



Transport Access Program

Blackheath Station Upgrade

Review of Environmental Factors



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

Blackheath Station Upgrade Review of Environmental Factors

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Abbreviations

Term	Meaning
AHIMS	Aboriginal Heritage Information Management System
AS	Australian Standard
BC Act	<i>Biodiversity Conservation Act 2016 (NSW)</i>
Blue Mountains LEP	<i>Blue Mountains Local Environmental Plan 2015</i>
CCTV	Closed Circuit TV
CEMP	Construction Environmental Management Plan
CLM Act	<i>Contaminated Land Management Act 1997 (NSW)</i>
CNVMP	Construction Noise and Vibration Management Plan
CPTED	Crime Prevention Through Environmental Design
DAWE	Department of Agriculture, Water and the Environment (Cwlth)
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
DDA	<i>Disability Discrimination Act 1992 (Cwlth)</i>
DP&E	NSW Department of Planning and Environment
DSAPT	<i>Disability Standards for Accessible Public Transport (2002 (Cwlth)</i>
EPA	NSW Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000 (NSW)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
EPL	Environment Protection License
ESD	Ecologically Sustainable Development
FM Act	<i>Fisheries Management Act</i>
Heritage Act	<i>Heritage Act 1977 (NSW)</i>
Infrastructure SEPP	<i>State Environmental Planning Policy (Infrastructure) 2007 (NSW)</i>
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service

Term	Meaning
LV	Low Voltage
NES	National Environmental Significance (refers to matters of National Environmental Significance under the EPBC Act)
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
NSW	New South Wales
PA	Public Address system
POEO Act	<i>Protection of the Environment Operations Act 1997 (NSW)</i>
RailCorp	(former) Rail Corporation of NSW
REF	Review of Environmental Factors (this document)
Roads Act	<i>Roads Act 1993 (NSW)</i>
Roads and Maritime	NSW Roads and Maritime Services (formerly Roads and Traffic Authority), now a division within Transport for NSW
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
SoHI	Statement of Heritage Impact
TAHE	Transport Asset Holding Entity of NSW
TfNSW	Transport for NSW
TGSI	Tactile Ground Surface Indicators (“tactiles”)
TMP	Traffic Management Plan
TPZ	Tree Protection Zone
UDLP	Urban Design and Landscaping Plan
WARR	<i>Waste Avoidance and Resource Recovery Act 2001 (NSW)</i>
WM Act	<i>Water Management Act 2000 (NSW)</i>

Definitions

Term	Meaning
Asset Management Branch	The Asset Management Branch (formerly Asset Standards Authority – ASA) is part of Transport for NSW, and responsible for engineering governance, assurance of design safety, and ensuring the integrity of transport and infrastructure assets. Within the rail environment, Design Authority functions formerly performed by ASA are now exercised by the Asset Management Branch.
Average Recurrence Interval	The likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100-years.
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
Design and Construct Contract	A method to deliver a project in which the design and construction services are contracted by a single entity known as the Contractor. The Contractor completes the project by refining the concept design presented in the REF and completing the detailed design so that it is suitable for construction (subject to Transport for NSW acceptance). The Contractor is therefore responsible for all work on the project, both design and construction.
Detailed design	Detailed design broadly refers to the process that the Contractor undertakes (should the Proposal proceed) to refine the concept design to a design suitable for construction (subject to Transport for NSW acceptance).
Determining Authority	A Minister or public authority on whose behalf an activity is to be carried out or public authority whose approval is required to carry out an activity (under Division 5.1 of the EP&A Act).
Disability Standards for Accessible Public Transport 2002	The Commonwealth <i>Disability Standards for Accessible Public Transport 2002</i> (“Transport Standards”) (as amended) are a set of legally enforceable standards, authorised under the Commonwealth <i>Disability Discrimination Act 1992</i> (DDA) for the purpose of removing discrimination ‘as far as possible’ against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Ecologically Sustainable Development	As defined by clause 7(4) Schedule 2 of the EP&A Regulation. Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.
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.

Term	Meaning
Noise Management Level	The Noise Management Level (NML) as defined as the EPA's Interim Construction Noise Guideline. To be measured and assessed at the property boundary that is most exposed to construction noise, and at a height of 1.5 metres above ground level. If the residential property boundary is more than 30 metres from the residence, the location for measuring or predicting noise levels is at the most affected point within 30 metres of the residence.
Noise sensitive receiver	In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (e.g. schools, TAFE colleges), health care facilities (e.g. nursing homes, hospitals), recording studios and places of worship/religious facilities (e.g. churches).
NSW Trains	From 1 July 2013, NSW Trains became the new rail provider of services for regional rail customers. Also known as NSW Train Link.
Opal card	The integrated ticketing smartcard being introduced by Transport for NSW.
Out-of-hours work	Defined as work <i>outside</i> standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act – in this instance, Transport for NSW.
Rail possession / shutdown	Shutdown is the term used by railway building/maintenance contractors to indicate that they have taken possession of the track (usually a block of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Reasonable	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
Sydney Trains	From 1 July 2013, Sydney Trains replaced CityRail as the provider of metropolitan train services for Sydney.
Tactiles	Tactile tiles or Tactile Ground Surface Indicators (TGSIs) are textured ground surface indicators to assist pedestrians who are blind or visually impaired. They are found on many footpaths, stairs and train station platforms.
The Proposal	The construction and operation of the Blackheath Station Upgrade.
The proposal site	The area that would be impacted by the Proposal during construction and operation.
The study area	The proposal site and the wider area that may be indirectly impacted by the Proposal, which may vary slightly between specialist studies.
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 Blackheath Station. This Proposal is being delivered as part of the Transport Access Program, a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

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

The Proposal would provide:

- provision of three new lifts, associated landings and canopies providing access to the station platforms from Station Street and the Great Western Highway station entry area
- provision of an entry plaza from the Great Western Highway including a new ramp and stairs from the footpath to the lift landing and existing stairs
- upgrade of the existing informal kiss and ride area on the eastern side of the station, including line marking, installation of bike hoops, sheltered seating and an upgrade of the accessible path to the station entry
- provision of an accessible path from lift 2 to the station platforms
- upgrade of the accessible path from the commuter car park to lift 3, on the Station Street side
- provision of two accessible parking spaces and extension of the Station Street commuter car park and localised regraded areas of the existing commuter car park
- widening of the waiting room doors and the family accessible toilet door
- upgrades to the station power supply, including provision of a new main switch board
- provision of a new accessible water bubbler on the island platform by the station building.

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

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

Subject to approval, construction is expected to commence in mid 2022 and take around 12 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF. An overview of the Proposal is shown in Figure ES.1.

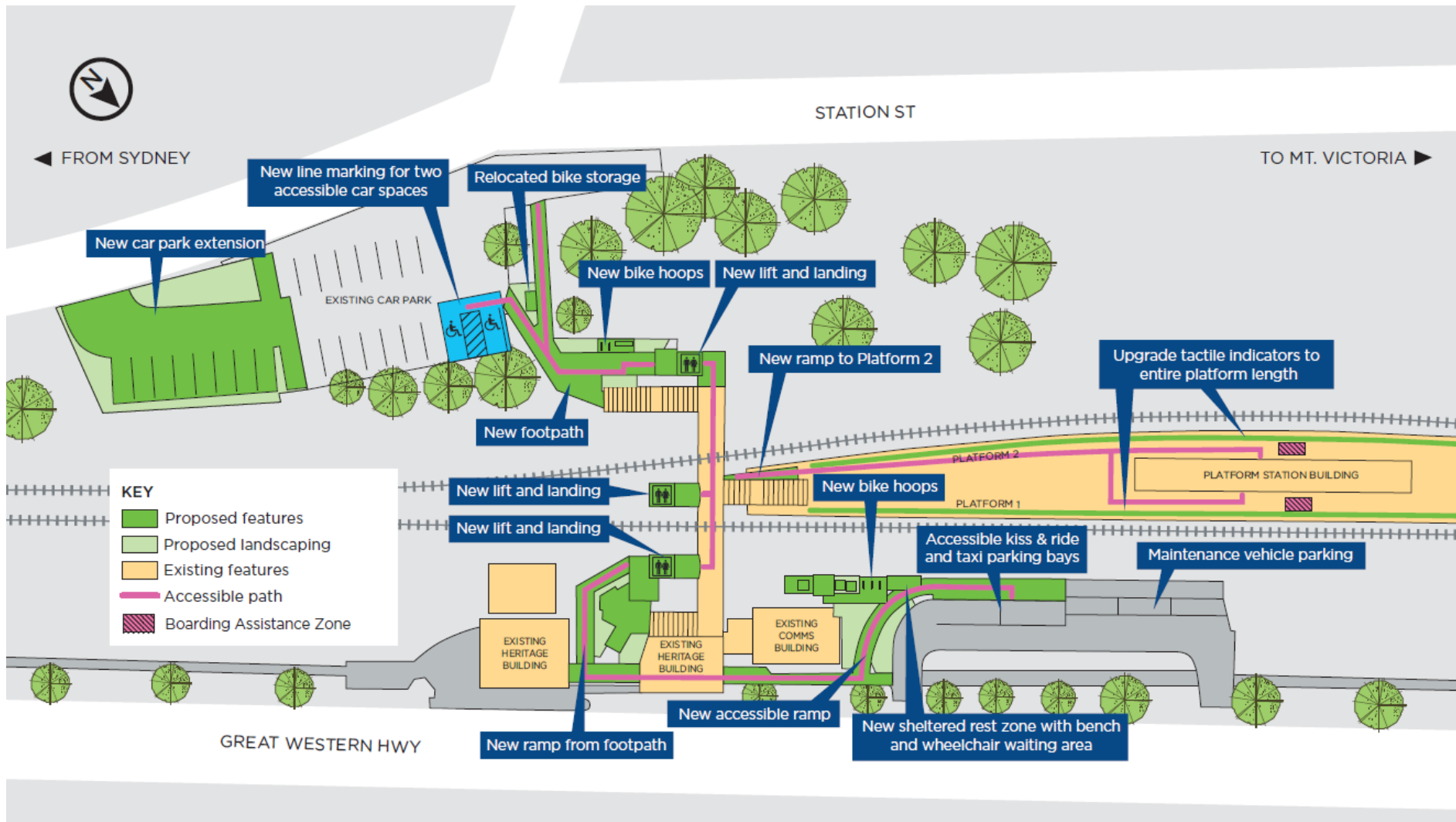


Figure ES.1 Key features of the Proposal

Need for the Proposal

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

The Proposal is designed to drive a stronger customer experience outcome, to deliver improved travel to and between modes, encourage greater public transport use and improve the connectivity between the station and the town centre. The Proposal would also assist in responding to forecasted growth in the region and as such would support growth in commercial and residential development.

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

Community and stakeholder consultation

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

During the display period a Proposal 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 Blue Mountains City Council, Sydney Trains, NSW TrainLink and Heritage NSW during the development of design options and the preferred option. Consultation with these stakeholders would continue through the detailed design and construction of the Proposal.

Feedback can be sent to:

- (a) projects@transport.nsw.gov.au
- (b) Transport Access Program – Blackheath Station Upgrade
Associate Director Environmental Impact Assessment
Transport for NSW
PO Box K659
Haymarket NSW 1240

Or submitted:

- (a) in person at the collection box within the station waiting room at Blackheath Station
- (b) via yoursay.transport.nsw.gov.au/blackheathstation

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.2 shows the planning approval and consultation process for the Proposal.

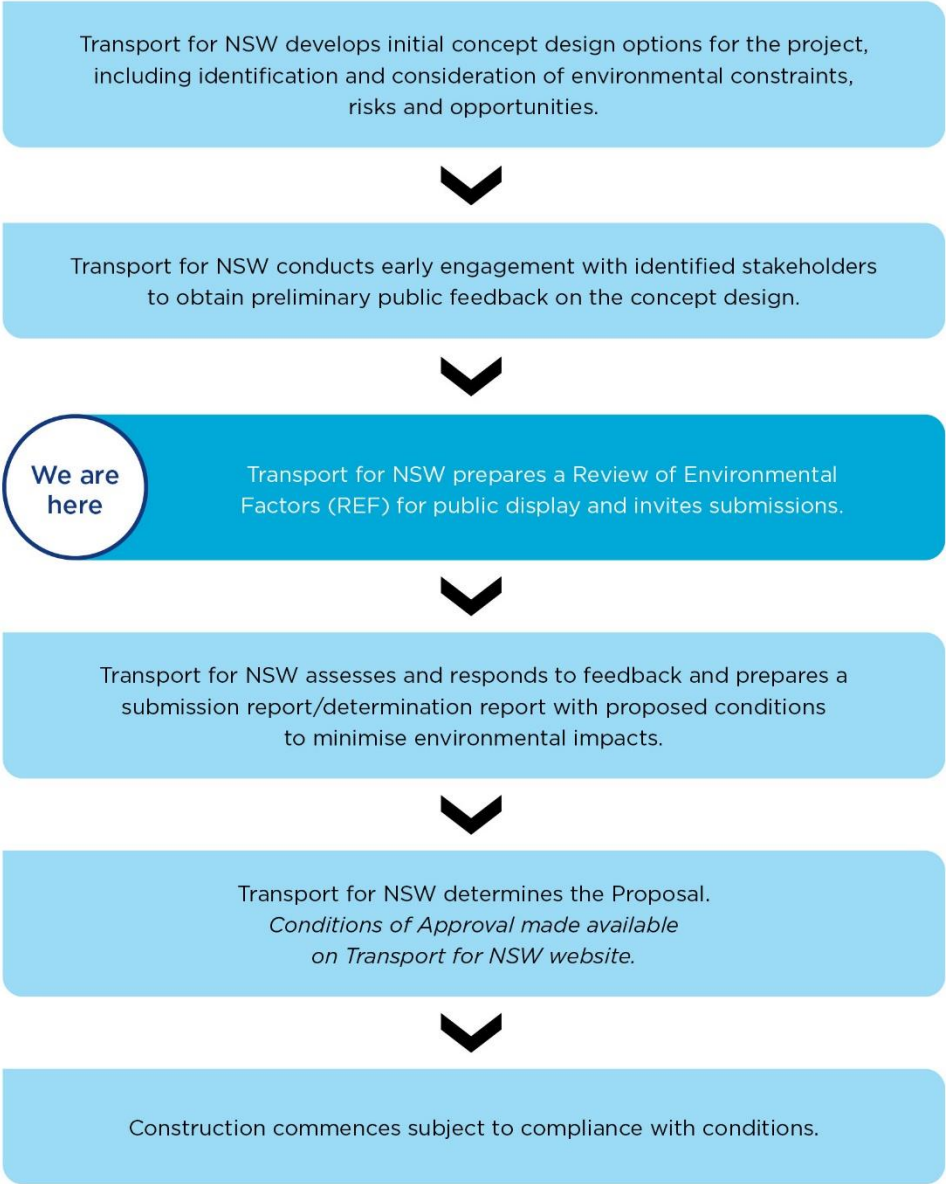


Figure ES.2 Planning approval and consultation process for the Proposal

Environmental impact assessment

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

The Proposal would provide the following benefits:

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

- improved interchange and access facilities for all customers utilising Blackheath Station.

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

- temporary adverse impacts to the visual amenity of the local environment due to the construction works associated with the Proposal
- temporary minor impacts on local traffic flow associated with construction traffic along the Great Western Highway, Bundarra Street and Station Street
- adverse impact to the local community through temporary disruptions to station facilities and amenities during construction, including potential weekend closures of Blackheath Station during scheduled Sydney Trains rail shutdowns
- temporary adverse impacts to the local community through changes to vehicular, bus and pedestrian access around the station during construction
- temporary loss of up to 20 parking spaces in the commuter car park during some construction activities resulting in station customers needing to find parking further from the station
- temporary highly affected noise impacts to adjacent residential areas during construction, including periods of weekend works
- potential sediment mobilisation, dust generation and erosion risk during construction
- removal of three exotic trees and some planting
- visual impacts to sensitive receivers during operation, including the introduction of new elements, such as lifts and ramps into the visual environment.

