Urban Conservation Area	Register of the National Estate (Non-statutory archive)	Approximately 6 km north east
Vietnamese Boat People Monument Rickard Road	National Heritage List	Approximately 6.6 km north east

The NSW State Heritage Register identified one heritage item, East Hills (Georges River) Underbridge (SHI#4801836) along Henry Lawson Drive, south east of the Proposal.

The East Hills (Georges River) Underbridge is owned by TAHE and is of local significance, as part of the original infrastructure for the completion of the East Hills to Glenfield Line, and is the first and only continuous prestressed concrete railway viaduct in New South Wales built by the incrementally launched method of construction.

The Bankstown LEP 2015 identified one general heritage item located about one kilometre east of the Proposal and one archaeological item 200 metres south west of the proposal.

6.5.2 Potential impacts

a) Construction phase

The Proposal would be confined to the Proposal area. As no heritage items are located within the Proposal area or in close proximity, the Proposal would not result in any direct or indirect impacts on any heritage items.

b) Operational phase

There would be no risks to non-Indigenous or archaeological heritage from the operation of the Proposal.

6.5.3 Mitigation measures

The following mitigation measures are proposed to manage potential non-Indigenous heritage impacts:

- A heritage induction would be provided to workers prior to construction, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction
- In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in Transport for NSW's *Unexpected* Heritage *Finds Guideline* (TfNSW 2019c) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and DPIE.

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

6.6 Socio-economic impacts

6.6.1 Existing environment

The Proposal area is located within the Canterbury-Bankstown LGA and contains a mixture of land uses within an area of about 110 square kilometres. Land uses include residential, parkland and commercial zones. South-east of the Proposal area along Maclaurin Avenue are commercial and small scale retail businesses.

The residential receivers to the east and west of the Proposal area generally comprise of one and two storey dwellings on tree lined streets along Park Road and Broe Avenue. The nearest residential receivers are directly adjacent to the eastern side of the Proposal area along Thompson Lane. Other community, religious and educational facilities located within the broader area include:

- East Hills Baptist Church (230 metres north-east of the Proposal)
- East Hills Child Care Centre (290 metres south-west of the Proposal)
- East Hills Girls High School (700 metres north-east of the Proposal)
- East Hills Boys Technology High School (850 metres north-east of the Proposal)
- East Hills Public School (650 metres north-east of the Proposal)
- Bright Futures Early Learning Centre (400 metres east of the Proposal).

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

- commuters including train passengers using East Hills Station
- residential and non-residential receivers along Park Road, Thompson Lane and Broe Avenue.

A review of the 2016 Australian Bureau of Statistics (ABS) Census data was undertaken for East Hills. The area of East Hills has a population of about 77,000 with a median age of 38 years old. It was identified that about 60 per cent were employed full-time and 23 per cent were employed part-time. Thirteen per cent of workers travelled to work via train representing the second most common mode of transport to work for the East Hills area.

The existing infrastructure at East Hills Station does not meet DSAPT or DDA standards, providing accessibility issues for rail customers due to non-compliant public domain footpaths, and non-complaint access to the platforms. The station also does not currently provide a family accessible toilet or ambulant toilets.

The *Canterbury-Bankstown Community Strategic Plan 2028* (City of Canterbury-Bankstown, undated) (refer Table 2-1) aims to address key concerns of the community, including a desire to be 'moving and integrated' (an accessible city with great local destinations and many options to get there) and to be 'healthy and active' (a motivated city that nurtures healthy minds and bodies). The current infrastructure at East Hills Station does not provide accessible transport for all people.

6.6.2 Potential impacts

a) Construction phase

During construction, the Proposal would temporarily impact on customers, pedestrians, residents, motorists, businesses and other surrounding receivers due to:

- temporary changes to vehicular, bike and pedestrian access to, through and around the station

- temporary loss of parking on Park Road due to the proposed materials storage and laydown areas
- temporary disruptions to station facilities and amenities (e.g. seating, toilets, pay telephone)
- temporary impacts to local traffic movements due to an increase in truck movements in the area, delivering site materials, plant and equipment
- construction noise, dust and visual impacts.

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

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

The local amenity of the Proposal area may be impacted to a greater extent by increased noise, traffic, dust and vibration from construction activities if appropriate mitigation measures are not implemented. Refer to sections 6.1, 6.2 and 6.3 for discussion on the potential traffic, access, visual and noise impacts arising from construction of the Proposal and the proposed mitigation measures.

b) Operational phase

Overall, the Proposal would provide positive socio-economic benefits to East Hills and the Canterbury-Bankstown LGA, including:

- improved accessibility for customers at East Hills Station providing an accessible path to the station platforms through the provision of upgraded footpaths and new lifts, and DDA compliant disabled parking spaces to current standards
- improved transport interchange facilities including new formalised kiss and ride space
- improved customer amenity and facilities at the station including a new family accessible toilet, new tactiles and wayfinding signage
- potential increased use of public transport to and from East Hills
- additional lighting and CCTV to improve CPTED outcomes for the area.

6.6.3 Mitigation measures

The following mitigation measures are proposed to manage potential socio-economic impacts:

- mitigation measures in respect to potential impacts to amenity (e.g. noise, dust and visual) as assessed in the relevant sections of this report and listed in Section 7.2 of this report
- 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
- feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable
- a Community Liaison Management 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

- 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
- the community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Management Plan to be developed prior to construction.

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

6.7 Biodiversity

An *Arboricultural Impact Assessment* (Tree Survey Arboricultural Consultants, 2020) was undertaken for the Proposal. This included a site inspection by a qualified arborist on 18 August 2020. In addition a review of relevant databases and other ecological resources was undertaken including:

- NSW Biodiversity Conservation Division Atlas of NSW Wildlife (Bionet Atlas)
- Commonwealth Department of Agriculture, Water and the Environment (DAWE) Protected Matters Search Tool (PMST)
- Biodiversity Conservation Division Threatened Species Profile Database.

6.7.1 Existing environment

Vegetation communities

The Proposal area is located within a highly disturbed environment, resulting from construction of the rail corridor and rail operations. All vegetation observed within the vicinity of the Proposal area comprised of ornamental planted exotic and native species, along with a small area of exotic perennial grasses, that do not form part of any recognised native NSW Plant Community Type (PCT).