Further information regarding these impacts is provided in Section 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 *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2019a) 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.

Artistic representations of the Proposal are shown in Figure ES.3 and ES.4



Figure ES.3 Artist's representation of the Proposal including the Great Western Highway entry plaza and lifts, looking north-west



Figure ES.4 Artist's representation of the Proposal from the island platform, looking south

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 Blackheath Station Upgrade (the 'Proposal').

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

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

The Transport Access Program is 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.

Blackheath Station does not currently meet key requirements of the Commonwealth *Disability Standards for Accessible Public Transport 2002* (DSAPT) or the Commonwealth *Disability Discrimination Act 1992* (DDA). There is currently no compliant accessible path to the station platforms for people with reduced mobility or parents/carers with prams, no lift facilities, and some paths of travel from the surrounding footpath and roads are not compliant with requirements of the DDA. The upgrade would also include provision of improved kiss and ride, taxi zone and bicycle parking facilities.

The Proposal is required to provide safe and equitable access to the station and to improve customer facilities. The improvements would also assist in supporting growth in public transport use and would provide an improved customer experience for existing and future users of the station.

The expected increase in patronage has been taken into consideration during the design development.

1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- provision of three new lifts, associated landings and canopies providing access to the station platforms from Station Street and the Great Western Highway station entry area
- provision of an entry plaza from the Great Western Highway including a new ramp and stairs from the footpath to the lift landing and existing stairs
- upgrade of the existing informal kiss and ride area on the eastern side of the station, including line marking, installation of bike hoops, sheltered seating and an upgrade of the accessible path to the station entry
- provision of an accessible path from lift 2 to the station platforms
- upgrade of the accessible path from the commuter car park to lift 3, on the Station Street side
- provision of two accessible parking spaces and extension of the Station Street commuter car park and localised regraded areas of the existing commuter car park
- widening of the waiting room doors and the family accessible toilet door

- upgrades to the station power supply, including provision of a new main switch board
- provision of a new accessible water bubbler on the island platform by the station building.

Subject to planning approval, construction is expected to commence in mid-2022 and take around 12 months to complete.

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

1.2 Location of the Proposal

The Proposal is located at Blackheath Station, in the suburb of Blackheath, in the upper Blue Mountains, surrounded by the Blue Mountains National Park. The location of the Proposal in the regional context is shown on Figure 1.1 and Figure 1.2.

Blackheath Station is on the Blue Mountains Line, within the Blue Mountains Local Government Area (LGA), about 130 kilometres west of the Sydney central business district.

The proposal site is bounded by the rail corridor, commuter car park to the west and the Great Western Highway to the east. It has pedestrian connections to the Great Western Highway to the east and Station Street to the west.

Several cycle routes traverse the village of Blackheath including alongside the Great Western Highway corridor.

The proposal site is located on land owned by Transport Asset Holding Entity of NSW (TAHE) and managed by NSW Trains.

1.3 Existing infrastructure and land uses

Blackheath village is characterised by its inter-war period architecture and garden streetscapes. It is a popular tourist location due to the local heritage and a number of lookouts providing vistas from its ridge top location. The village is bisected by the Great Western Highway and the rail corridor which run parallel to each other, in a north-south direction.

Land uses adjacent to Blackheath Station comprise low density residential areas, general industry, public recreation and the Blackheath local centre. Retail shops, auto service and petrol station and community facilities including Blackheath library and Saint Aidan's Church are located in the vicinity of the proposal site (refer to Figure 1.2).

Blackheath Station consists of two platforms that are accessed via a footbridge. The footbridge provides pedestrian access across both tracks to the platforms on the central island (refer to Photo 1.1). Pedestrian access is provided to the Great Western Highway on the eastern side of the rail corridor and Station Street on the western side. A level crossing running from the station entrance at the Great Western Highway, also provides access to the platforms.

A signalised pedestrian crossing is provided across the Great Western Highway, adjacent to the entrance of Blackheath Station (refer to Photo 1.3). Footpaths are provided on either side of the Great Western Highway. Additionally, a narrow footpath is provided on the western side of Station Street opposite the station. Part of the path on the eastern side of the Great Western Highway provides a shared pedestrian and cycle path.

The station building was constructed in 1898 and is an example of a standard federation railway building, comprising a timber island platform building. The structure was partially reconstructed in 1985 after a fire. The single-storey timber building contains a ticket office, waiting area, a family accessible toilet, and male and female ambulant toilets. A footbridge was added in 1911 and this was upgraded with a canopy in 1990.

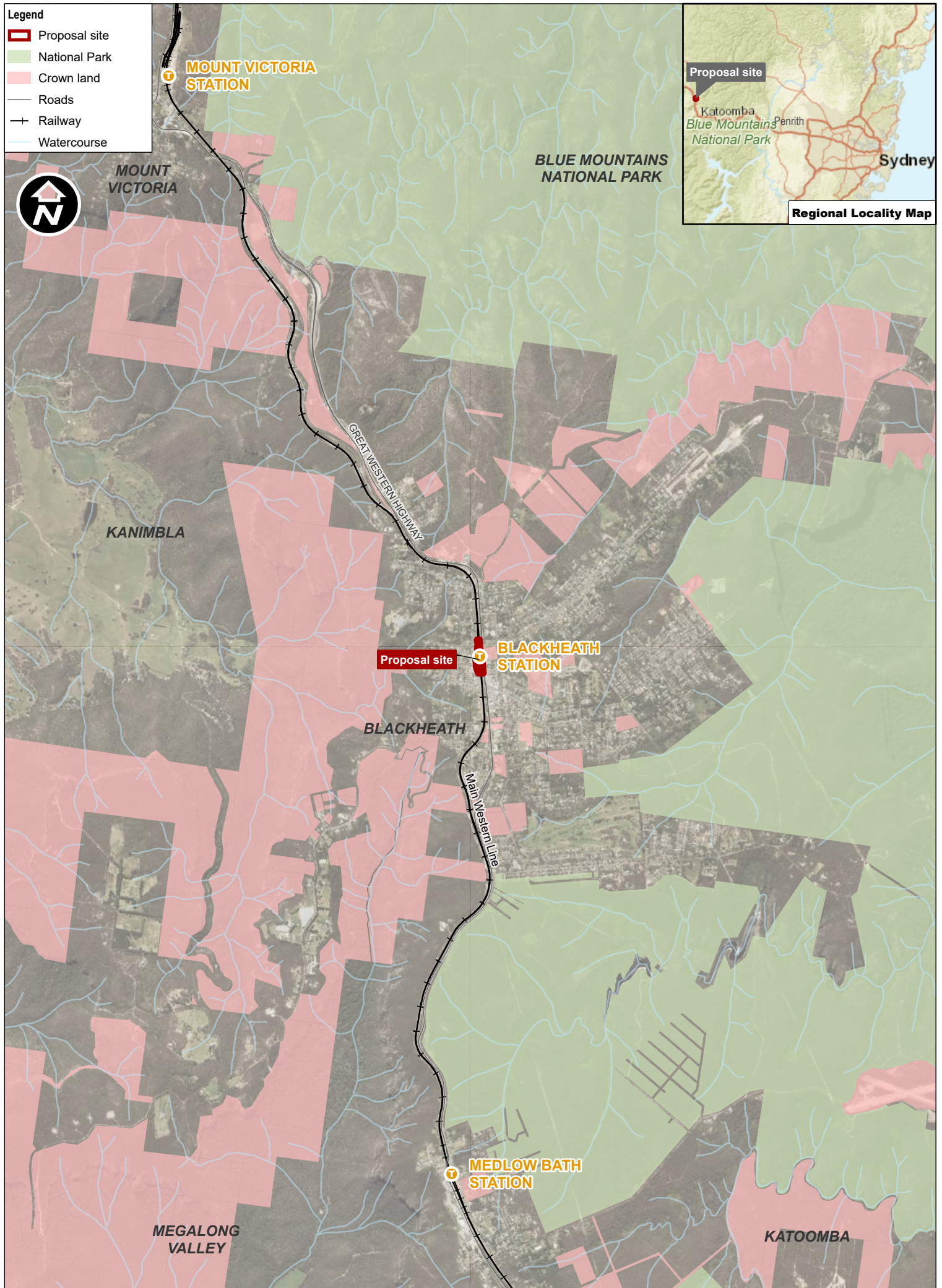
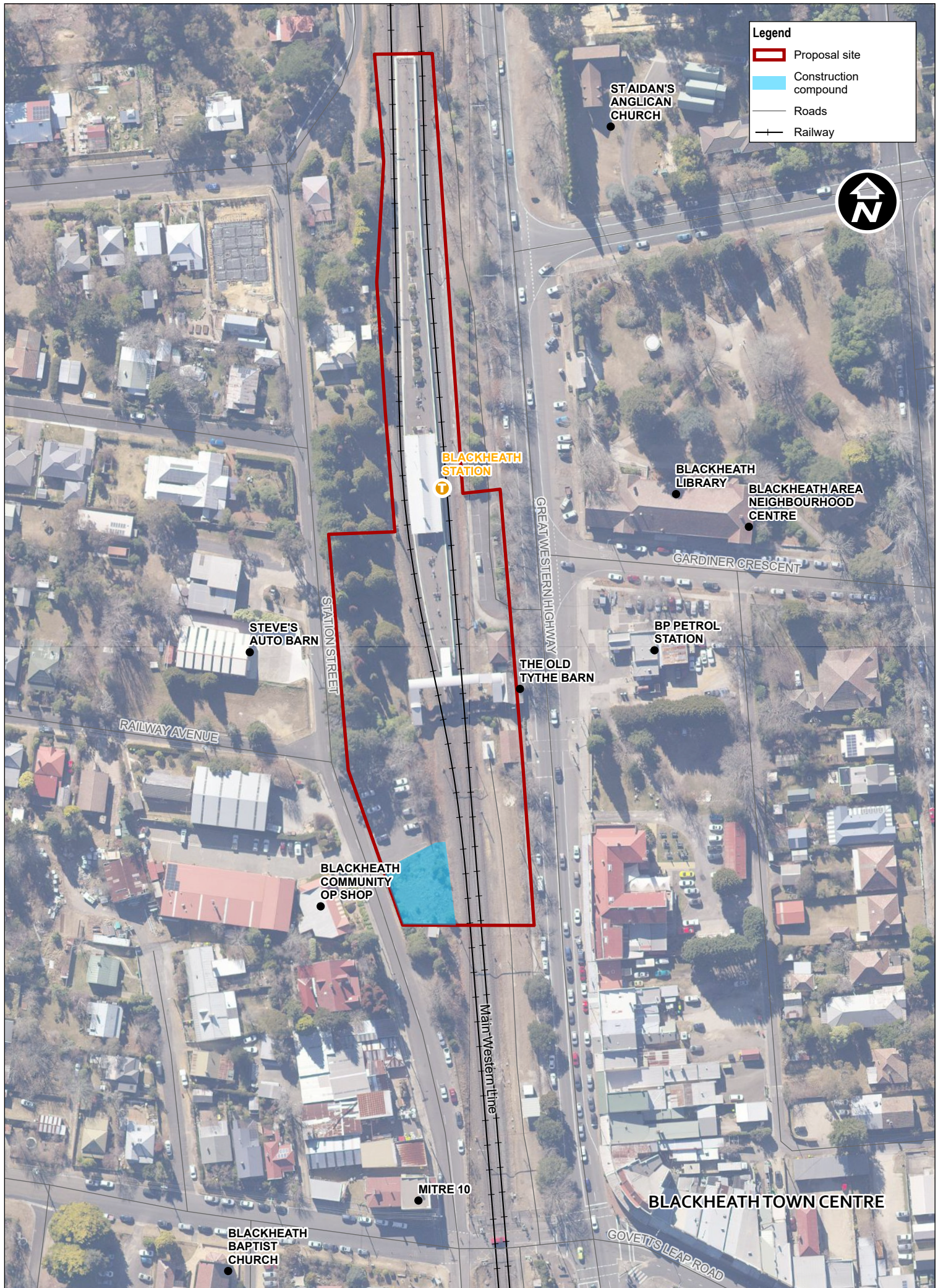


Figure 1.1 - Regional context



Legend

- Proposal site
- Construction compound
- Roads
- Railway

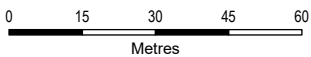


Figure 1.2 - Proposal site

Data source: NSW Imagery © Department of Customer Service 2020
 World Street Map: Esri, HERE, Garmin, NGA, USGS, NSW Department of Finance and Services, 2017; Office of Environment and Heritage NSW. Created by inroads
 \ghdrhghd\AU\Sydney\Projects\2112562533\GIS\Map\Deliverables\12562533_REF.aprx



Photo 1.1 Station building, stairs and island platform, looking north from the footbridge



Photo 1.2 Informal kiss and ride area and accessible parking spaces, looking west and north



Photo 1.3 Station entrance from the Great Western Highway showing the pedestrian crossing and stairs, viewed eastwards towards Blackheath Station

1.3.1 Interchange facilities

The Blue Mountains Line provides intercity and local connections and operates between Lithgow and the Sydney central business district via Katoomba, Springwood, Penrith, Blacktown and Parramatta. Train services typically run with:

- 15 to 20 minutes frequencies during peak weekday periods.
- 60 minute frequencies during off-peak weekday periods, weekends and public holidays.

The bus services operating near Blackheath Station include:

- 698 Katoomba to Blackheath (loop service), operates two services at the station per day (8:10am and 8:51am)
- 698V Katoomba to Mt Victoria (Loop Service), operates three services at the station per day (11:33am, 2:37pm and 4:20pm).

Bike lockers are provided near the informal kiss and ride area, on the eastern side of the station, as shown in Photo 1.4. The bicycle network in the vicinity of Blackheath Station identifies the Great Western Highway in proximity to the station as being a “hard difficulty” route, with roads to the east of the station, including Hat Hill Road and Govetts Leap Road as being “moderate difficult” routes.

A taxi zone is located on the western side of the Great Western Highway to the south of the station entrance.



Photo 1.4 Bicycle lockers at Blackheath Station

1.3.2 Car parking

A commuter car park with 20 parking spaces is provided on the western side of Blackheath Station and is accessed/egressed to/from Station Street (refer to Photo 1.5). Time-restricted parking is provided on the Great Western Highway to the south of the station providing one hour parking between 8:30am – 6:00pm Monday to Friday and 8:30am – 12:00pm Saturday.

The time-restricted parking areas support the operation of the Blackheath town centre and discourage commuters from parking on the road network near Blackheath Station.

Station Street is a local road with a single travel lane in either direction. Unrestricted on-street parking is typically available on Station Street to the south of the station.



Photo 1.5 Station Street commuter car park, looking north

A total of five parking spaces are provided within the informal kiss and ride area on the eastern side of the station, with two of these being designated as accessible parking spaces. The other three bays are signed as no parking and are used informally for kiss and ride activity. These are accessed from the Great Western Highway to the east of Blackheath Station. All movement through the informal kiss and ride area is one way in a south to north direction.

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by GHD on behalf of Transport for NSW to assess the potential impacts of the Blackheath 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 4 for more information on statutory considerations.