Flora

A total of 23 trees within the Proposal area were assessed for their tree significance. Of these, one was assessed as having high significance, eight were assessed as having moderate significance, and 14 were assessed as having low significance as shown in Table 6-17. The location of these trees is shown in Figure 6-11.

Table 6-17 Identified trees in the Proposal area

Tree ID	Species	Heights (metres)	Significance	Location and Impact
1	*Angophora floribunda*	8	Medium	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.
2	*Acmena smithii var. minor*	2	Low	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.

Tree ID	Species	Heights (metres)	Significance	Location and Impact
3	*Acacia longifolia*	3	Low	This tree is dead and therefore recommend for removal.
4	*Ulmus sp.*	3	Low	This tree is in severe decline and therefore recommended for removal.
5	*Casuarina cunninghamiana*	26	High	A minor encroachment within the tree protection zone (TPZ) may be caused by potential grading works. The grading works will be limited to 150 millimetres below grade and have a negligible impact on the subject tree.
6	*Casuarina cunninghamiana*	28	Medium	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.
7	*Casuarina cunninghamiana*	20	Low	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.
8	*Casuarina cunninghamiana*	20	Low	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.
9	*Casuarina cunninghamiana*	24	Medium	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.
10	*Cupressus torulosa*	19	Medium	This tree is required to be removed for construction access. It is located within the clearances needed for a large crane to manoeuvre the Platform 3 lift shaft into position.
11	*Cupressus torulosa*	18	Medium	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.
12	*Lagerstroemia indica*	3	Low	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.
13	*Schinus areira*	12	Medium	Minor pruning will be required to establish a 3.5 metre overhead clearance for the installation of temporary site sheds.
14	*Ficus benjamina*	12	Medium	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.

Tree ID	Species	Heights (metres)	Significance	Location and Impact
15	*Callistemon viminalis*	5	Low	A major encroachment within the TPZ may be caused by potential regrading work. The regrading work would be limited to 150 millimetres below grade and have a negligible impact on the subject tree.
16	*Callistemon viminalis*	5	Low	A major encroachment within the TPZ may be caused by potential regrading work. Minor pruning would be required to establish 2.5 metre overhead clearance for machinery access.
17	*Callistemon viminalis*	5	Low	This tree is located outside the disturbance footprint. Minor pruning would be required to establish 2.5 metre overhead clearance for machinery access.
18	*Callistemon viminalis*	5	Low	This tree is located outside the disturbance footprint. Minor pruning would be required to establish 2.5 metre overhead clearance for machinery access.
19	*Callistemon viminalis*	5	Low	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.
20	*Callistemon viminalis*	5	Low	This tree is located outside the disturbance footprint. No impacts on this tree are foreseeable under the Proposal.
21	*Callistemon viminalis*	6	Low	A major encroachment within the TPZ may be caused by potential regrading work. The regrading work would be limited to 150 millimetres below grade and have a negligible impact on the subject tree.
22	*Callistemon viminalis*	6	Low	A major encroachment within the TPZ may be caused by potential regrading work. The regrading work would be limited to 150 millimetres below grade and have a negligible impact on the subject tree.
23	*Callistemon viminalis*	6	Medium	A major encroachment within the TPZ may be caused by potential regrading work. The regrading work would be limited to 150 millimetres below grade and have a negligible impact on the subject tree.

Legend

- Proposal area
- Proposed works (permanent impact)
- Crane area / access (temporary impact)
- Site compound (temporary impact)
- Laydown area (temporary impact)
- Cadastre

The subject trees

- No encroachment
- Minor encroachment
- Major encroachment

Protection Zones

- Tree Protection Zone (TPZ)
- Structural Root Zone (SRZ)

FIGURE 6-11

1:1,500 Scale at A4

m

0 10 20 30 40

Biodiversity

EAST HILLS STATION

Map Produced by Cardno NSW/ACT Pty Ltd (WOL)
Date: 2020-11-12 | Project: NE30047
Coordinate System: GDA 1994 MGA Zone 56
Map: NE30047-GS-006-Biodiversity.mxd 03
Aerial imagery supplied by Nearmap (October, 2020)
Cadastre supplied by NSW LRS

The following exotic flora species were identified within the site compound area during the site inspection:

- Pepper Tree (*Schinus molle*), exotic
- Candian Fleabane (*Conyza Canadensis*), exotic
- Flatweed (*Hypochaeris radicata*), exotic
- Prickly Lettuce (*Lactuca serriola*), exotic
- Dandelion (*Taraxacum officinale*), exotic
- Ribwort (*Plantago lanceolate*), exotic
- Creeping Speedwell (*Veronica persica*), exotic
- A Finger Grass (*Digitaria sp.*), exotic
- African Lovegrass (*Eragrostis curvula*), exotic
- Black Nightshade, Black-berry Nightshade (*Solanum nigrum*), exotic.

Threatened flora and fauna

A search using the EPBC Act protected matters search tool with a ten kilometre radius of the Proposal area was undertaken on the 11 August 2020 identified 74 threatened species, nine threatened ecological communities and 40 migratory species that were considered to have the potential to occur within the locality of the Proposal area.

A search of the Bionet Atlas pf NSW Wildlife identified two sightings of the Grey-headed Flying-fox (*Pteropus poliocephalus)* within 200 metres of the Proposal area. No other threatened species are identified as occurring within 200 metres of the Proposal area.

Following the site inspection and desktop analysis it is considered that the potential for occurrence of threatened fauna species within the Proposal area is low based on the disturbed nature of the area and the limited habitat available.

Fauna habitat

The fauna habitat within the Proposal area is limited, with the majority of vegetation in the form of planted native and exotic trees and shrubs. Large areas of original vegetation within the Proposal area has been cleared for urban development and what remains is landscape gardens and plantings.

The Proposal area does not provide any significant habitat for fauna and species likely to use resources are those that are well adapted to urban environments or those species that are highly mobile (such as birds and bats). The surrounding trees (both native and introduced) provide some foraging habitat (such as fruits and seeds) for mobile species (such as birds and bats). It is unlikely that these resources are heavily used or relied upon by the majority of fauna but instead are intermittently used while foraging within the greater locality.