2 Need for the Proposal

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

2.1 Strategic justification

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

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

Table 2.1 Key NSW Government policies and strategies applicable to the Proposal

Policy / Strategy	Overview	How the Proposal aligns
Future Transport Strategy 2056 (TfNSW, 2018)	<p><i>Future Transport 2056</i> is an update of NSW's <i>Long Term Transport Master Plan</i>. It is a suite of strategies and plans for transport to provide an integrated vision for the state.</p> <p><i>Future Transport 2056</i> identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport.</p>	<p>The Proposal supports the vision of the Future Transport Strategy 2056 by providing accessible services for people who currently find it difficult to access public transport services.</p> <p>New lifts and accessible paths included in the Proposal would allow people with mobility constraints to access Blackheath Station. Greater accessibility would also mean better connections to places and opportunities for employment, education, business and leisure.</p> <p>The Proposal has also considered increased patronage in design development to accommodate the forecast Sydney Trains patronage growth and changing travel patterns. Providing further travel options away from private transport would also support environmental benefits from reduced road travel.</p>

Policy / Strategy	Overview	How the Proposal aligns
<p>Disability Inclusion Action Plan (2018-2022) (TfNSW, 2017)</p>	<p>The <i>Disability Inclusion Action Plan 2018-2022</i> 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.</p> <p>The Disability Plan identifies the challenges, the achievements to date, the considerable undertaking that is required to finish the job and provides a solid and practical foundation for future progress during the final year of its implementation.</p>	<p>The Proposal has been developed with consideration of the objectives outlined in this Plan and seeks to improve and provide equitable access to public transport facilities.</p>
<p>NSW State Infrastructure Strategy 2018-2038 (NSW Government, 2018)</p>	<p>The <i>NSW State Infrastructure Strategy 2018 – 2038</i> builds on the NSW Government's major long-term infrastructure plans over the last seven years.</p> <p>The strategy sets out the government's priorities for the 20-year period of 2018-2038, and combined with the <i>Future Transport Strategy 2056</i>, the <i>Greater Sydney Region Plan</i> and the <i>Regional Development Framework</i>, brings together infrastructure investment and land-use planning for our cities and regions.</p> <p>Public transport is viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal.</p>	<p>The Proposal supports investment in rail infrastructure and aligns with the need to continue to provide accessible public transport to support Sydney's increasing population.</p> <p>The Proposal is also consistent with overall aims and objectives of the <i>Future Transport Strategy 2056</i> to improve transport infrastructure across NSW.</p>
<p>A Metropolis of Three Cities – Greater Sydney Region Plan (Greater Sydney Commission, 2018)</p>	<p>The <i>Greater Sydney Region Plan</i> is the NSW Government's 40-year land use plan for Sydney. It establishes a vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City.</p> <p>The plan includes a number of objectives related to transport networks including:</p> <ul style="list-style-type: none"> • provision of transport infrastructure to support future growth • optimising existing infrastructure where possible. <p>The Proposal is located within the Western City District as outlined in the plan. Further discussion of the Proposal in relation to the Western City District is outlined below.</p>	<p>The Proposal would assist in meeting these objectives as it would provide a more accessible rail network which would include the availability of the network to a wider range of commuters. It would also involve the upgrade of existing infrastructure (i.e. stations) to enable them to better serve growth without the need for new investment.</p>

Policy / Strategy	Overview	How the Proposal aligns
<p>Western District Plan (Greater Sydney Commission, 2018a)</p>	<p>The <i>Western City District Plan</i> is a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year vision for Greater Sydney. It helps guide the implementation of the Greater Sydney Region Plan, A Metropolis of Three Cities, at a district level and is a bridge between regional and local planning.</p>	<p>The Proposal is located within the Western City District as part of the Blue Mountains.</p> <p>The Proposal would assist in meeting the Planning Priorities of providing services and social infrastructure to meet people’s changing needs as it would increase the accessibility of places and transport, ensuring people with disability can easily access services. The Proposal would also enhance productivity through developing a more accessible, connected and walkable city.</p> <p>Within the <i>Western District Plan</i>, Katoomba is listed as a Strategic Centre which is expected to become an increasingly important part of the region’s structure. The Proposal would also assist with the development and growth of Katoomba as a Strategic Centre due to its proximity and improved accessibility.</p>
<p>Building Momentum – State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)</p>	<p>The <i>State Infrastructure Strategy 2018-2038</i> makes recommendations for each of NSW’s key infrastructure sectors including transport.</p> <p>The strategy identifies policies and strategies for infrastructure needed to meet the demands of a growing population and economy.</p>	<p>The Proposal supports investment in rail infrastructure as identified in the strategy, improving accessibility, safety and comfort for customers. The proposal may encourage greater patronage.</p>
<p>NSW: Premier Priorities (NSW Government, 2019)</p>	<p>In June 2019, 14 new Premier’s Priorities were announced that would allow the Government to measure and deliver in areas where NSW can do better. The key policy priorities, include the following:</p> <ul style="list-style-type: none"> • a strong economy • highest quality education • well-connected communities with quality local environments • putting customer at the centre of everything we do • breaking the cycle of disadvantage. 	<p>The Proposal supports the Premier’s Priorities in the key area of ‘breaking the cycle of disadvantage’.</p> <p>The Proposal would assist in reducing the disadvantage experienced by people with a disability by providing three new lifts, improved accessible paths and new tactile ground surface indicators, line marking and stencilling at various locations.</p>

Policy / Strategy	Overview	How the Proposal aligns
<p>Integrated Transport Strategic Plan 2035 (Blue Mountains City Council, 2018)</p>	<p>The <i>Integrated Transport Strategic Plan 2035</i> was developed in 2 parts:</p> <ul style="list-style-type: none"> to provide a strategic context for Blue Mountains City Council to advocate to the NSW Government for improvement to state roads and public transport services to provide a policy framework to guide the detailed planning for the Blue Mountains' traffic and transport services, and infrastructure, and provide a strategic context to enable Blue Mountains City Council to prioritise strategies and actions. 	<p>The Proposal is consistent with the following actions related to improving public transport services within the Blue Mountains LGA:</p> <ul style="list-style-type: none"> Action 4 – upgrade to disability standards: The Proposal would involve upgrading Blackheath Station so that it is more accessible for people with a disability. Action 8 – improve commuter transport: The Proposal would result in a net increase of seven commuter parking spaces and would have the potential to encourage local community members to use trains to access their places of employment.
<p>Disability Inclusion Action Plan 2017 – 2021 (Blue Mountains City Council, 2017)</p>	<p>The <i>Disability Inclusion Action Plan 2017 – 2021</i> identified actions to ensure Council's services, facilities, programs and information are inclusive for all members of the community. Focus areas of the plan were:</p> <ul style="list-style-type: none"> liveable communities systems and processes access to meaningful employment attitudes and behaviours. 	<p>The Proposal would assist in achieving the objectives of the Disability Inclusion Action Plan, as it would make public transport facilities in the Blue Mountains LGA more accessible for people with a disability.</p>
<p>Blue Mountains Pedestrian Access & Mobility Plan 2025 (Blue Mountains City Council, 2016)</p>	<p>The <i>Blue Mountains Pedestrian Access & Mobility Plan 2025</i> is a plan which was implemented in 2016 and establishes a vision for walking. It sets integrated principles, objectives and recommendations regarding safety, education and promotional programs as well as walking related infrastructure, including a footpath network.</p>	<p>The Proposal would assist in achieving objectives one and two of Step 5: Walking and Public Transport through improving access to and within Blackheath Station. Through improving accessibility, the Proposal would also have the potential to contribute to an increase of walk-train-walk trips within the Blue Mountains LGA.</p> <p>The Proposal is also consistent with recommendation 5.1.1.</p>

Policy / Strategy	Overview	How the Proposal aligns
<p>Blue Mountains Local Strategic Planning Statement (Blue Mountains City Council, 2020)</p>	<p>The <i>Blue Mountains Local Strategic Planning Statement</i> aligns with, and responds to, the key direction of the <i>Blue Mountains Community Strategic Plan 2035</i>. It includes 9 local planning priorities and associated actions within three key themes:</p> <ul style="list-style-type: none"> • sustainability • liveability • productivity. <p>Blackheath is identified as a town centre according to the centre's hierarchy in the Blue Mountains Structure Plan. According to the 20-year vision, key town centres would be enhanced and revitalised, to provide greater housing choice, walkability and connection for the local community. The <i>Blue Mountains Local Strategic Planning Statement</i> envisions improving local transport connections and accessibility, including walking and cycling.</p>	<p>The Proposal would assist in achieving Action 9.13 as it would make public transport in the Blue Mountains LGA more accessible and improve mobility for transport users. The Proposal would also assist in achieving Action 9.14 by providing a net increase of seven commuter parking spaces.</p>

2.2 Objectives of the Transport Access Program

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

- stations that are accessible for those with disabilities, the 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

The specific objectives of the Blackheath Station Upgrade are to:

- provide a station that is accessible for those with disabilities, limited mobility, parents/carers with prams and customers with luggage
- improve customer experience by improving accessibility, weather protection, interchange facilities and visual appearance

- reduce pedestrian conflict and crowding points
- improve integration with the surrounding precinct
- improve customer safety
- improve wayfinding in and around the station
- respond to the heritage values of the site
- improve customer amenity
- maintain/create cross corridor access/pedestrian links across the rail corridor and the Great Western Highway.

2.4 Design development

In 2018, Stantec was engaged to prepare a Scoping Design Report (Stantec, 2018). The report identified the following key access constraints and issues at Blackheath Station:

- access to Blackheath Station platforms is only provided via stairs from the footbridge and a pedestrian level crossing that is non-compliant with DSAPT
- the path from the existing accessible car spaces in the informal kiss and ride area to footbridge and level crossing is non-compliant with DSAPT
- clear vistas and sight lines from the highway should be maintained where possible
- close proximity of existing footbridge to station building
- accessible parking spaces are not provided in Station Street commuter car park
- non-compliant hand railing and nosing on existing platform stairs
- tactile indicators on existing stairs and platform edge do not comply with required standards.

2.5 Alternative options considered

Options for improving the access to, and amenity of, Blackheath Station were developed following a succession of workshops with Transport for NSW, relevant stakeholders and the Proposal design team.

Three concept design options were developed to address accessibility and customer experience needs, potential heritage impacts and other design principles.

Option 1

This option would provide three lifts onto the southern side of the existing footbridge (refer to Figure 2.1). A new accessible ramp would be provided at the Great Western Highway entry to the lift at the side of the existing stair. The existing level crossing to the platform would be removed. The lift at the platform would require a new ramp and walkway to access the platform. The lift on the commuter car park side would require a new accessible walkway.

New line marking would be needed at the existing Station Street commuter car park to provide two accessible car parking spaces. New line marking for the existing accessible parking and informal kiss and ride bays along the Great Western Highway. The footpath along the Great Western Highway to the kiss and ride bays would need to be regraded to have a maximum fall of 1:40. There would be a seat and accessible waiting area provided for customers at the kiss and ride bays.

All stairs would be upgraded with new compliant handrail, tactiles and stair nosings. At the station building, doors would need to be adjusted to achieve a compliant clear width to the waiting room and to the existing family accessible toilet.



Figure 2.1 Artistic representation of Option 1

Option 2

Option 2 provides all the same features as Option 1.

In addition, Option 2 would also include a new accessible path from the kiss and ride bays to the location of the new lift 1. The location of this path is shown in Figure 2.2.



Figure 2.2 Artistic representation of Option 2 accessible path

Option 3

This option looks at providing a new footbridge, lifts and stair, as shown in Figure 2.3. This would require removal of the existing footbridge and level crossing. The new footbridge would be located closer to the existing station building to comply with design standards of setbacks and clearances. This option has greater visual impacts on the station building, which is known for its heritage values. This option also has a more dominant presence when compared to other options. The three lifts would be located on the southern side of the new footbridge. The stair on the platform and the Great Western Highway side would face north and the stair on Station Street side would face south.

Line marking for accessible car parking spaces and kiss and ride bays, regrading of the footpath and provision of a seat at the kiss and ride bays are the same as Options 1 and 2.

Adjustment of the doors to the waiting rooms and family accessible toilet are the same as Options 1 and 2.



Figure 2.3 Artistic representation of Option 3 new footbridge, lifts and stairs

2.5.1 The 'do-nothing' option

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

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

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

2.5.2 Assessment of identified options

All three options were assessed in 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. A summary of the assessment outcomes is provided in Table 2.2.

Table 2.2 Assessment of options

Design principles	Option 1	Options 2	Options 3
Value for money	Selection of materials that are low maintenance and durable. Yet not compromising the architectural quality.	Selection of materials that are low maintenance and durable. Yet not compromising the architectural quality.	New footbridge construction with materials that are low maintenance and durable.
	The existing footbridge would be refurbished, repaired and maintained as part of the works.	The existing footbridge would be refurbished, repaired and maintained as part of the works.	Highest capital costs.
Pedestrian permeability and connectivity	Existing footbridge provides connections and is being retained.	Existing footbridge provides connections and is being retained.	New footbridge maintains cross corridor.
Integrate the Proposal with the local context	Existing footbridge is being maintained therefore no change to local context.	Existing footbridge is being maintained therefore no change to local context.	Removing existing footbridge and constructing new footbridge closer to station building. This would disrupt existing vegetation in park and have greater visual impact to built form.
Maximise the amenity of the public domain	Upgrading new works to provide safer facilities. Better accessibility connections.	Upgrading new works to provide safer facilities. Better accessibility connections.	Upgrading new works to provide safer facilities. Better accessibility connections.
Protect and enhance heritage features and trees	Some works next to heritage buildings. No disruption to existing vegetation.	Some works next to heritage buildings. No disruption to existing vegetation.	Greater impact on existing vegetation. Removal of existing footbridge. New footbridge closer to station building.
Maximise view opportunities	No change from existing.	No change from existing.	Some improved view opportunities due to increased height of new footbridge.
Customer and community focussed	Design provides safer access.	Design provides safer access.	Design provides safe access. Greater disruption to customers during construction.

Source: Stantec, 2018.

2.6 Justification for the preferred option

Based on the multi-criteria analysis, the preferred design option for Blackheath Station was determined to be Option 1 which performed better in all categories with fewer impacts compared to Options 2 and 3.

Option 2 was similar to Option 1, however an assessment of the additional new accessible path from the existing parking, was identified as having safety issues and was therefore discounted.

Option 3 was considered to be the least preferred option due to the constraints associated with longer construction period, disruptions to station operations, major visual and heritage impacts and higher capital costs when compared to the other two options.

Option 1 was therefore selected as the preferred option.

Further design development included:

- selection of the materials, colours and finishes of the new lift structures. Five designs were considered, an assessment of the visual and heritage impacts of these options has been summarised in the Statement of Heritage Impact Report (Extent Heritage, 2022)
- relocation of accessible parking to the Station Street commuter car park. This determines that provision of all untimed commuter parking is equitable and meets accessibility requirements in that accessible parking must be provided where parking is provided
- extension of Station Street commuter car park to provide additional car spaces based on community feedback provided in 2019 early engagement.

The delivery of the Proposal would provide a stronger customer experience outcome, to deliver improved travel to and between modes, encourage greater public transport use and better integrate interchanges with the role and function of town centres.

A description of the Proposal (Option 1 including design refinements) is presented in Chapter 3.

3 Proposal description

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

3.1 The Proposal

As described in Section 1.1, the Proposal involves an accessibility upgrade of Blackheath Station as part of the Transport Access Program which would improve accessibility and amenities for customers. Accessible features would be compliant with the *Disability Standards for Accessible Public Transport* (DSAPT) or the *Commonwealth Disability Discrimination Act 1992* (DDA).

The Proposal would include the following key elements:

- provision of three new lifts, associated landings and canopies providing access to the station platforms from Station Street and the Great Western Highway station entry area
- provision of an entry plaza from the Great Western Highway including a new ramp and stairs from the footpath to the lift landing and existing stairs
- upgrade of the existing informal kiss and ride area on the eastern side of the station, including line marking, installation of bike hoops, sheltered seating and an upgrade of the accessible path to the station entry
- provision of an accessible path from lift 2 to the station platforms
- upgrade of the accessible path from the commuter car park to lift 3, on the Station Street side
- provision of two accessible parking spaces and extension of the Station Street commuter car park and localised regraded areas of the existing commuter car park
- widening of the waiting room doors and the family accessible toilet door
- upgrades to the station power supply, including provision of a new main switch board
- provision of a new accessible water bubbler on the island platform by the station building.