Weeds

No priority weeds listed under the *Biosecurity Act 2015* for the Greater Sydney Region were identified in the Proposal area.

6.7.2 Potential impacts

a) Construction phase

Direct impacts

Direct impacts to biodiversity as a result of the Proposal are considered negligible due to the existing disturbed nature of the available habitat and the nature of the construction work to be undertaken.

Vegetation clearing would include the removal of three trees during construction. These are one dead *Acacia longifolia* tree (tree ID – 3), one semi mature *Ulmus sp*. tree (tree ID – 4) and one mature *Cupressus torulosa* tree (tree ID – 10). In addition the exotic vegetation in the site compound on Thompson Lane would be cleared, an area of approximately 0.34 hectares.

Canopy pruning for one *Schinus areira* (tree ID – 13) and three *Callistemon viminalis* (tree ID – 16, 17 and 18) would be required for footpath regarding along Maclaurin Avenue and also one *Cupressus torulosa* (tree ID – 11) is required for the establishment of the site compound on Thompson Lane. The pruning is unlikely to impact the overall health and condition of the trees and is preferable over tree removal.

A total of 20 trees within the Proposal area would be retained and protected as part of the Proposal with the installation of tree protection fences. The trees proposed for removal would require offsetting as per the Transport for NSW *Vegetation Offset Guide* (TfNSW 2019b). Six replacement trees are required to be planted in accordance with this guideline.

Indirect impacts

The most likely indirect impact arising from the Proposal is the introduction, establishment and spread of weeds within the Proposal area and to adjoining areas of vegetation. Weed establishment and spread generally results from soil disturbance and excavation as well as use of equipment that may carry weed propagules.

Mitigation measures to be implemented during the construction and operational phases of the Proposal are recommended to manage and control the incidence and effect of weeds on the receiving environment.

Impacts to threatened fauna

No threatened fauna are likely to be significantly impacted by the Proposal. It is unlikely that any threatened fauna identified within the locality would have a moderate to high likelihood to utilise the habitat within the Proposal area, nor are any threatened fauna likely to be reliant on the habitat to be removed or impacted.

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

The vegetation identified within the Proposal area does not contain important habitat features (i.e. hollows for breeding) for any potential threatened species known or predicted to occur within the locality. Given this, the Proposal is considered unlikely to significantly affect threatened species or ecological communities, or their habitats.

Noise, light and vibrations on wildlife

It is likely that noise from the existing rail corridor and arterial roads would already be impacting background levels of noise in the Proposal area. However, construction of the Proposal (along with its ancillary activities) may cause disturbance to animals. The impacts from noise emissions are likely to be localised close to the Proposal and are not likely to have a significant long-term impact on wildlife populations, given that populations are already

exposed to noise associated with the existing rail corridor. Furthermore, it is likely that most animal species would habituate to periodic noise disturbance from regular maintenance activities (Forman *et al.*, 2000).

Key Threatening Processes

Key Threatening Processes are listed under Schedule 4 of the BC Act and EPBC Act. There are no relevant Key Threatening Processes that have the potential to affect biodiversity values within the Proposal area. The proposed vegetation removal is not of a scale to cause significant impacts.

Weeds

The Proposal is would not impact any priority weeds listed under the *Biosecurity Act 2015* for the Greater Sydney Region as non were identified within the Proposal area.

b) Operational phase

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

6.7.3 Mitigation measures

The following mitigation measures are proposed to manage potential biodiversity impacts:

- construction of the Proposal must be undertaken in accordance with the Transport for NSW *Vegetation Management (Protection and Removal) Guideline* (2019d) and the Transport for NSW *Fauna Management Guideline* (2019e)
- 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
- disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. The trees nominated to be removed in the Arboricultural Impact Assessment Report (Tree Survey Arboricultural Consultants, 2020) would be clearly demarcated onsite prior to construction, to avoid unintended vegetation removal.
- A Tree Protection Plan would be implemented to protect trees to be retained as outlined in the Arboricultural Impact Assessment Report (Tree Survey Arboricultural Consultants, 2020). Tree protection would include tree protection fencing and site inspections
- in the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, as soon as practicable
- should the detailed design or onsite work determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete Transport for NSW's Tree Removal Application Form and submit it to Transport for NSW for approval
- for new landscaping work, mulching and watering would be undertaken until plants are established
- weed control measures, consistent with the Transport for NSW *Weed Management and Disposal Guideline* (TfNSW, 2019f), would be developed and implemented as

part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the *Biosecurity Act 2015*.

- Offsets and/or landscaping would be undertaken in accordance with Transport for NSW's *Vegetation Offset Guide* (TfNSW, 2019b) and in consultation with City of Canterbury-Bankstown Council. The three trees earmarked for removal would be offset with a minimum of six trees as advised in the Arboricultural Impact Assessment Report (Tree Survey Arboricultural Consultants, 2020). Any additional clearing would also require tree offset planting.

6.8 Contamination, landform, geology and soils

6.8.1 Existing environment

Landform, geology and soils

The landform surrounding the Proposal area falls within the Lucas Heights Residual Landscape, which is represented by gently undulating crests and ridges with low open forest and dry schlerophyll woodland (Soil Landscapes of the Penrith 1:100,000 sheet, 2010, Bannerman and Hazelton, 2011). This landscape grouping has local relief to 30 metres and slopes less than 10 per cent (Soil Landscapes of the Penrith 1:100,000 sheet, 2010, Bannerman and Hazelton, 2011).

East Hills Station itself is relatively flat with an approximate elevation of 15 metres Australian Height Datum (AHD) from the edge of Georges River. The rail corridor is slightly elevated above the nearby properties and the railway line is situated on an elevated embankment, bridging over Maclaurin Avenue, Cook Crescent and Georges River.

The Proposal area is located on Hawkesbury Sandstone, which is characterised by medium to very coarse-grained quartz sandstone with minor laminated mudstone and siltstone lenses (Penrith 1:100,000 Geological Map, 1991, Clark and Jones, 1991).