Figure 3.1 shows the key elements of the Proposal. Artistic representations of the design are provided in Figure 3.2, Figure 3.3 and Figure 3.4.

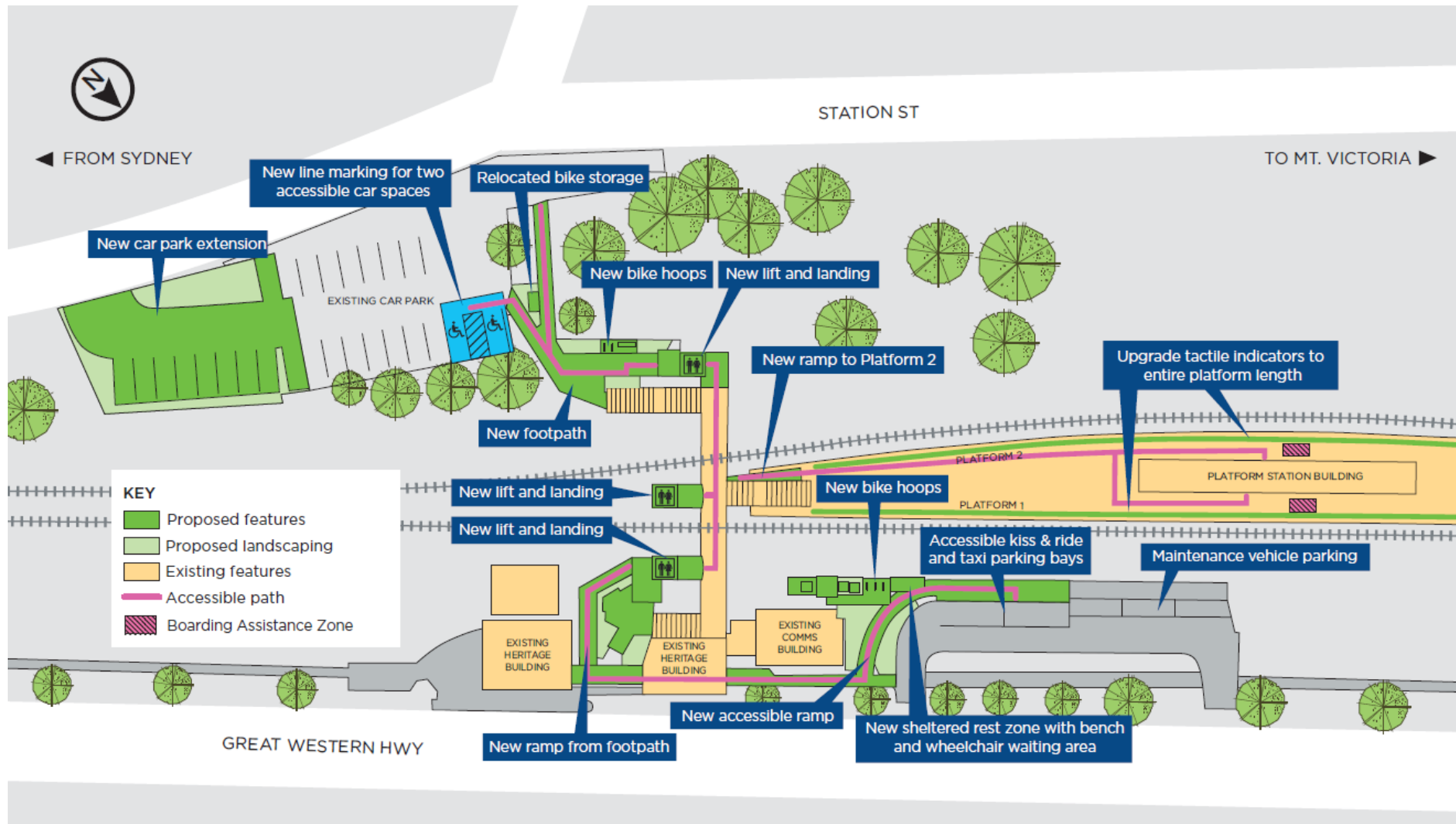


Figure 3.1 Key features of the Proposal



Figure 3.2 Artist's representation of the Proposal including the Great Western Highway entry plaza and lifts, looking north-west.

(Indicative only, subject to detailed design)



Figure 3.3 Artist's representation of the Proposal from the island platform, looking south.

(Indicative only, subject to detailed design)



Figure 3.4 Artist's representation of the Proposal from above, looking north-east.

(Indicative only, subject to detailed design)

3.2 Scope of work

3.2.1 Station upgrade

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

- installation of three new 17 person lifts with lift landings, canopies and protection/safety screens between:
 - the Great Western Highway entry and the existing footbridge
 - the Station Street entry and the existing footbridge
 - the existing footbridge and the island platform
- upgrade of the ramp to connect lift 2 to the island platform
- modification to the existing footbridge to accommodate the new lift landings
- provision of boarding assistance zones, markings and allocated waiting spaces on each platform
- provision of a new accessible water bubbler and retention of the existing heritage listed water bubbler
- provision of new hearing loops (audio frequency induction loops) in the platform waiting areas
- decommission and removal of the existing pedestrian level crossing
- resurface the full island platform, and regrade the platform to achieve an accessible path to the new lift, existing stairs, boarding assistance zones, family accessible toilet, waiting room and other customer facilities in the station
- installation of new tactile ground surface indicators, line marking and stencilling for the full island platform
- installation of directional tactile ground surface indicators from stairs and ramp through to the island platform warning tactile ground surface indicators
- installation of new tactile ground surface indicators, stair nosing and handrails to the existing footbridge and stairs.

3.2.2 Station building modifications

Modification of the station building waiting room would include the following:

- provision of widened doorways from Platform 1 and Platform 2 into the waiting room to achieve a compliant clear width
- provision of a widened family accessible toilet door to achieve a compliant clear width
- installation of armrests to waiting room seating
- relocation of existing phone booth to improve accessibility.

3.2.3 Interchange and car park facilities

Improvements and upgrades to the car park facilities would include:

- upgrade of the existing parking spaces on the Great Western Highway to provide one accessible kiss and ride bay and one accessible taxi space. The existing Sydney Trains' maintenance vehicle parking zone would be retained

- upgrade of the station entrance off the Great Western Highway to provide accessible paths between the new lift, existing stairs and the upgraded kiss and ride bay and taxi zone, and the pedestrian crossing of the Great Western Highway outside the station entry
- provision of sheltered seating near the upgraded kiss and ride bay, including an allocated waiting space
- extension of the existing Station Street commuter car park to increase the number of parking spaces from 20 spaces to 28 - 30 spaces. The accessible parking currently provided on the Great Western Highway would be relocated to the Station Street commuter car park, providing two compliant accessible parking spaces
- upgrade of the Station Street entrance to provide accessible paths between the new lift and existing stairs and the new accessible parking spaces in the commuter car park
- relocation of the existing bicycle lockers from the Great Western Highway near to the Station Street commuter car park, and provision of at least five new bike hoops at the station.

3.2.4 Ancillary work

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

- relocation and/or adjustment of existing help and information points
- relocation or replacement of existing customer facilities (such as platform seating, bins, telephone booth, Opal card readers, help points, information points, and fencing etc.)
- improvement to station systems (including additional CCTV cameras, Public Address (PA) system and hearing loops) and wayfinding signage.
- electrical upgrade works including installation of distribution boards as required to accommodate the Proposal
- lighting adjustments
- provision of landscaping/planting within the station precinct.

3.2.5 Materials and finishes

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

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

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

- lift shafts – concrete, treated aluminium cladding and glass. Lifts 1 and 2 would be precast, lift 3 would be constructed on-site.
- lift landings – stainless steel handrail, painted steel canopy and glass
- accessible paths and platform – concrete and asphalt with stainless steel handrails

- upgraded stairs – replacement of stainless steel handrails, tactile ground surface indicators and stair nosings on existing stairs
- car park extension – asphalt.

The design of the station upgrade would be sympathetic to the existing environment, taking into consideration the character of the station. Selection of materials and finishes would be confirmed as part of the detailed design process.

The design has been submitted to Transport for NSW's Design Review Panel for comment before being accepted by Transport for NSW. An Urban Design and Landscaping Plan (UDLP) 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 constraints

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

Existing structures: the placement, structural integrity and condition of existing structures needed to be considered during the development of the design. These structures included the station footbridge, station entry areas, station buildings, structures for wiring and signals, and pavements.

Sydney Trains' requirements: modifications for existing structures and new structures within the rail corridor must be designed and constructed with consideration of train impact loads, structural clearances to the track, and safe working provisions.

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

- station lighting
- low voltage within the station platform, and station entry areas (underground)
- car park lighting
- overhead wiring
- train signals (underground)
- telecommunication services (underground)
- stormwater and water services.

Heritage: The station building was constructed in 1898 and Blackheath Station is listed on the State Heritage Register as part of the *Blackheath Railway Station Group*.

3.3.2 Design standards

The Proposal would be designed with regards to the following:

- Disability Standards for Accessible Public Transport 2002 (issued under the *Commonwealth Disability Discrimination Act 1992*)
- Building Code of Australia
- relevant Australian Standards
- Transport for NSW Asset Management Branch standards
- Sydney Trains standards

- NSW Sustainable Design Guidelines – Version 4.0 (TfNSW, 2019a)
- 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
- Blue Mountains City Council standards, where relevant.

3.3.3 Sustainability in design

The development of the concept design for the Proposal has been undertaken in accordance with the Proposal targets identified in Transport for NSW's Environmental Management System (EMS) and the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2019a) which groups sustainability into seven themes:

- energy and greenhouse gases
- climate resilience
- materials and waste
- biodiversity and heritage
- water
- pollution control
- community benefit.

There are 14 compulsory requirements and two sub requirements that project teams are required to implement when there is confirmation that these individual initiatives are applicable to the project. Each compulsory requirement has an associated list of supporting initiatives.

These compulsory requirements have been reviewed and would be incorporated into the Sustainability Management Plan and provided to the Contractor. The checklist and the requirements contained within would be reviewed again at the detailed design and construction phases, and submitted for approval by Transport for NSW.

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

3.4 Construction activities

3.4.1 Work methodology

Subject to approval, construction is expected to commence mid 2022 and take around 12 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with Transport for NSW.

The construction activities for the Proposal are identified in Table 3.1. This staging is indicative and is based on the current concept design and may change once the detailed design methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work.

Rail possessions for track maintenance occur around three times per year over the weekend, at Blackheath. Buses replace trains and the rail line is shut down for maintenance and construction activities to occur. Works during these weekends usually commence early on Saturday morning, and normal train services resume on Monday morning.

Table 3.1 Indicative construction staging for key activities

Stage	Activities
Site establishment and enabling work	<ul style="list-style-type: none"> • site investigations and survey • establishment of site compound (erect fencing, tree protection zones, site offices, amenities and plant/material storage areas) • relocation of services • installation of temporary services • installation of temporary fencing and hoarding as required • traffic control measures.
Rail possession 1	<ul style="list-style-type: none"> • decommission and removal of pedestrian level crossing • removal of the existing ramp between the level crossing and platform • installation of hoarding from the level crossing area to the platform • piling for new lift and ramp footings • excavation of the platform for the combined service route. <p>Note: the Station, footbridge and commuter carpark would be closed to customers during these works.</p>
Lift 3 and platform building works	<ul style="list-style-type: none"> • family accessible toilet and waiting room door widening works (temporary closures of each space would be required) • lift piling • lift pit excavation • concrete works to lift pit (concrete pour in situ) and waterproofing • installation of scaffold and completion of concrete works (in situ) up to footbridge level, support beams for new landing area • preassembly of lift steel structure (commuter car park spaces may be temporarily occupied).
Rail possession 2	<ul style="list-style-type: none"> • platform resurfacing (new asphalt) to half the platform area • excavation of lift pits (lifts 1 and 2) • install lift pit shoring boxes (precast concrete) • footbridge modification works to allow for lift 3 landing • installation of lift 3 steel structure (crane) • platform combined service route works • water bubbler in ground plumbing works. <p>Note: the Station, footbridge and commuter carpark would be closed to customers during these works.</p>

Stage	Activities
Precast lift 1 and 2 components and station entry civil works	<ul style="list-style-type: none"> • installation of new platform tactiles (to the platform area that was resurfaced during Possession 2) • lift 1 and 2 detailed excavation works • lift 1 and 2 precast assembly works in car park (car park temporarily closed) • preassemble lift 1 and 2 steel structures in car park (car park temporarily closed) • lift 3 landing balustrade works incl. roofing and anti-throw screens install • lift 3 installation • Civil and landscaping works to the station entry areas, (changes to pedestrian access around the station would be in place with paths sign posted) • service works in platform and station entries as required (drainage, LV, CCTV, Lighting etc.).
Rail possession period 3	<p>Platform works:</p> <ul style="list-style-type: none"> • changes to platform hoardings • platform resurfacing works (to the remaining half of the platform) • crane setup and lifting of precast and structural steel lift components into place • install new ramp (between lift and platform) precast slabs, steelworks, balustrades and anti-throw screens • erection of all lift 1 and 2 precast sections and steel components • lift 1 and 2 roofing works • minor footbridge modification works to allow for new lift landings • bridge stair nosing and handrail modification works • civil works to station entries (final stage). • installation supply main switch board and services commissioning works <p>Note: the Station, footbridge and commuter car park would be closed to customers during these works.</p>
Lift 1 & 2 installation, platform, signage and finishing works	<ul style="list-style-type: none"> • complete platform ramp works • install platform tactiles (to the platform area that was resurfaced during Possession 3) • install wayfinding signage site-wide • lifts 1 & 2 installation • install new accessible water bubbler • relocate platform furniture • installation supply main switch board containment • Station Street car park line marking works (commuter car park would be temporarily closed during these works).
Demobilisation	<ul style="list-style-type: none"> • install ancillary features and landscaping • removal of footpath/pedestrian management and traffic controls • removal of construction fencing/hoarding and environmental control measures • removal of temporary site facilities • asphalt & line marking works to extend the Station Street car park • completion of site clean-up and tidying works.

3.4.2 Plant and equipment

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

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

3.4.3 Working hours

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

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

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

Out-of-hours work is required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to ensure the safety of railway workers and operational assets. It is estimated that approximately three rail possessions would be required to facilitate the following:

- removal of pedestrian level crossing
- completion of pavement and platform structures and resurfacing works
- installation of lifts
- works impacting access to footbridge and 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's *Construction Noise and Vibration Strategy* (TfNSW, 2019b) (refer to Section 6.3 for further details).

3.4.4 Earthworks

Excavations and earthworks would be required for the following:

- the construction of three new lift pits, which would require excavation into the existing soil/fill at these locations
- construction of the new ramp, station entries, paths to the commuter car park, and work within the car park areas including the upgrade of the accessible car spaces, kiss and ride bays, taxi zone and any associated work
- other minor civil works such as the footings and foundations for structures and trenching activities for service adjustments and relocations.

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

Specific locations for spoil placement would be agreed with Transport for NSW and the Contractor during the delivery phase.

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 *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2019a). 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:

- impacts to pedestrians, rail customers and cyclists, including temporary detours to pedestrian access from the station to car park
- impact to pedestrian and cyclist movements on both sides of the station due to the movement of construction material and the location of cranes during construction
- increased vehicle movements
- temporary disruption to access to the car parks and spaces during work
- temporary loss of parking spaces due to the precast concrete and steel preassembly area and the crane setup area.

3.4.7 Ancillary facilities

A temporary construction compound would be required to accommodate a site office, amenities, laydown, and storage area for materials.

The area that has been nominated for the construction compound is shown on Figure 1.2. Table 3.2 provides details on the existing status and ownership of the site. Impacts associated with using this area has been considered in the environmental impact assessment including requirements for site restoration and rehabilitation.

Table 3.2 Compound site locations

Location	Existing use	Access point	Ownership
Southern end of proposal site next to existing commuter car park, Station Street, Lot 103 DP1167899	Vacant land	Station Street	TAHE

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 likely some services may require relocation, including low voltage power lines and lighting, but such relocation is unlikely to occur outside of the footprint of the work assessed in this REF. If work would be required outside of this footprint, further assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase.

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 new station, interchange and car park facilities is subject to further discussions with NSW Trains, Sydney Trains, Transport for NSW and Blue Mountains City Council. Structures constructed under this Proposal would be operated by NSW Trains and maintained by Sydney Trains. However, it is expected that the commuter car park, and Great Western Highway footpath areas would continue to be maintained by Blue Mountains City Council.

4 Statutory considerations

Chapter 3 provides a summary of the statutory considerations relating to the Proposal including a consideration of NSW Government policies/strategies, NSW legislation (particularly the EP&A Act), environmental planning instruments, and Commonwealth legislation.

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The (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. This includes designated World Heritage Areas such as the Greater Blue Mountains Area. The Proposal is located about two kilometres from the Greater Blue Mountains Area and would not result in direct impacts to this area. Given the separation distance between the Proposal and the boundary of the World Heritage Area, indirect impacts are also considered unlikely. All matters of NES 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, including World Heritage Areas, or on Commonwealth land, a referral to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) is not required.

4.1.2 Other Commonwealth legislation

Other Commonwealth legislation applicable to the Proposal is discussed in Table 4.1.

Table 4.1 Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</i>	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 to Section 6.5). However, considerations for unexpected finds further detailed in mitigation measures and applies to this Act.
<i>Disability Discrimination Act 1992 (DDA)</i>	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 Blackheath Station which is consistent with the objectives of this Act.

4.2 NSW legislation and regulations

4.2.1 Transport Administration Act 1988

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

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

2A Objects of Act

...

- a) *to provide an efficient and accountable framework for the governance of the delivery of transport services,*
- b) *to promote the integration of the transport system,*
- c) *to enable effective planning and delivery of transport infrastructure and services,*
- d) *to facilitate the mobilisation and prioritisation of key resources across the transport sector,*
- e) *to co-ordinate the activities of those engaged in the delivery of transport services,*
- f) *to maintain independent regulatory arrangements for securing the safety of transport services.*

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

...

- (a) **Environmental sustainability**
To promote the delivery of transport services in an environmentally sustainable manner.
- (b) **Social benefits**
To contribute to the delivery of social benefits for customers, including greater inclusiveness, accessibility and quality of life.

4.2.2 Environmental Planning and Assessment Act 1979

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

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

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

4.2.3 Other NSW legislation and regulations

Table 4.2 provides a list of other relevant legislation applicable to the Proposal.

Table 4.2 Other legislation applicable to the Proposal

Applicable legislation	Considerations
<i>Biodiversity Conservation Act 2016</i> (BC Act) (NSW)	<p>A biodiversity assessment is required if impacts of an activity or development (as defined by the EP&A Act) on threatened species or ecological communities listed by the BC Act, or their habitats, are likely to be 'significant' as determined by the test in Section 7.3 of the BC Act (the 'five-part test').</p> <p>The proposal site does not contain suitable habitat for any listed threatened species, population or ecological community and is unlikely to have a significant impact on any threatened species, population or ecological community (refer to Section 6.7).</p>
<i>Biosecurity Act 2015</i> (Biosecurity Act) (NSW)	<p>Clause 22 of the Biosecurity Act 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.</p> <p>Appropriate management methods would be implemented during construction if declared priority weeds in the Blue Mountains LGA are identified (refer to Section 6.7).</p>
<i>Contaminated Land Management Act 1997</i> (CLM Act) (NSW)	<p>Section 60 of the CLM Act imposes a duty on landowners to notify the NSW Department of Planning and Environment and potentially investigate and remediate land if contamination is above EPA guideline levels.</p> <p>The proposal site has not been declared under the CLM Act as being significantly contaminated (refer to Section 6).</p>
<i>Crown Lands Act 1987</i> (NSW)	<p>The Proposal does not involve work on any Crown land.</p>
<i>Heritage Act 1977</i> (Heritage Act) (NSW)	<p>The key potentially relevant sections of the Heritage Act include:</p> <ul style="list-style-type: none"> • Sections 57 and 60 (approval) where items listed on the State Heritage Register are to be impacted • Sections 139 and 140 (permit) where relics are likely to be exposed. <p>The Blackheath Railway Station Group and interiors heritage item is located within the Proposal study area. This item is listed on the Blackheath Railway Station is listed on the State Heritage Register (Item No: 5011931) and the <i>Blue Mountains Local Environmental Plan 2015</i> (item BH029) and therefore an approval under Section 60 of the Heritage Act would be required.</p> <p>A Statement of Heritage Impact assessment has been prepared for the Proposal and the findings are summarised in Section 6.5.</p>
<i>National Parks and Wildlife Act 1974</i> (NPW Act) (NSW)	<p>Sections 86, 87 and 90 of the NPW Act require consent from Heritage NSW for the destruction or damage of Aboriginal objects. The Proposal is unlikely to disturb any Aboriginal objects (refer to Section 6).</p> <p>However, if unexpected archaeological items or items of Aboriginal heritage significance are discovered during the construction of the Proposal, all work would cease and appropriate advice sought.</p>

Applicable legislation	Considerations
<i>Protection of the Environment Operations Act 1997 (PoEO Act) (NSW)</i>	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.
<i>Roads Act 1993 (Roads Act) (NSW)</i>	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for work on unclassified roads. The Proposal would not result in any impacts on any classified roads and therefore consent is not required under Section 138 of the Roads Act.
<i>Sydney Water Act 1994 (NSW)</i>	The Proposal would not involve discharge of wastewater to the sewer.
<i>Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW)</i>	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.
<i>Water Management Act 2000 (NSW)</i>	The Proposal would not involve any water use (from a natural source e.g. aquifer, river – only from the network), water management work, drainage or flood work, controlled activities or aquifer interference.

4.2.4 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

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

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

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

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

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

(d) *'railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms'*

(e) *public amenities for commuters*

(f) *associated public transport facilities for railway stations...*

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

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

The Infrastructure SEPP prevails over all other environmental planning instruments except where *State Environmental Planning Policy (State Significant Precincts) 2005* or *State Environmental Planning Policy (Coastal Management) 2018* applies. 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, unlikely to be affected by any potential contaminants that exist within the rail corridor.

4.2.5 State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011

The proposal site is located on land mapped within the Sydney Drinking Water Catchment, as defined by State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011. A Neutral or Beneficial Effect (NorBE) assessment has been undertaken (refer to Appendix D). The NorBE assessment concludes that there are no expected adverse impacts to water quality from the construction or operation of the Proposal.

4.2.6 Blue Mountains Local Environmental Plan 2015

The Proposal is located within the Blue Mountains LGA.

Clause 8(1) of the Infrastructure SEPP provides that:

Except as provided by subclause (2), if there is an inconsistency between this Policy and any other environmental planning instrument, whether made before or after the commencement of this Policy, this Policy prevails to the extent of the inconsistency.

Notwithstanding this, during preparation of this REF, the provisions of the *Blue Mountains Local Environmental Plan 2015* (Blue Mountains LEP) were considered (refer to Table 4.3). Figure 4.1 shows the relevant section of the zoning map from the Blue Mountains LEP, with the location of the Proposal.

Table 4.3 Relevant provisions of the Blue Mountains LEP

Provision description	Relevance to the Proposal
Clause 2.3 – Zone objectives and Land Use Table	<p>Under the Blue Mountains LEP, the Proposal is located in areas zoned as:</p> <ul style="list-style-type: none"> • SP2 Infrastructure (Rail Infrastructure) for the proposed work associated with the station. <p>Zone objectives</p> <p>The objectives of the applicable zones are as follows:</p> <ul style="list-style-type: none"> • SP2 Infrastructure (Rail Infrastructure): • to provide for infrastructure and related uses • to prevent development that is not compatible with or that may detract from the provision of infrastructure. <p>The Proposal is consistent with the objectives of SP2 as it involves development for rail infrastructure purposes. Ancillary facilities would be temporarily located within the SP2 zone. The land occupied by these facilities would return to the existing use following construction.</p> <p>Permissible development within land zones.</p> <p>Development for the purposes of a rail infrastructure facility is permissible with consent under the provisions of the SP2 Infrastructure (Railway) zone.</p>
Clause 5.10 – Heritage conservation	<p>Clause 5.10 of the Blue Mountains LEP provides for the protection of items, places and archaeological sites which have been identified in the Blue Mountains LEP as having heritage significance. Blackheath Railway Station Group and interiors (item BH029) is listed on the heritage schedule of the Blue Mountains LEP.</p> <p>The potential impacts to local heritage are considered in Section 6.5.</p>
Clause 6.3 – Terrestrial biodiversity	<p>Clause 6.3 of the Blue Mountains LEP aims to protect, maintain and improve the diversity and condition of native vegetation and habitat. The Proposal study area is not mapped as having terrestrial biodiversity.</p>
Clause 6.14 – Earthworks	<p>Clause 6.14 of the Blue Mountains LEP aims to ensure that earthworks for which development consent is required would not have a detrimental impact on environmental functions or processes (including waterways, riparian land and groundwater), neighbouring uses, cultural or heritage items or features of the surrounding land.</p> <p>By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the Proposal is permissible without development consent. Notwithstanding this, consideration of the potential impacts on landforms, geology and soils is provided in Section 6.8.</p>

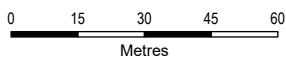
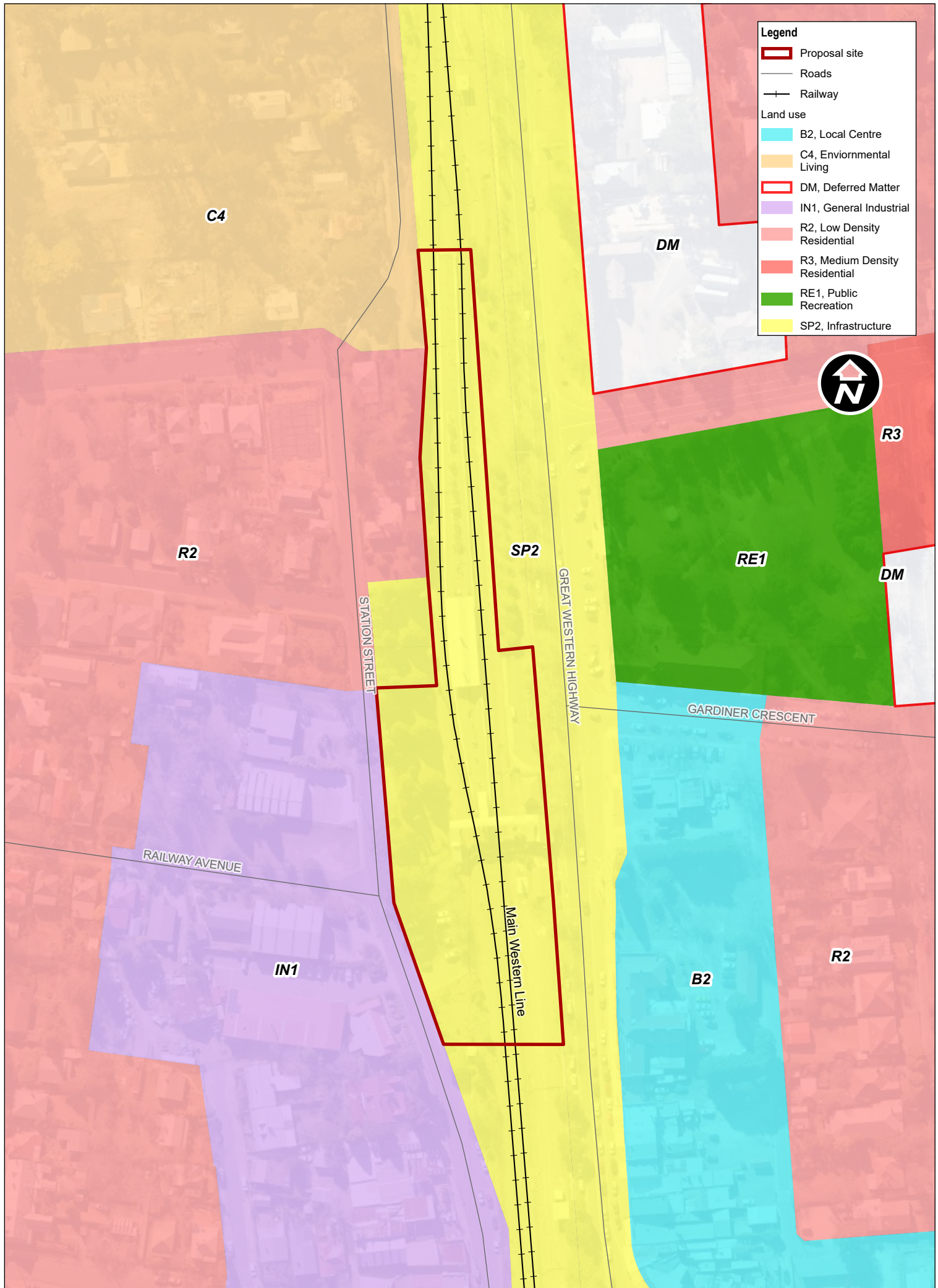


Figure 4.1 - Blue Mountains LEP zoning map

4.3 Ecologically sustainable development

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

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

The principles of ESD have been adopted by Transport for NSW throughout the development and assessment of the Proposal. Section 4.3 summarises how ESD would be incorporated in the design development of the Proposal. Section 6.13 includes an assessment of the Proposal on climate change and sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5 Community and stakeholder consultation

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

5.1 Stakeholder consultation during concept design

Key stakeholders for Blackheath Station include Sydney Trains, NSW Trains, Heritage NSW, and Blue Mountains City Council, were engaged during the development of the Concept Design Plan to provide insights into the station's deficiencies, scope of work, and also participate in the development and assessment of the station improvement options.

Workshops, briefing and consultation sessions were held with Sydney Trains, NSW Trains, Blue Mountains City Council and Heritage NSW during development of concept design and detailed design.

Community consultation

Between Monday 23 September and Monday 21 October 2019, community feedback was sought on the early concept design for the proposed Blackheath Station Upgrade. The project team met with community members at two local information sessions in October, and over 40 submissions were received during the public display period.

The feedback received has been used to help the project team understand what is important to customers and the community and would contribute towards the further design.

Key themes that emerged were:

- general support for the station to become accessible
- requests for more commuter parking
- heritage preservation
- requests to maintain/extend/upgrade the existing, non-compliant pedestrian level crossing
- questions around management of the Bundarra pedestrian/vehicle crossing.

5.2 Consultation requirements under the Infrastructure SEPP

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

Table 5.1 provides details of consultation requirements under the Infrastructure SEPP for the Proposal.