The Soil Landscape of the Penrith 1:100,000 sheet (Bannerman and Hazelton, 2011) indicates that the Lucas Heights Residual Landscape is defined by moderately deep (50 to 150 centimetres), hard setting Yellow Podzolic Soils and Yellow Soloths that have low soil fertility and low water holding capacity. In close proximity to the Proposal, north east of Georges River, Tenosol soil profiles can also be found. The erosion hazard rating of these soils is slight with no evidence of salinity.

The Proposal area is classified as Class 5 for likelihood of acid sulfate soils (ASS) being present (Bankstown LEP 2015 Acid Sulfate Soils Map Sheet ASS_003, 2015). Class 5 areas are defined as typically not containing any acid sulfate soils but are located within 500 metres of Class 1, 2, 3 or 4 areas (DPIE, 2020). This is reflective of the Proposal area which is approximately 200 metres from Class 2 ASS, which is defined as likely to contain ASS below the natural ground surface (DPIE, 2020).

Contamination

During the site inspection an emergency shower and eye wash was identified in the proposed compound area, in the vicinity of the proposed Lift 2 structure, indicating the potential for the area to have previously been used as a chemical storage area. Activities associated with the chemical storage may have contaminated soil and ground water in the area.

A search of the NSW EPA Contaminated Land Record on 6 October 2020 returned no records of regulatory notices of land under the *Contaminated Land Management Act 1997*. A search of the list of NSW contaminated sites notified to EPA on 6 October 2020 returned no records of written notices issued by the EES notifying an investigation of contaminated land. However, railway corridors have the potential for contaminants to be present as a result of historical and

operational sources. Possible sources of contamination may include fill materials, hazardous materials from structures, leaks and spills of fuels or chlorinated hydrocarbons, historical use of pesticides, asbestos dust from train brake pads and other leaks or spills from maintenance and operational activities.

6.8.2 Potential impacts

a) Construction phase

The Proposal would require excavation work for the installation of lift foundations and footings. Other trenching or excavation may be required for footpaths, relocation of services, drainage work and tree removal (refer to Section 6.7). Excavation and other earthworks are described in more detail in Section 3.4.1, and if such activities are not adequately managed, could result in the following impacts:

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

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

b) Operational phase

The Proposal is not expected to result in ongoing impacts to contamination, landform, geology and soils during the operational phase as there is no change to land use.

6.8.3 Mitigation measures

The following mitigation measures are proposed with respect to potential contamination and soil impacts:

- due to past activities in the area a preliminary site investigation, with limited soil sampling, would be undertaken in the vicinity of the compound area and the Lift 2 structure to determine the potential for contamination and site suitability for intended use
- prior to commencement of work, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction
- 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 SafeWork NSW requirements
- 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

- all spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal.

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

6.9 Hydrology and water quality

6.9.1 Existing environment

Surface water

Georges River is located about 340 metres from East Hills Station. It is expected runoff from the rail corridor and station area would generally discharge to Council's stormwater infrastructure.

Hydrology

BMT WBM (2009) completed a flood study for the East Hills stormwater catchment including East Hills Station on behalf of City of Canterbury-Bankstown Council. The study defines the flood behaviour throughout the catchment and assesses the flooding behaviour due to stormwater runoff from the catchment.

East Hills is a sub-catchment within the mid-Georges River catchment and covers an area of about 40 hectares. The sub-catchment topography rises from the river banks of the Georges River (below 0 metres AHD) to about 15 metres AHD at the entrance of the Proposal on Park Road.

Flood modelling indicates the sub-catchment is susceptible to 20 year, 50 year and 100 year Annual Recurrence Interval (ARI) and Probable Maximum Flood (PMF) events. The Provisional Flood Risk Precinct Map for the Proposal area is shown on Figure 6-12 (BMT WBM, 2009). The map is based on consideration of both flood conditions resulting from flooding of the Georges River, as well as flooding due to catchment runoff events. The proposed location of the compound area, and a small portion of the footpath along Maclaurin Avenue are identified as a medium flood risk.

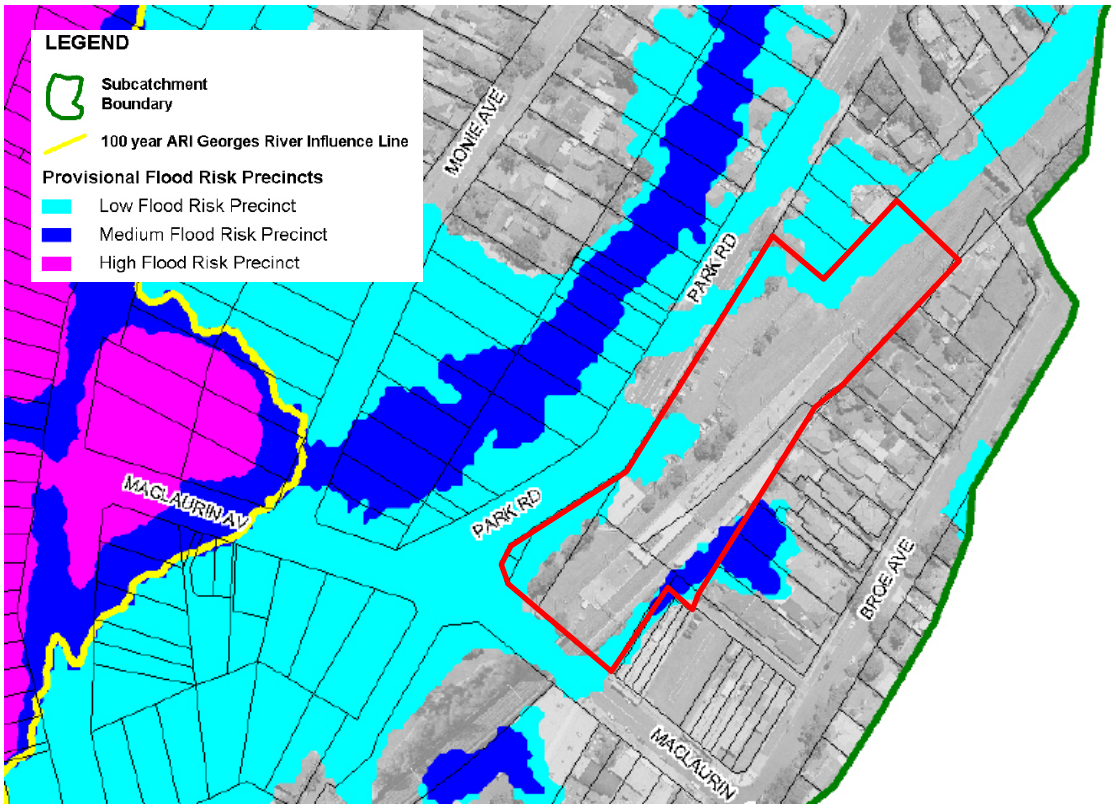


Figure 6-12 Provisional Flood Risk (Source: BMT WBM, 2009)