Table 5.1 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 Consultation with Councils – development with impacts on council related infrastructure and services	<p>Consultation is required where the Proposal would result in:</p> <ul style="list-style-type: none"> 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. 	<p>The Proposal includes work that would:</p> <ul style="list-style-type: none"> disrupt pedestrian and vehicle movements impact on road pavements under Council’s care and control impact on Council-operated footpaths. <p>Consultation with Blue Mountains City Council has been undertaken and would continue throughout the detailed design and construction phases.</p>
Clause 14 Consultation with Councils – development with impacts on local heritage	<p>Where railway station work:</p> <ul style="list-style-type: none"> substantially impact on local heritage item (if not also a State heritage item) substantially impact on a heritage conservation area. 	<p>Blackheath Station Group is listed on the Blue Mountains LEP. The proposal would impact this item. Consultation with Council would be undertaken regarding the Proposal and would continue through the next stages of the Proposal. Refer to Section 6.5 for further information on potential heritage impacts.</p>
Clause 15 Consultation with Councils – development with impacts on flood liable land	<p>Where railway station work:</p> <ul style="list-style-type: none"> impact on land that is susceptible to flooding – reference would be made to <i>Floodplain Development Manual: the management of flood liable land</i>. 	<p>The Proposal is not located on land that is susceptible to flooding. Accordingly, consultation with Council is not required in regard to this aspect (refer to Section 6.9).</p>
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	<p>Where railway station work:</p> <ul style="list-style-type: none"> impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land. 	<p>The Proposal is not located on land within a coastal vulnerability area. Accordingly, consultation with Council under Clause 15A is not required.</p>
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	<p>Where railway station work:</p> <ul style="list-style-type: none"> impact on flood liable land - written notice must be given (together with a scope of work) to the State Emergency Services and taken into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given. 	<p>The Proposal is not located on flood liable land. Accordingly, consultation with State Emergency Service under Clause 15AA is not required (refer to Section 6.9).</p>

Clause	Clause particulars	Relevance to the Proposal
Clause 16 Consultation with public authorities other than Councils	<p>For <i>specified development</i> which includes consultation with the NSW NSW Department of Planning and Environment for development that is undertaken adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i>, and other agencies specified by the Infrastructure SEPP where relevant.</p> <p>Although not a specific Infrastructure SEPP requirement, other agencies Transport for NSW may consult with could include:</p> <ul style="list-style-type: none"> • Sydney Trains • NSW Trains • NSW Department of Planning and Environment. 	<p>The Proposal is not located immediately adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i>. Accordingly, consultation with the NSW Department of Planning and Environment on this matter is not required.</p>

5.3 Consultation strategy

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

The objectives of the consultation strategy are to:

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

5.4 Public display

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

- public display of the REF at the station waiting room
- installation of information signage at the station with QR codes taking customers to the Proposal webpage
- public display of the REF on the Proposal webpage

- distribution of a Proposal update at the station, and to local community and rail customers, outlining the Proposal and inviting feedback on the REF
- advertisement of the REF public display in three 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
- advertisement of the REF exhibition on radio and social media during the three-week consultation period
- notify via email over 2,500 stakeholders and letterbox drop to 700 properties surrounding the station of the REF public display and inviting feedback
- two online community information sessions on Wednesday 9 March at 5.30pm and Thursday 17 March 2022 at 10.30am via Microsoft Teams
- consultation with Blue Mountains City Council, Sydney Trains, NSW Trains and other non-community stakeholders.

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

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

1. Blackheath Station Waiting Room

The REF would also be available on the [Transport for NSW website](http://www.transport.nsw.gov.au)¹. Information on the Proposal would be available through the Project Infoline (1800 684 490) or by [email](mailto:projects@transport.nsw.gov.au)².

Feedback can be sent to:

- (a) projects@transport.nsw.gov.au
- (b) Transport Access Program – Blackheath Station Upgrade
Associate Director Environmental Impact Assessment
Transport for NSW
PO Box K659
Haymarket NSW 1240

Or submitted:

- (a) in person at the collection box within the station waiting room at Blackheath Station
- (b) via yoursay.transport.nsw.gov.au/blackheathstation

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 Proposal should it be determined to proceed.

¹ <http://www.transport.nsw.gov.au/projects-tap>

² yoursay.transport.nsw.gov.au/blackheathstation

5.5 Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal (the area around Blackheath Station) plus a 200 metre radius, on 3 February 2022. No Aboriginal sites or items were identified within the search area, and therefore no sites would be impacted by the Proposal.

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

5.6 Ongoing consultation

At the conclusion of the public display period for this REF, Transport for NSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by Transport for NSW before determining whether to proceed with the Proposal (refer to Figure 3.1).

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

6 Environmental impact assessment

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

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

6.1 Traffic and transport

A *Traffic, Transport and Access Impact Assessment (TT&AIA)* (GHD, 2022a) has been prepared for the Proposal. The TT&AIA provides the following:

- impacts to traffic and access from construction of the Proposal
- a pedestrian modelling analysis undertaken for the operational phase of the Proposal with reference to the Fruin Level of Service (LoS) criteria
- an assessment of the impacts of proposed upgrade arrangements on pedestrian flows at pinch points within and in proximity to Blackheath Station.

No on-site pedestrian survey, traffic modelling, intersection or mid-block assessment of traffic impacts were undertaken as part of the assessment. The AM and PM peak period station pedestrian demands for 2017 provided in the *Blackheath Station Scoping Design Report Pedestrian and Traffic Analysis* (Stantec 2019) have been used to inform the baseline pedestrian demand. Forecast morning and evening 2036 and 2036+15 per cent weekday peak pedestrian demands at Blackheath Station were obtained from data provided by Transport for NSW.

The findings of the assessment are summarised in this section.

6.1.1 Existing environment

Blackheath Station

Blackheath Station is located on the Blue Mountains Line providing intercity and local connections. The line operates between Lithgow and Sydney central business district via Katoomba, Springwood, Penrith, Blacktown and Parramatta Train services typically run with:

- 15 to 20 minute frequencies during peak weekday periods
- 60 minutes frequencies during off-peak weekday periods, weekends and public holidays.

Access to Blackheath Station is provided from the Great Western Highway as shown Photo 6.1, and from Station Street. The Station Street entrance also provides a pedestrian link between the commuter car park and Blackheath Station as shown in Photo 6.2.



Photo 6.1 Access from the Great Western Highway



Photo 6.2 Access from Station Street and the commuter car park shown to the left

Station usage

A summary of station entry and exit counts undertaken by Transport for NSW at Blackheath Station between 2016 and 2019 is shown in Figure 6.1. This data indicates that there was an increase in daily patronage between 2016 and 2018, followed by a large decrease between 2018 and 2019.

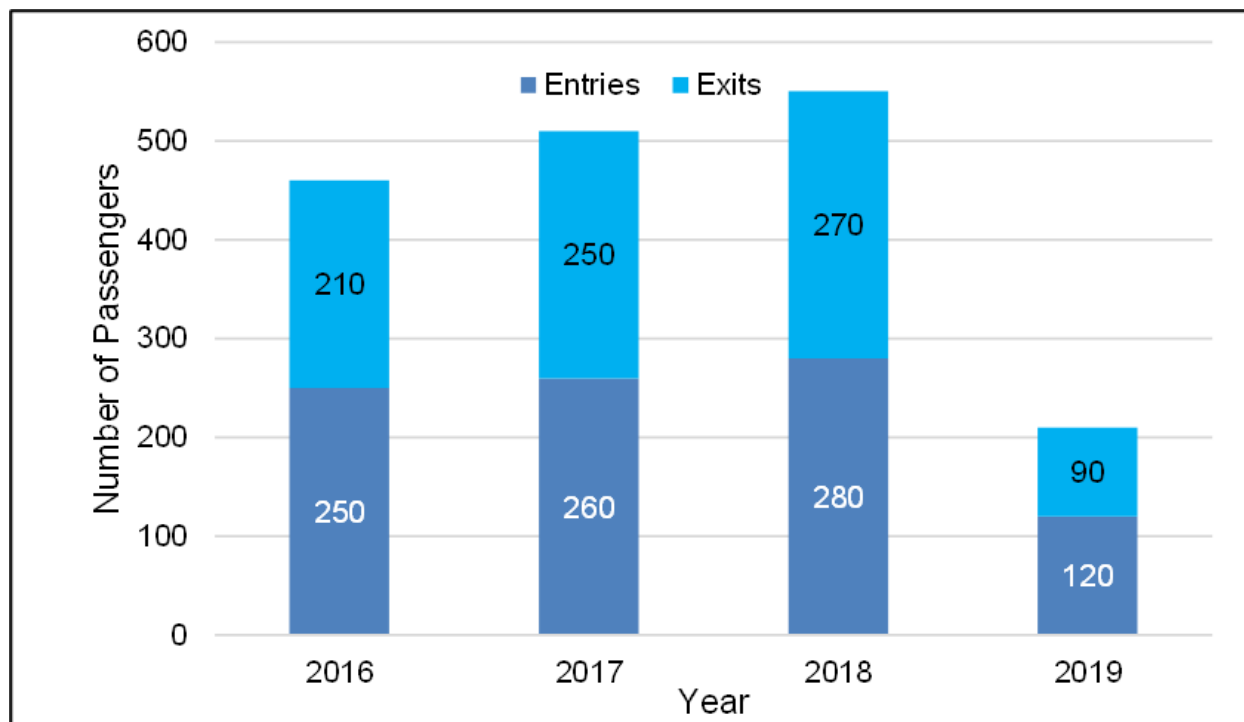


Figure 6.1 24 hour station entries and exits – Blackheath Station

Car parking

An existing commuter car park with 20 parking spaces is located adjacent to the west side of Blackheath Station and is accessed/egressed to/from Station Street. The commuter car park currently does not provide any designated accessible parking spaces. In proximity to the south of the station, time-restricted parking is provided on the Great Western Highway (one hour parking 8:30am – 6:00pm Monday to Friday and 8:30am – 12:00pm Saturday).

The time-restricted parking areas support the operation of the Blackheath town centre and discourage commuters from parking on the road network in proximity to Blackheath Station.

Unrestricted on-street parking is typically available on Station Street south of the station.

A total of five parking spaces are available within the informal kiss and ride area on the eastern side of the station, with two of these being designated as accessible parking spaces (refer to Photo 6.3). The other three spaces are signed as no parking and are used informally for kiss and ride activity. These are accessed from the Great Western Highway, adjacent to the east of Blackheath Station. All movement through the informal kiss and ride area is one way in a south to north direction.



Photo 6.3 Accessible parking and informal kiss and ride bays

Interchange facilities and active transport

The bus services operating in proximity to Blackheath Station include:

- 698 Katoomba to Blackheath (loop service), operates two services at the station per day (8:10am and 8:51am)
- 698V Katoomba to Mt Victoria (Loop Service), operates three services at the station per day (11:33am, 2:37pm and 4:20pm).

Bicycle lockers are provided adjacent to the east of the station, as shown in Photo 1.4. The bicycle network in the vicinity of Blackheath Station identifies the Great Western Highway in proximity to the station as being a “hard difficulty” route, with roads to the east of the station, including Hat Hill Road and Govetts Leap Road as being “moderate difficult” routes.

Footpaths are provided on either side of the Great Western Highway. A signalised pedestrian crossing is provided across the Great Western Highway, which is located adjacent to the entrance of Blackheath Station. Additionally, a narrow footpath is provided on the western side of Station Street.

A taxi zone is located on the western side of the Great Western Highway located to the south of the station entrance, indicated by taxi zone signage.

Road network

Blackheath Station is bounded by Station Street on the western side and The Great Western Highway to the east.

Station Street is a local road with a single travel lane in either direction.

The Great Western Highway is an arterial road that links Sydney with Bathurst. In proximity to Blackheath Station, it provides a single travel lane in either direction.

6.1.2 Potential impacts

a) Construction phase

Site compound and haulage routes

A construction compound would be established on the eastern side of Station Street to the south of the existing commuter car park. The construction compound would be fenced to maintain public safety. The proposed construction compound location is shown in Figure 1.2.

The commuter car park on Station Street would also be used intermittently during the construction works. The extent to which the commuter car park would be utilised during construction works would be confirmed during detailed design in consultation with Transport for NSW and Blue Mountains City Council. This may include the following activities:

- rail possessions when the station would be closed
- site mobilisation
- lift construction
- minor regrading and line marking of the car park.

The proposed routes to access the proposal site are:

- from the south via the Great Western Highway, Bundarra Street and Station Street
- from the north (if required) via the Great Western Highway, the unnamed bridge road and Station Street.

Where possible, deliveries would be timed to occur outside morning and afternoon peak periods of commuter activity at Blackheath Station.

Traffic

Road closures are not proposed on the road network for the duration of the Proposal construction works.

The majority of heavy vehicle activity associated with the Proposal would be associated with the movement of delivery trucks and concrete trucks. Construction vehicle movements are expected to fall within typical fluctuations of daily traffic movements on surrounding local streets and therefore not adversely affect the operation of the existing road network in proximity to Blackheath Station.

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

Public transport

Some of the works associated with the Proposal would occur on weekends during scheduled rail shutdowns. These scheduled closures would occur regardless of the upgrade when part of the rail network is temporarily closed and trains are not operating. Buses would replace trains during rail shutdown periods.

As per current arrangements, the bus stop to support weekend rail closures, would be set up on the Great Western Highway, in proximity to the station entrance.

Bus services may be subject to minor delays due to interactions with construction vehicles accessing/egressing the work area from the Great Western Highway.

Generally, the construction impacts associated with the upgrade of Blackheath Station are expected to have a negligible impact on the operation of public transport services.

Parking

The construction works at Blackheath Station would require the closure of the commuter parking on Station Street (and the temporary loss of the 20 parking spaces) for periods of up to two weeks on seven occasions across the 12 month indicative construction period.

Unrestricted on-street parking is available on a number of roads within the 400 metre walking catchment, including Bundarra Street, Bradley Avenue, Murri Street and Waragil Street. The findings presented in the TT&AIA indicates that there is typically significant spare parking capacity on these local roads in proximity to Blackheath Station.

Additionally, the volume of additional on-street parking demand (up to 20 vehicles) and periods of demand (up to two weeks at a time) are short. Accordingly, the parking impacts associated with the temporary closure of the commuter car park are expected to be minor.

The impacts on the informal kiss and ride area caused by the construction works at Blackheath Station are expected to be negligible.

Pedestrians and cyclists

Other than during possessions when trains are not operating, pedestrian access to the Blackheath Station would be maintained from Station Street and Great Western Highway for the duration of construction. Pedestrian access to the platform would be via the footbridge and stairs during construction; with the level crossing decommissioned early in the works to permit the construction of the new lift 2.

Property access

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

Emergency vehicle access

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

b) Operational phase

Blackheath Station pedestrian demand

The pedestrian demand assessment considered the baseline demand (refer to Figure 6.1) and the morning peak period and peak hour station patronage forecast for 2036 provided by Transport for NSW (Stantec, 2019). The evening peak hour patronage has been estimated using the same percentage of demand for the morning peak period (30 per cent of the four-hour peak demand). These movements are shown in Table 6.1.

Table 6.1 Current peak and 2036 + 15 per cent forecast station patronage

Time period	Baseline 2017			2036 + 15 per cent forecast station patronage		
	Pedestrian demand (Total)	Assumed entries	Assumed exits	Pedestrian demand (Total)	Assumed entries	Assumed exits
AM peak hour (6am – 7am)	16	13	3	21	17	4
PM peak hour (6pm – 7pm)	16	3	13	21	4	17

The pedestrian modelling analysis indicates that all of the pinch points are expected to operate at a satisfactory LoS A during the morning and evening peak periods.

Pedestrian safety and access to Blackheath Station would be improved by providing the following:

- installation of three new 17 person lifts between:
 - the Great Western Highway entry and the existing footbridge
 - the Station Street entry and the existing footbridge
 - the existing footbridge and the island platform
- upgrade of the Station Street entrance to provide accessible paths between the new lift and existing stairs and the new accessible parking spaces in the commuter car park upgrade of the station entrance off the Great Western Highway to provide accessible paths between the new lift, existing stairs and the upgraded kiss and ride bay and taxi zone, and the pedestrian crossing of the Great Western Highway outside the station entrance
- upgrade of the ramp connecting the new lift to the station platform
- resurfacing of the entire platform, and regrade the platform as required to provide accessible paths connecting the new lift, existing stairs, boarding assistance zones, family accessible toilet, waiting room and other customer facilities at the station
- sheltered rest area along the access path between the station entry and the upgraded kiss and ride spaces.