Groundwater

The depth to groundwater within the Proposal area is unknown. A search of the WaterNSW groundwater database has indicated there are no registered groundwater bores within the 500 metres of the Proposal area.

6.9.2 Potential impacts

a) Construction phase

Flooding of the compound site along Thompson Lane would be a risk that would need to be appropriately managed. If flooding was to occur during the construction of the Proposal, the site compound along Thompson Lane may be inundated with water, which may cause damage to plant and equipment and pollute the floodwater and surrounding environment with construction materials, sediment and chemicals. The construction methodology, and design of the site compound would be planned to ensure impacts from flood events in the site area are minimised and so the floodwater does not cause damage to partially built and temporary built infrastructure.

Activities that would disturb soil during construction work would have the potential to impact on local waterways as a result of erosion and sedimentation.

Additionally, while groundwater levels were not determined as part of this assessment, areas of excavation may need to be locally dewatered as a result of potential groundwater seepage or rainfall runoff (such as within the vicinity of the excavations for the left adjacent to Thompson Lane). Incorrect dewatering may pose risks to nearby waterways where run-off travels from the site to these areas.

Pollutants such as fuel, chemicals or wastewater from accidental spills could potentially reach nearby stormwater drains and flow into downstream waterways, impacting on water quality and ecological values.

b) Operational phase

The Proposal is not likely to impact on the hydrology of the East Hills sub-catchment. The upgrades to the footpath along Maclaurin Avenue and the station entrances along Park Road and Thompson Lane may result in a minor alteration to the surface water flow. The detailed design of the proposal would address stormwater management risks. Any alterations to surface water flows would likely to be within the capacity of the stormwater network, impacts are considered to be minor.

6.9.3 Mitigation measures

The following mitigation measures are proposed to manage potential on hydrology and water quality impacts:

- appropriate procedures to manage the effects of flooding during construction and minimise adverse environmental impacts to the greatest extent possible, would be incorporated in the CEMP
- no stockpiles of material or storage of fuels or chemicals would be located within high/medium flood risk areas or adjacent to existing waterways
- the existing drainage systems would remain operational throughout the construction phase
- should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and Transport for NSW's *Water Discharge and Reuse Guideline* (TfNSW, 2019g)
- Other mitigation measures that would be required for construction and detailed in a CEMP include regular vehicle and equipment maintenance, hazardous liquid and spill management measures.

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

6.10 Air quality

6.10.1 Existing environment

Existing land uses around the Proposal are representative of a residential urban environment. Proposal area does not contain any major industrial operations, quarries or landfills. Further, a search of the NSW Planning Portal, operated by the DPIE did not identify any major projects within and around the Proposal. Therefore, air quality in the Proposal area would be dominated by motor and railway vehicle emissions.

There are no air quality monitoring stations of the NSW Air Quality Monitoring Network in the Proposal area. The closest monitoring stations are located in Chullora, Earlwood and Liverpool. Data collected from these stations between January 2019 to January 2020 indicate that nitrogen dioxide (NO_2), sulfur dioxide (SO_2) and air particles (PM_{10}) were well below the accepted maximum concentration standards set out in the National Environmental Protection (Ambient Air Quality) Measure (NEPM) (2003).

Potential sensitive receivers around the Proposal include:

- local residents and pedestrians frequenting Park Road, Maclaurin Avenue, Thompson Lane and Broe Avenue
- local businesses located in the vicinity of East Hills Station
- staff and commuters at East Hills Station

- community facilities, in particular, Disability Services Australia located on 49 Maclaurin Avenue adjacent to the Park Road roundabout.

6.10.2 Potential impacts

a) Construction phase

The Proposal would likely have a minimal to minor impact on air quality as it would include extensive excavation work which has the potential to generate significant quantities of dust. Standard mitigation measures would be applied and further described in Section 6.10.3.

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

b) Operation phase

The Proposal would increase access to public transport and the use of public transport is expected to increase while private vehicle use is expected to decrease.

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

6.10.3 Mitigation measures

The following mitigation measures are proposed to manage potential air quality impacts:

- air quality management and monitoring for the Proposal would be carried out in accordance with Transport for NSW's *Air Quality Management Guideline* (TfNSW, 2019h)

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

6.11 Waste

6.11.1 Potential impacts

a) Construction phase

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

- demolition waste (including asphalt and concrete) excavated soil building material waste (including metals, timbers, plastics and concrete) surplus building materials, electrical wiring and conduit waste
- spoil from earthwork
- green waste (including weeds)
- general waste (including food waste generated by construction workers)
- packaging material waste
- fuels, liquids and chemicals (from construction plant and equipment).

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

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

NSW guidelines. Waste management targets in consideration of the Infrastructure Sustainability Rating Scheme – Version 1.2 (ISCA, 2017) would be developed for the Proposal and would include reuse and recycling.

b) Operational phase

During the operation of the Proposal, there would not be an increase in the amount or change the type of waste generated.

6.11.2 Mitigation measures

The following mitigation measures are proposed to manage potential waste impacts:

- the CEMP (or separate Waste Management Plan, if necessary) would be prepared.

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

6.12 Sustainability

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

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

6.13 Climate change

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

Climate change could lead to an increase in the intensity of rainfall events, whereby the rainfall expected to occur in a 100-year average recurrence interval flood event would occur more frequently. The drainage system for the canopies have been designed in accordance with relevant Australian Guidelines and the Building Code of Australia (BCA).

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

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

- a hydrological assessment would be undertaken to ensure that the Proposal would not increase the potential flooding within the Proposal area
- selection of materials for durability in extreme conditions and that minimise heat retention
- incorporate fire resistant/retarding materials wherever practicable
- incorporate engineering and design features to ensure structures are constructed to minimise direct impacts from severe storms and strong winds.

6.14 Greenhouse gas emissions

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

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

Due to the small scale of the Proposal and the short term temporary nature of the individual construction work, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation which include:

- Detailed design and construction of the Proposal is to be undertaken in accordance with the ISCA Infrastructure Sustainability Rating Scheme (v1.2)
- The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (TfNSW, 2019i) or other approved modelling tools. The carbon footprint would to be used to inform decision making in design and construction.

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

6.15 Cumulative impacts

6.15.1 Existing or potential projects

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

A search of the DPIE Major Projects Register, Sydney South Joint Regional Planning Panel Development and Planning Register, and City of Canterbury-Bankstown Council Development Application Register on 12 October 2020 identified a number of proposals and projects within City of Canterbury-Bankstown LGA. The following projects have been identified as the most likely to contribute to cumulative impacts from the Proposal, due to their timing, scale and/or proximity to the Proposal, these are:

- M5 Motorway – West Widening located about six kilometres from the Proposal area (Status: determination)
- Kelso Waste Facility located about two kilometres from the Proposal area (Status: determination).

In addition a number of small-scale local development projects within the broader Proposal area were identified, however, it is anticipated these small-scale local developments would not significantly impact the proposal.

6.15.2 Potential impacts

a) Construction phase

During construction, the work would be coordinated with any other construction activities in the area, including the M5 Motorway – West Widening and the Kelso Waste Facility. The M5 Motorway – West Widening would involve the widening of the eastbound and westbound carriageways from two to three lanes between Camden Valley Way and Hume Highway and between Moorebank Avenue and Fairford Road. The Kelso Waste Facility project is the proposed development of a new waste processing plant.

Consultation and liaison would occur with City of Canterbury-Bankstown Council, TAHE/Sydney Trains, and any other developers identified, including Liverpool City Council and Transport for NSW in regards to the M5 Motorway – West Widening and BMG Environmental Waste Management in regards to the Kelso Waste Facility, 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 Chapter 7 are implemented.

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

b) Operational phase

During the operation of the Proposal, the impacts to projects identified above would be negligible due to the location of the projects with respect to the proposal.

6.15.3 Mitigation measures

In addition to the mitigation measures designed to reduce the environmental impacts of the Proposal itself, the following mitigation measures would be implemented to ensure that cumulative impacts from other construction work is minimised:

- consultation and liaison would occur with City of Canterbury-Bankstown Council, TAHE/Sydney Trains, and any other developers identified, including Liverpool City Council and Transport for NSW in regards to the M5 Motorway – West Widening and BMG Environmental Waste Management in regards to the Kelso Waste Facility
- 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.

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

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 to minimise the impacts of the Proposal identified in Chapter 6.

7.1 Environmental management plans

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

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

7.2 Mitigation measures

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

Table 7-1 Proposed mitigation measures

No.	Mitigation measure
	General
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of *Environmental Management Plan Guideline – Guideline for Infrastructure Projects* (DPIE, 2020) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the Contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An Environmental Controls Map (ECM) would be developed by the Contractor in accordance with Transport for NSW's *Guide to Environmental Controls Map* (TfNSW, 2019j) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.

No.	Mitigation measure
6.	Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on the ECM to avoid direct impacts during construction.
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by Transport for NSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.
	Traffic and site access
8.	A Traffic Management Plan (TMP) would be prepared as part of the CEMP prior to the commencement of construction, and implemented for the duration of the construction phase. The TMP 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 of existing taxi rank and proposed kiss and ride, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired • measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the TMP.
9.	Consultation with City of Canterbury-Bankstown Council would be undertaken during preparation of the TMP. The performance of all project traffic arrangements would be monitored during construction.
10.	Notifications would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work.
11.	Road occupancy licences (ROL) for temporary road closures would be obtained from City of Canterbury-Bankstown Council, where required.
12.	Qualified traffic controllers would be used during construction work to ensure safe and efficient movement of vehicle and pedestrian traffic on the external road as well as in and out of the construction site.

No.	Mitigation measure
13.	Construction workers would be required to park away from the station (i.e. not within the existing commuter car parks) or within the nominated construction compounds, and encouraged to car pool where practicable
14.	Fencing and barriers would be installed between the construction site and outside the construction site to ensure safe and easy navigation of pedestrians and cyclists.
	Urban design, landscape and visual amenity
15.	Mitigation measures would be reviewed and revised where appropriate during detailed design development and construction planning to minimise the level of visual impact of the construction and operation phases of the Proposal.
16.	An Urban Design Plan (UDP) would be prepared by the Contractor, in consultation with City of Canterbury-Bankstown Council, and submitted to Transport for NSW 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) • 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 bike's 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 and 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.
17.	A Public Domain Plan (PDP) would be prepared by the Contractor, in consultation with City of Canterbury-Bankstown Council, and submitted to Transport for NSW for endorsement by the Sustainability and 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 bike pathways, street furniture including relocated bus and taxi facilities, bike 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 any relevant Infrastructure Sustainability Rating Scheme - Version 1.2 (ISCA, 2017) requirements • identification of design and landscaping aspects that will be open for stakeholder input, as required.

No.	Mitigation measure
18.	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*.
19.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
20.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
21.	During construction, graffiti would be removed in accordance with Transport for NSW Standard Requirements.
22.	Reduce visual clutter by minimising new fencing and signage.
23.	Ensure selected colours complement the station, particularly the lift shafts.
24.	Further investigation of construction methods that may allow for the retention of the large Cypress tree on the eastern side of the station would be undertaken
	Noise and vibration
25.	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* (DECC, 2009), *Construction Noise and Vibration Strategy* (TfNSW, 2019a) and the Noise and Vibration Impact Assessment (NVIA) for the Proposal (Cardno, 2020). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
26.	The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include: • regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise • avoiding any unnecessary noise when carrying out manual operations and when operating plant • ensuring spoil is placed and not dropped into awaiting trucks • avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable • switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded • avoiding deliveries at night/evenings wherever practicable • no idling of delivery trucks • keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site • minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios onsite; no dropping of materials from height where practicable, no throwing of metal items and slamming of doors.