Car parking

The commuter car park at Blackheath Station currently provides 20 parking spaces, none of which are accessible parking spaces.

The Proposal would convert three standard existing parking bays to two accessible parking bays located adjacent to the access path. A dedicated shared zone is provided between the two accessible parking bays with this shared zone not available for parking. Additionally, it is proposed to expand the car park to the south and provide an extra ten standard car parking spaces in this extended area (net increase of seven parking spaces available for general commuter use). The number of additional spaces that can be provided would be confirmed in the detailed design stages. The new parking spaces would be designed in accordance with *Australian Standard AS2890.1 Part 1: Off-street car parking*.

Within the existing informal kiss and ride area, it is proposed to convert the parking area to provide one taxi space, one kiss and ride bay and a NSW Trains maintenance vehicle parking zone. The kiss and ride bay and taxi space will be accessible and for use by all customers.

Considering the relatively low peak hour patronage at Blackheath Station (refer to Table 6.1), the reduction of one kiss and ride space is expected to have a negligible impact on the operation of the station.

Traffic impacts

The Station Street commuter car park is expected to increase in size from 20 spaces to 28 - 30 spaces in total as part of the Blackheath Station upgrade. The additional vehicle activity associated with these spaces is expected to have no significant traffic impacts within the vicinity of the station.

Any additional vehicle activity is expected to fall within typical daily fluctuations on the adjoining road network.

Interchange facilities and active transport

No changes to the bus services or infrastructure are proposed as part of the upgrade of Blackheath Station.

Pedestrian access to Blackheath Station would be improved by providing the following:

- upgrade of the ramp providing access from the new lift to the island platform
- resurfacing of the entire island platform, and regrade the platform as required to provide accessible paths connecting the new lift, existing stairs, boarding assistance zones, family accessible toilet, waiting room and other customer facilities at the station
- sheltered rest area along the access path between the station entry and the upgraded kiss and ride spaces.

Cycle facilities would be improved by provision of a minimum of five additional bicycle parking hoops, which can accommodate up to ten bicycles, within 60 metres of the Blackheath Station. The current bicycle lockers would be maintained within the informal kiss and ride area off the Great Western Highway.

The existing taxi zone located on the Great Western Highway south of the station entrance would be maintained. Within the existing informal kiss and ride area, it is proposed to adjust the parking area to provide one accessible taxi space bay.

6.1.3 Mitigation measures

Mitigation measures for ensuring pedestrian and bicycle rider access and safety are not compromised would include traffic control near the pedestrian and bicycle access points at the Station Street and the Great Western Highway, particularly when large vehicles need to access the site during construction.

A detailed Construction Traffic Management Plan (CTMP) would be prepared prior to the commencement of works with site induction for construction personnel being undertaken to outline the requirements of the CTMP. The aim of the CTMP is to maintain the safety of all workers and road users within the vicinity of the site and outline mitigation measures of construction traffic impacts. The CTMP would be prepared by the Contractor in consultation with Transport for NSW and provided to Blue Mountains City Council.

No operational mitigation measures have been identified as required.

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures.

6.2 Urban design, landscape and visual amenity

This section provides a summary of the *Landscape and Visual Impact Assessment* (GHD 2022b). The methodology used to undertake this assessment is provided in Section 2 of the *Landscape and Visual Impact Assessment* (GHD, 2022b).

The assessment included a desktop analysis and site inspection to identify the potential visual impacts of the Proposal on views to the station from surrounding publicly accessible areas.

6.2.1 Existing environment

Blackheath is one of a chain of small villages near the Blue Mountains National Park. The rail line and the Great Western Highway follows the main western ridge, and urban development is constrained by steep slopes. The centre of this village radiates from the station area and Great Western Highway retail strip, with residential areas surrounding in all directions.

Landscape values in the wider area include the nearby natural features such as cliffs, escarpments, gorges and forest; heritage features associated with the village centre particularly along Great Western Highway, Govetts Leap Road and in the station precinct; and distant views from lookouts typically looking towards the Blue Mountains or Megalong Valley and away from the proposal site.

Despite the area having spectacular views along the Megalong Valley and Grose Gorge, due to the location of Blackheath along a high ridge and with the visual enclosure of the surrounding settlement, there are no significant views towards the mountains or valleys from the station precinct and village centre. Figure 6.2 illustrates the area from which the station can be viewed and key viewpoints looking towards the station.

The study area has been classified into three landscape character zones (LCZs) which have informed the landscape impact assessment. The three LCZs identified are as follows:

- LCZ1: Blackheath Village Centre
- LCZ2: Blackheath Plateau Settlement
- LCZ3: Blackheath Forest Plateau and Escarpment.

Figure 6.3 shows the landscape character zones which surround the proposal site.

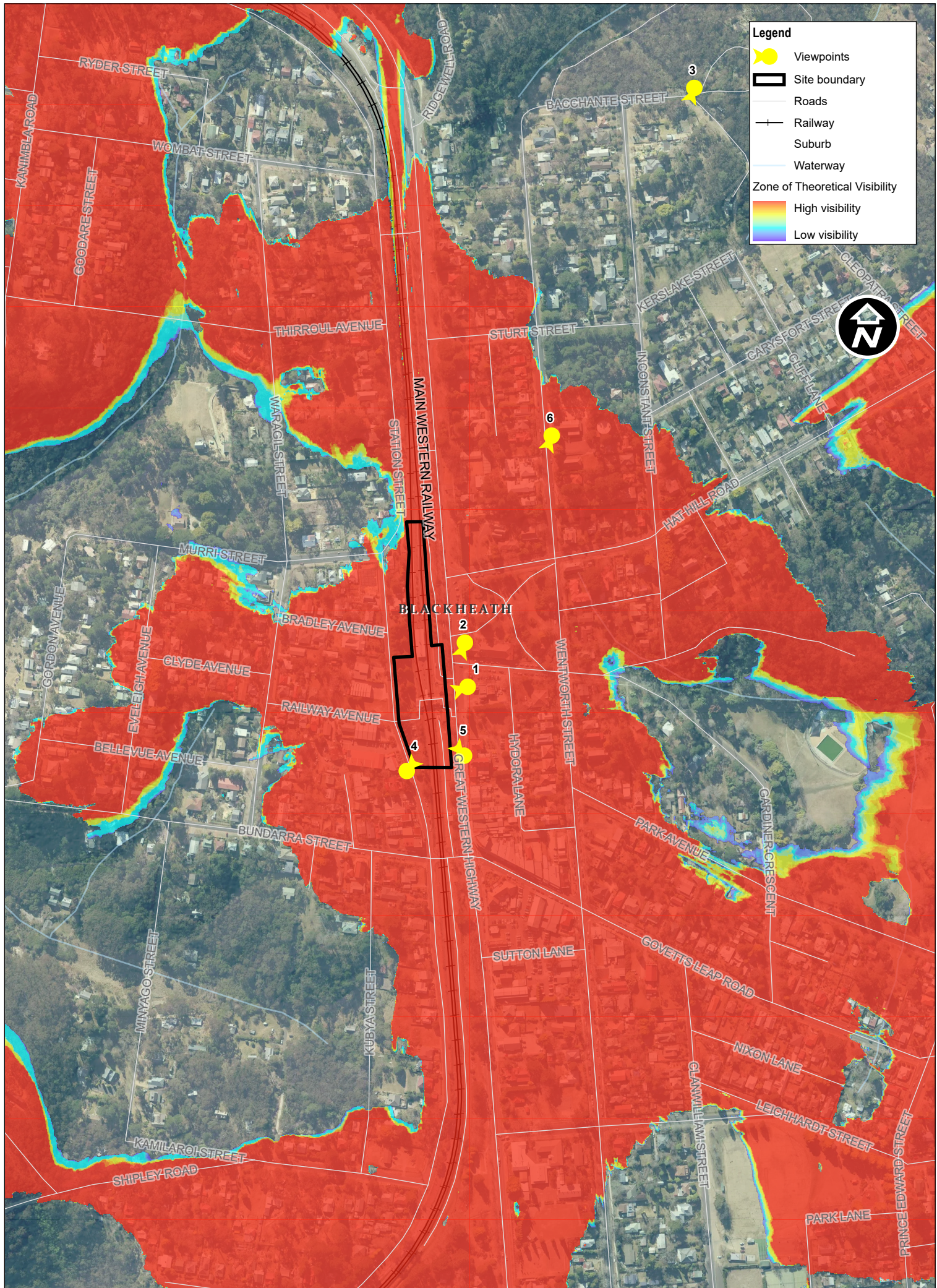


Figure 6.2 - Zone of Theoretical Visibility and viewpoint locations

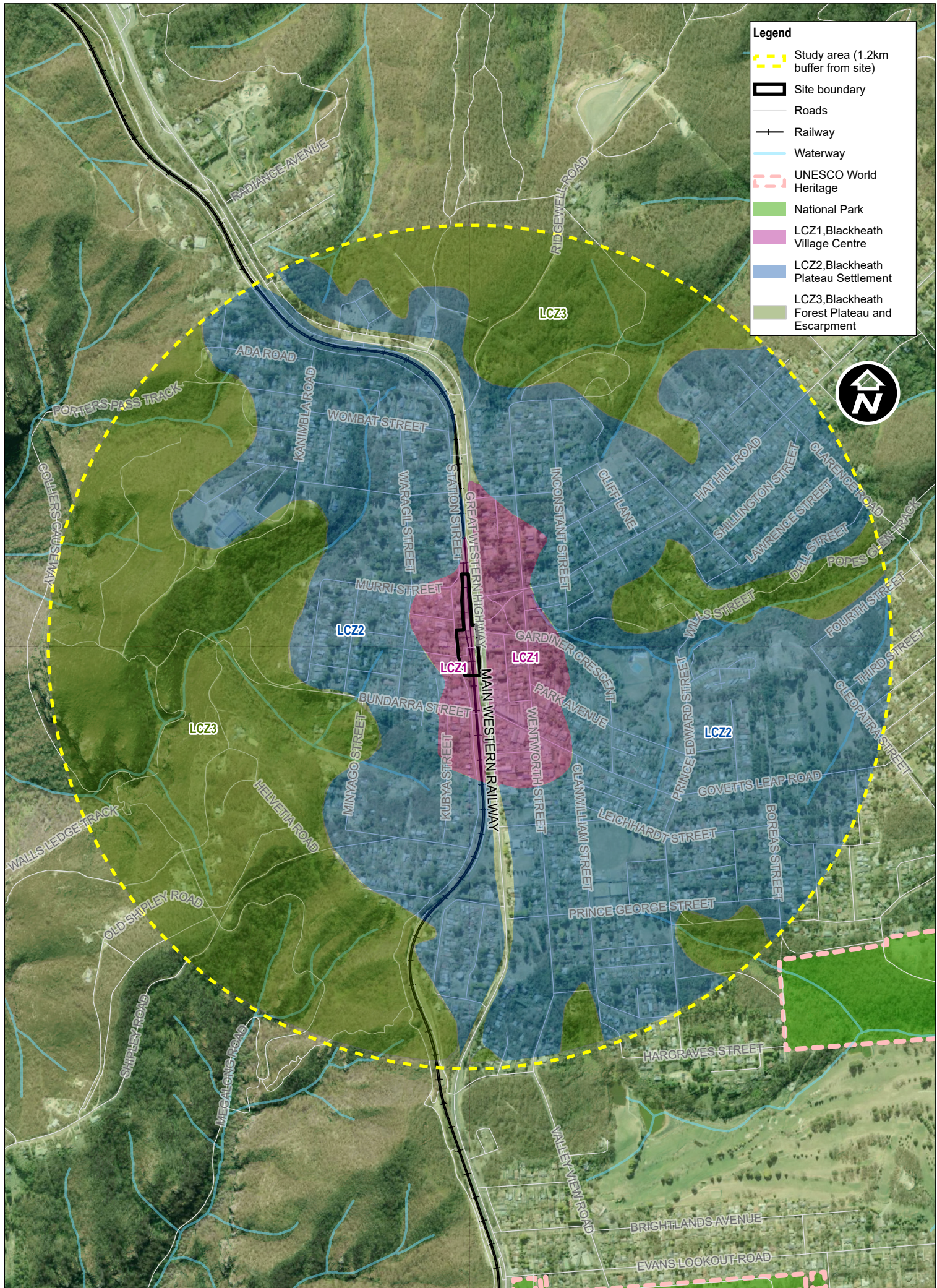


Figure 6.3 - Landscape character zones

The viewpoints were selected to represent the range of views to the Proposal. The following six locations were chosen:

- Location 1 (VP01) – Blackheath station pedestrian crossing, opposite at the Old Tythe Barn – Great Western Highway
- Location 2 (VP02) – Blackheath Area Neighbourhood Centre, 41 Gardiner Crescent, Blackheath
- Location 3 (VP03) – Campbell Rhododendron Gardens, 1 Bacchante Street, Blackheath
- Location 4 (VP04) – 132 Station Street, Blackheath
- Location 5 (VP05) – Gardners Inn Hotel – 255 Great Western Highway, Blackheath
- Location 6 (VP06) – 158 Wentworth Street, Blackheath (Next to Sacred Heart Church).

Photographs of each viewpoint are provided in Photo 6.4 to Photo 6.9.



Photo 6.4 Viewpoint location 1: Pedestrian crossing adjacent to The Old Tythe Barn



Photo 6.5 Viewpoint location 2: Blackheath Area Neighbourhood Centre



Photo 6.6 Viewpoint location 3: Campbell Rhododendron Gardens



Photo 6.7 Viewpoint location 4: Station Street



Photo 6.8 Viewpoint location 5: Gardners Inn Hotel – 255 Great Western Highway, Blackheath



Photo 6.9 Viewpoint location 6: Wentworth Street, Blackheath – existing view

6.2.2 Potential impacts

a) Construction phase

During construction there would be a number of elements within the proposal site that are consistent with construction activities and typical of construction of this scale. Site sheds, cranes, fencing and movement of construction vehicles associated with the construction activities can be expected on site over the 12-month construction period until the completion of the Proposal.

Construction works would result in temporary landscape and visual impacts which may extend beyond the proposal site. Landscape and visual impacts associated with construction activities are however temporary in nature.

Landscape and visual impacts during construction resulting from those activities outlined in Section 3 may include:

- the presence of a crane required for lift construction
- the presence of plant including, excavators, crane trucks, piling rigs, concrete trucks and concrete pumps
- temporary safety screens between the work being undertaken and the public domain, platform and pedestrian overbridge
- presence of construction traffic and workers
- light spill from the compound site and work areas, particularly during out-of-hours work
- compound areas
- importation and storage of construction equipment and plant
- materials stockpiling and the presence of incomplete structures
- construction activities to the lifts, which may be visible above safety screens from street level.

b) Operational phase

Landscape character impact assessment

The LCZs have different associated sensitivities to potential changes as a result of the Proposal. The sensitivities are discussed below and have informed the landscape impact assessment. LCZ1 Blackheath Village Centre was found to have moderate-low impact, associated with the heritage values and character of the station area and Greater Blue Mountains Drive. The remaining landscape character zones were found to have Negligible impact. Overall, this assessment found there to be no significant landscape character impacts arising from the Proposal. Table 6.2 summarises the predicted impacts to the landscape character around the proposal site.

Table 6.2 Summary of landscape impacts

LCZ	Description	Sensitivity to change	Magnitude of change	Overall Rating
LCZ1	Blackheath Village Centre	Moderate	Low	Moderate-low
LCZ2	Blackheath Plateau Settlement	Negligible	Negligible	Negligible
LCZ3	Blackheath Forest Plateau and Escarpment	Negligible	Negligible	Negligible

Visual impact assessment

Table 6.3 summarises the daytime operational impacts assessed at each of the representative viewpoint locations. Sensitive visual receivers in the study area include residents, pedestrians, road users and commuters. The assessment found that the Proposal generally has negligible to moderate visual impact on all viewpoint locations.