No.	Mitigation measure
27.	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.
28.	Work would generally be carried out during standard construction hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Any work outside these hours may be carried out if approved by Transport for NSW and the community is notified prior to this work commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the Transport for NSW Environment and Planning Manager for any work outside normal hours.
29.	As per the *Construction Noise and Vibration Strategy* (TfNSW, 2019a), construction activities with special audible characteristics (high noise impact, intensive vibration, impulsive or tonal noise emissions) would be limited to standard hours, starting no earlier than 8am; and to continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block, unless otherwise approved by Transport for NSW.
30.	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.
31.	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 NVIA (Cardno, 2020) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
32.	Vibration (other than from blasting) resulting from construction and received at any structure outside of the project would be managed in accordance with: • for structural damage – British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings Part 2 and German Standard DIN 4150:Part 3 – 1999: Structural Vibration in Buildings: Effects on Structures • For human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (DEC, 2006) which includes British Standard BS 6472-2:1992 *Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).*
33.	Property conditions surveys would be completed prior to any vibration intensive work (such as piling or jack hammering) being carried out at or within the minimum distances set out in the Transport for NSW *Construction Noise and Vibration Strategy* (TfNSW, 2019a) and the NVIA (Cardno, 2020).

No.	Mitigation measure
34.	Use of temporary noise barriers where feasible. The height and location of these barriers would be determined during preparation of the CNVMP and would take into consideration the location of residential receivers along Thompson Lane and Park Road to ensure that 'line of sight' is broken, where feasible.
35.	Use of acoustic curtains (generally loaded vinyl based products), attached to wire construction fencing or laid over steel scaffold will be investigated for stationary plant within the worksites during preparation of the CNVMP.
36.	Provide respite periods where noise levels are highly intrusive. Noise with special audible characteristics and vibration generating activities (including jack hammering, pile driving and vibratory rolling) may only be carried out in continuous blocks, not exceeding 3 hours each, with a minimum respite period of one hour between each block.
37.	Provision of temporary noise barriers along the rear of the Thompson Lane construction compound with no gaps and around specific activities will be investigated further as part of the CNVMP.
38.	Provision of scaffolding and mobile noise curtains/blankets immediately around higher noise generating plant will be investigated further as part of the CNVMP.
39.	Carry out Stage 2b "Platform works – services (worst case)" during standard hours only, where possible.
40.	Take into consideration measures for reducing the source noise levels of construction equipment by construction planning (limited hours/duration) and equipment selection where practicable
41.	Conduct short term background noise monitoring prior to construction to confirm the ambient noise levels, if ambient conditions (the level of background activity) are considered to have changed as a result of changes to COVID 19 response.
42.	Where receivers are located within the safe work distance zones, vibration monitoring should be carried out to ensure compliance with the required criteria. If exceedances are recorded, work should be modified accordingly to reduce vibration levels.
	Indigenous heritage
43.	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.

No.	Mitigation measure
44.	If unexpected Indigenous heritage objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW 2019c) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Heritage NSW and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured, and the NSW Police and Heritage NSW notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to work recommencing at the location.
	Non-Indigenous heritage
45.	A heritage induction would be provided to workers prior to construction, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction.
46.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW 2019c) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and DPIE. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.
	Socio-economic
47.	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.
48.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
49.	A Community Liaison Management 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
50.	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.
51.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Management Plan to be developed prior to construction.
	Biodiversity
52.	Construction of the Proposal must be undertaken in accordance with the Transport for NSW *Vegetation Management (Protection* and *Removal) Guideline* (2015d) and the Transport for NSW *Fauna Management Guideline* (2015e).

No.	Mitigation measure
53.	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.
54.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. The trees nominated to be removed in the *Arboricultural Impact Assessment Report* (Tree Survey Arboricultural Consultants, 2020) would be clearly demarcated onsite prior to construction, to avoid unintended vegetation removal.
55.	A Tree Protection Plan would be implemented to protect trees to be retained as outlined in the Arboricultural Impact Assessment Report (Tree Survey Arboricultural Consultants, 2020). Tree protection would include tree protection fencing and site inspections
56.	In the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, as soon as practicable.
57.	Should the detailed design or onsite work determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete Transport for NSW's Tree Removal Application Form and submit it to Transport for NSW for approval.
58.	For new landscaping work, mulching and watering would be undertaken until plants are established.
59.	Weed control measures, consistent with the Transport for NSW *Weed Management and Disposal Guideline* (TfNSW, 2015f), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the *Biosecurity Act 2015*.
60.	Offsets and/or landscaping would be undertaken in accordance with Transport for NSW's *Vegetation Offset Guide* (TfNSW, 2019b) and in consultation with City of Canterbury-Bankstown Council. The three trees earmarked for removal would be offset with a minimum of six trees as advised in the Arboricultural Impact Assessment Report (Tree Survey Arboricultural Consultants, 2020). Any additional clearing would also require tree offset planting.
	Contamination, soils and geology
61.	Due to past activities in the area a preliminary site investigation, with limited soil sampling, would be undertaken in the vicinity of the compound area and the Lift 2 structure to determine the potential for contamination and site suitability for intended use.
62.	Prior to commencement of work, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of work and maintained throughout construction.

No.	Mitigation measure
63.	Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the work is complete and areas are stabilised.
64.	An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with SafeWork NSW requirements.
65.	All spoil to be removed from site would be tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility.
66.	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal.
	Hydrology and water quality
67.	Appropriate procedures to manage the effects of flooding during construction and minimise adverse environmental impacts to the greatest extent possible, would be incorporated in the CEMP.
68.	No stockpiles of material or storage of fuels or chemicals would be located within high/medium flood risk areas or adjacent to existing waterways.
69.	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.
70.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and Transport for NSW's *Chemical Storage and Spill Response Guidelines* (TfNSW, 2015).
71.	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 Transport for NSW's *Chemical Storage and Spill Response Guidelines* (TfNSW, 2019l) 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.
72.	In the event of a pollution incident, work would cease in the immediate vicinity and the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the POEO Act.
73.	The existing drainage systems would remain operational throughout the construction phase.
74.	Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and Transport for NSW's *Water Discharge and Reuse Guideline* (TfNSW, 2019g).

No.	Mitigation measure
	Air quality
75.	Air quality management and monitoring for the Proposal would be carried out in accordance with Transport for NSW's *Air Quality Management Guideline* (TfNSW, 2019h).
76.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
77.	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.
78.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
79.	To minimise the generation of dust from construction activities, the following measures would be implemented: • apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) • cover stockpiles when not in use • appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading • prevent mud and dirt being tracked onto sealed road surfaces.
	Waste
80.	The CEMP (or separate Waste Management Plan, if necessary) would address waste management and would at a minimum: • identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data.
81.	Any concrete washout would be established and maintained in accordance with Transport for NSW's *Concrete Washout Guideline* – draft (TfNSW, 2019m) with details included in the CEMP and location marked on the ECM.
	Climate change and greenhouse gases
82.	Detailed design and construction of the Proposal is to be undertaken in accordance with the ISCA Infrastructure Sustainability Rating Scheme (v1.2).
83.	The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (TfNSW, 2019i) or other approved modelling tools. The carbon footprint would to be used to inform decision making in design and construction.
	Cumulative impacts

No.	Mitigation measure
84.	Consultation and liaison would occur with City of Canterbury-Bankstown Council, TAHE/Sydney Trains, and any other developers identified, including Liverpool City Council and Transport for NSW in regards to the M5 Motorway – West Widening and BMG Environmental Waste Management in regards to the Kelso Waste Facility.
85.	The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed in the CEMP, and implemented as appropriate.

8 Conclusion

This REF has been prepared in accordance with the provisions of Section 5.5 of the EP&A Act, taking into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The Proposal would provide the following benefits:

- a station that is accessible to people with a disability, limited mobility, parents with prams and people with luggage
- upgraded buildings and facilities for all modes that meet the needs of a growing population
- improved interchange and access facilities that supports an integrated network and allows seamless transfers between all modes for all customers.

The likely key impacts of the Proposal are as follows:

- minor impacts on local traffic flow associated with construction traffic and construction
- introduction of new elements, such as the station entrance, lift and associated weather canopies, to the visual environment
- temporary noise and vibration impacts associated with construction activities
- removal of three trees
- potential sediment runoff, dust generation and erosion risk during construction
- risk of flooding of compound site at Thompson Lane during construction
- disruption to station facilities and amenities during construction
- changes to vehicular, bike and pedestrian access around the station during construction
- reduction in parking availability for customers and local residents during construction.

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

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

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Appendix A Consideration of matters of National Environmental Significance

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

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 near the Proposal site.	Nil.
Any impact on a wetland of international importance? There are no wetland of international importance near the Proposal site.	Nil.
Any impact on a listed threatened species or communities? The Proposal is unlikely to significantly affect listed threatened species, populations or communities.	Nil.
Any impacts on listed migratory species? The Proposal is unlikely to significantly affect listed migratory species due to the highly urban nature of the site.	Nil.
Does the Proposal involve a nuclear action (including uranium mining)? The Proposal does not involve a nuclear action.	Nil .
Any impact on a Commonwealth marine area? The Proposal site is not near a Commonwealth marine area.	Nil.
Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? The Proposal is for a transport facility and does not relate to coal seam gas or mining.	Nil.
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be carried out on or near to Commonwealth land.	Nil.

Appendix B Consideration of clause 228

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

Factor	Impacts
(a) Any environmental impact on a community? The Proposal would have some temporary impacts to the community during construction, particularly in relation to noise, traffic and access and visual amenity. Mitigation measures outlined in Table 7-1 would be implemented to manage and minimise adverse impacts. Operation of the Proposal would result in long-term positive impacts due to improved accessibility, amenity, safety and comfort.	Minor
(b) Any transformation of a locality? The Proposal would involve the introduction of new visible elements in the landscape (two new lifts, family accessible toilet, male and female ambulant toilets, formal kiss and ride zone and station entrance upgrade). The appearance of the new elements would be consistent with the existing station elements and are considered to be common features in urban areas.	Minor
(c) Any environmental impact on the ecosystem of the locality? The Proposal would require minor vegetation removal. However, given the Proposal's location within an urbanised environment and the low habitat value of the trees to be removed, impacts to biodiversity and ecosystems are expected to be negligible.	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. Minor vegetation removal would be required from the western side of the station. However, the number of trees to be removed has been minimised as far as possible.	Minor
(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? The Proposal would not impact any known heritage items within the Proposal area.	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.	

Factor	Impacts
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The Proposal is unlikely to have any impact on endangering any species of animal, plant or other form of life, whether living on land, in water or in the air.	Nil.
(h) Any long-term effects on the environment? The Proposal is unlikely to have any long-term effects on the environment.	Nil
(i) Any degradation of the quality of the environment? The Proposal is unlikely to have any degradation on the quality of the environment.	Nil
(j) Any risk to the safety of the environment? The Proposal is unlikely to cause any pollution or safety risks to the environment provided the recommended mitigation measures are implemented.	Nil
(k) Any reduction in the range of beneficial uses of the environment? The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.	Nil
(l) Any pollution of the environment? The Proposal is unlikely to cause any pollution or to the environment provided the recommended mitigation measures are implemented.	Nil
(m) Any environmental problems associated with the disposal of waste? All waste would be managed and disposed of with a site-specific Waste Management Plan. Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.	Nil
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Proposal is unlikely to increase demands on resources that are or are likely to become in short supply.	Nil
(o) Any cumulative environmental effect with other existing or likely future activities? Cumulative effects of the Proposal are described in Section 6.12. Where feasible, environmental management measures would be co-ordinated to reduce any cumulative construction impacts. The Proposal is unlikely to have any significant adverse long-term impacts.	Minor
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The Proposal would not affect or be affected by any coastal processes or hazards.	Nil