The most significant impacts are from viewpoint locations one and four, representing views from pedestrians, road users on Great Western Highway and residential houses in close proximity to the Proposal. During winter months, views from locations two and five will be filtered through bare tree branches, when the seasonal foliage is not present.

The Proposal would result in the removal of up to three smaller introduced trees and 18 shrubs (Tree Survey, 2021). The large trees with mature canopies would be avoided and protected, if possible. As the mature large canopy trees provide the majority of the visual screening around the station area, it is assumed that the proposed vegetation removal would not have a significant impact to the views from the viewpoints assessed within this report.

Artistic representations of the Proposal are provided in Figure 3.2, Figure 3.3 and Figure 3.4.

Table 6.3 Summary of visual impacts

Viewpoint	Location	Sensitivity to change	Magnitude of change	Overall Rating
VP01	Blackheath Station pedestrian crossing	High	Low	Moderate
VP02	Blackheath Area Neighbourhood Centre	High	Negligible (Summer) Low (Winter)	Negligible (Summer) Moderate (Winter)
VP03	Campbell Rhododendron Gardens, Bacchante Street, Blackheath	High	Negligible	Negligible

Viewpoint	Location	Sensitivity to change	Magnitude of change	Overall Rating
VP04	Station Street, Blackheath	High	Low (Summer) Low (Winter)	Moderate
VP05	Gardners Inn Hotel	High	Negligible (Summer) Low (Winter)	Negligible (Summer) Moderate (Winter)
VP06	158 Wentworth St, (Next to Sacred Heart Church)	High	Negligible	Negligible

Urban design

An urban design plan (DesignInc, 2021) has been developed through the testing of elements and their connections to the station fabric that is place-specific. The design of the upgrade has selected a minimalist approach for new works to be complementary whilst protecting the heritage fabric and values of the station.

The objective of the architectural design is to provide an accessibility upgrade that respects the heritage condition of the precinct using as inspiration the local characteristics of the Blackheath village: the built form, the landscape and the outstanding natural context.

A complementary material palette has been selected for durability, cladding to respond to the character of the station and concrete finishes for lower sections of the lift shafts. The material choices and colours aim to strike a balance between functionality, longevity and respecting the existing heritage character and fabric of Blackheath Station. The materials and finishes would be durable, robust, sustainable, maintainable, safe and cost effective.

Lift shafts would be pre-cast concrete with horizontal banding, stained to soften the standard grey off-form concrete to better integrate with the existing station context. The upper portion would comprise aluminium cladding in a colour to pick up the surrounding flora colours and to tone with the Manor Red used on the existing footbridge.

All steelwork, on the new lift shafts, canopies and lift landings would be dark grey in colour to better complement the existing materials. Some elements would take on the existing Manor Red colour pallet where they interface directly with the footbridge -such as balustrades. The selection introduces a neutral tone to the new works and would provide a counterbalance to the existing heritage palette which ranges from Deep Indian Red to Coffee on the existing building as per *ESB 010 – Heritage Paint Schemes*. The use of a lighter colour, Shale Grey, for the roof sheeting on the footbridge lift landings is to complement the existing roof sheeting and extend the visual plane of the roof surfaces.

The aim of the landscape design for the upgrade to Blackheath Station is to ensure the landscape elements are integrated with the existing heritage character while improving customer comfort and arrival experience. Like for like replanting would be provided for any trees and shrubbery removed for the Proposal.

6.2.3 Mitigation measures

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

The detailed design of the Proposal would be undertaken with reference to the recommendations included in the *Landscape and Visual Impact Assessment* (GHD, 2022b), and the *Urban Design and Public Domain Plan: Blackheath Station* (DesignInc, 2021). Key Proposal specific mitigation measures would include:

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

6.3 Noise and vibration

This section provides a summary of the *Noise and Vibration Impact Assessment*. The methodology used to undertake this assessment is provided in Section 3 and Section 4 of the *Noise and Vibration Impact Assessment* (GHD, 2022c).

6.3.1 Existing environment

Sensitive receivers

Receivers potentially sensitive to both noise and vibration in the following categories as defined in *Noise Policy for Industry* (EPA, 2017) and *Construction Noise and Vibration Strategy* (TfNSW, 2019b) have been identified in the surrounding area:

- residential
- passive recreation areas.

Sensitive receivers are outlined in Figure 6.4.

The prevailing background and ambient noise levels surrounding the Proposal were determined through unattended noise logging. The aim of the monitoring is to provide a representative characterisation of the long-term noise environment within the entire noise catchment area. The logging was conducted on Thursday 2 December 2021 and Friday 10 December 2021 at locations representative of two noise catchment areas:

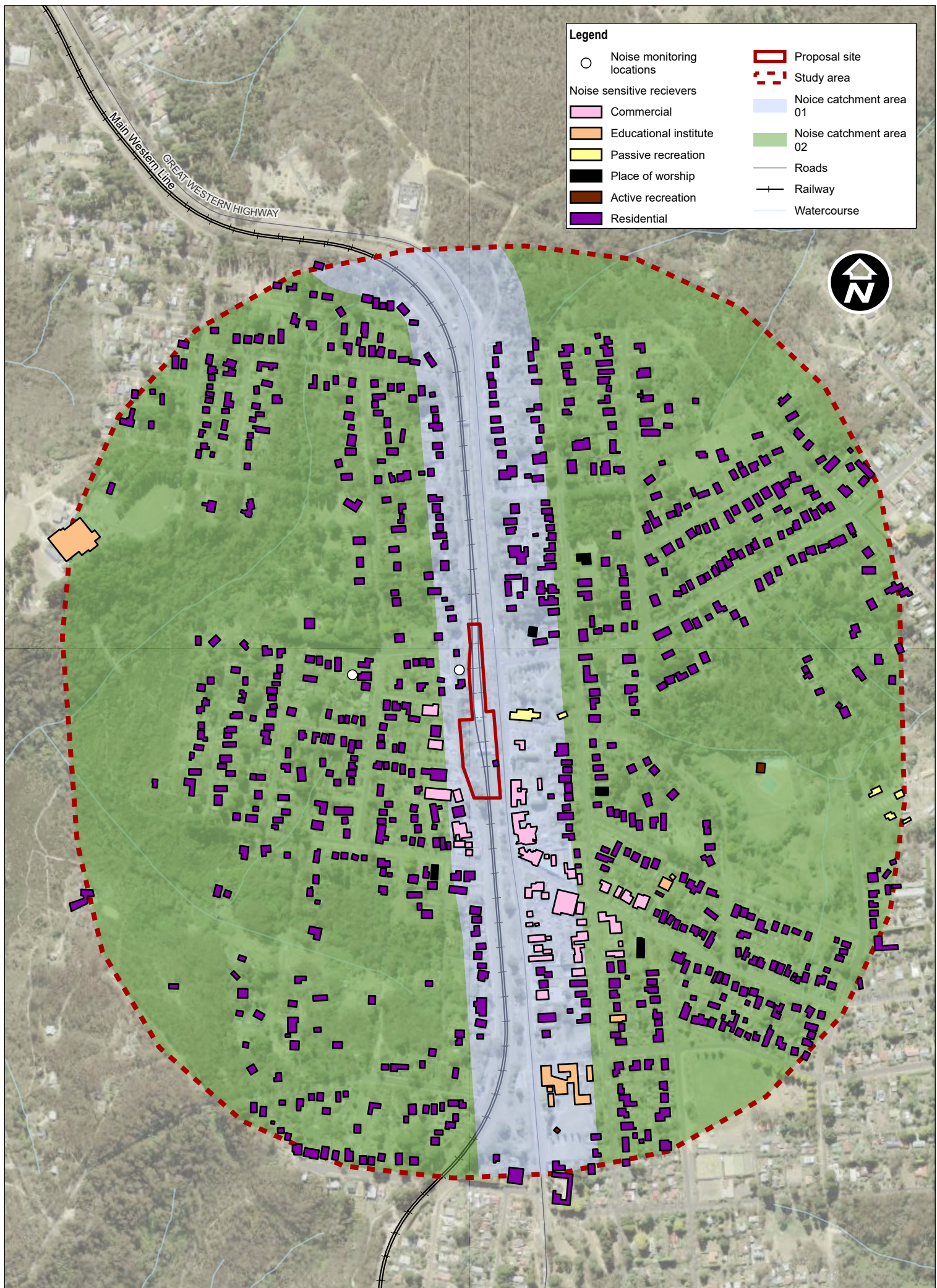
- location 1 was located near the railway at 141A Station Street, Blackheath
- location 2 was set back from the railway and highway at 22 Waragil Street, Blackheath.

The noise catchment areas are shown in Figure 6.4 and the results of the unattended and attended noise surveys and observations are detailed in Table 6.4.

Table 6.4 Summary of unattended noise monitoring results

Location	Background noise descriptors			Ambient noise descriptors		
	L _{A90} (Period)			L _{Aeq} (15m)		
	Day	Evening	Night	Day	Evening	Night
141A Station Street, Blackheath – NCA01	45	38	30(28) ¹	60	53	55
22 Waragil Street, Blackheath – NCA02	36	33	30(24) ¹	49	45	43

Note: 1. The minimum background noise level is used over the measured rating background level (bracketed) in accordance with the Noise Policy for Industry (EPA, 2017)



Legend

- Noise monitoring locations
- Proposal site
- Study area
- Noise catchment area 01
- Noise catchment area 02
- Roads
- Railway
- Watercourse

Noise sensitive receivers

- Commercial
- Educational institute
- Passive recreation
- Place of worship
- Active recreation
- Residential

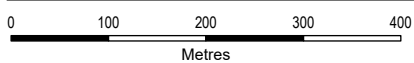


Figure 6.4 - Sensitive receivers, noise catchment areas and noise monitoring locations

6.3.2 Potential impacts

a) Construction phase

Assessment of predicted noise levels

Construction scenarios have been created based on construction equipment likely to be operating simultaneously at any given time and sited in the location subject to the work activity. This assessment method creates the maximum received noise level. Although this is unlikely to occur in practical terms, the modelling assumes the 'worst-case' scenario to identify where noise impacts could be a concern and require mitigation. These are presented in Table 6.5. These scenarios have been modelled to determine the potential construction noise impacts on the environment.

Table 6.5 Indicative construction scenarios, duration and working hours

Scenario ID	Activities	Indicative duration	Proposed working hours
CS01	Piling lift 1 and lift 2	Two days	Typically standard hours with some potential out-of-hours/ rail shut down periods work
CS02	Demolition of existing footpath and level crossing	Two days	Typically standard hours with some potential out-of-hours/ rail shut down periods work
CS03	Piling lift 3	Two days	Typically standard hours
CS04	Excavating lift pits of lift 1, lift 2 and lift 3	Six months	Typically standard hours with some potential out-of-hours/ rail shut down periods work
CS05	Resurfacing works on country end	Two days	Typically standard hours with some potential out-of-hours/ rail shut down periods work
CS06	Preassembly of lift 1, lift 2 and lift 3	Six months	Typically standard hours
CS07	Resurfacing works on city end	Two days	Typically standard hours with some potential out-of-hours/ rail shut down periods work
CS08	Erect precasts and steelworks	Two days	Typically standard hours with some potential out-of-hours/ rail shut down periods work
CS09	Assembly of lift 1 and lift 2	Two days	Typically standard hours with some potential out-of-hours/ rail shut down periods work
CS10	Assembly of lift 3	Two days	Typically standard hours
CS11	Platform tactiles	Six months	Typically standard hours
CS12	Compound Operations	Twelve months	Typically standard hours with some potential out-of-hours/ rail shut down periods work

Predicted construction noise levels from the construction scenarios are presented in full in Appendix D of the *Noise and Vibration Impact Assessment* (GHD, 2022c). Maps of the predicted noise levels, shown as noise contours, are provided in Appendix E of the Noise and Vibration Impact Assessment. A summary of exceedances of the noise management levels for residential receivers is presented in Table 6.6 during standard hours and Table 6.7 for out-of-hours work.

Residences located up to approximately 600 metres away from the proposal site are expected to be noise impacted at some point during construction. The noise management level is predicted to be exceeded by up to 22 dB in NCA01, and 23 dB in NCA02.

The highly noise affected level of 75 dBA is expected to be exceeded at one residential location, 141A Station Street. This exceedance is due to the receivers' proximity to the proposed construction works.

The highly noise affected level of 75 dBA is expected to be exceeded at one commercial location 263 Great Western Highway during platform resurfacing works. Non-residential receivers would only be noise impacted if they are in use during the time of construction. This is considered likely for works during standard construction hours. For example, places of worship at 2-8 Hat Hill Road and 123-125 Wentworth Street that would be utilised during standard hours.

Works outside standard construction hours are expected during rail possessions to complete installation works for the lifts, demolition of pre-existing footpaths and a level crossing. Works during the rail possession have been assessed for all modelled scenarios during the day, evening, and night-time assessment periods. The rail possessions would be required to limit the effect on normal rail operations and improve worker safety.

Residences located within 600 metres of the proposal site are expected to experience noise impacts during construction. These impacts would be over a short term period and limited to the proposed rail possession periods (weekend closures). The noise management levels are predicted to be exceeded by up to 28 dBA during the day, 43 dBA during the evening and 42 dBA during the night.

Table 6.6 Summary of noise management exceedance levels for residential receivers – standard hours

NCA		CS01	CS02	CS03	CS04	CS05	CS06	CS07	CS08	CS09	CS10	CS11	
NCA01	Number of exceedances above NML ¹ (55 dBA)	11	29	10	0	11	2	24	10	15	12	4	5
	Highest noise level (dBA)	66	70	67	50	77	69	69	65	68	73	69	77
	Highest exceedance (dB)	11	15	12	-	22	14	14	10	13	18	14	22
	Worst affected receiver	R518	R518	R518	R518, R572	R826	R518	R826	R518	R518	R518	R518	R826
NCA02	Number of exceedances above NML ¹ (46dBA)	100	226	96	1	88	56	165	91	148	143	28	95
	Highest noise level (dBA)	64	68	66	49	63	61	69	63	66	66	57	73
	Highest exceedance (dBA)	18	22	20	3	17	15	23	17	20	20	11	27
	Worst affected receiver	R573	R573	R573	R573	R573	R342	R573	R573	R573	R573	R573	R573

Note: 1. NML: noise management level

Table 6.7 Summary of noise management exceedance levels for residential receivers – out-of-hours construction hours

Operating Hours	NCA		CS01	CS02	CS04	CS05	CS07	CS08	CS09
Out-of-hours Day	NCA01	Number of exceedances above NML ¹ (50dBA)	31	61	0	31	45	26	42
		Highest noise level (dBA)	66	70	50	77	69	65	68
		Highest exceedance (dBA)	16	20	0	27	19	15	18
		Worst affected receiver	R518	R518	R518, R572	R826	R826	R518	R518
	NCA02	Number of exceedances above NML ¹ (41 dBA)	263	515	6	197	443	224	410
		Highest noise level (dBA)	64	68	49	63	69	63	66
		Highest exceedance (dBA)	23	27	8	22	28	22	25
		Worst affected receiver	R573	R573	R573	R573	R573	R573	R573
Out-of-hours Evening	NCA01	Number of exceedances above NML ¹ (43 dBA)	90	111	7	65	99	73	96
		Highest noise level (dBA)	66	70	50	77	69	65	68
		Highest exceedance (dBA)	23	27	7	34	26	22	25
		Worst affected receiver	R518	R518	R518, R572	R826	R826	R518	R518
	NCA02	Number of exceedances above NML ¹ (38 dBA)	463	590	15	337	549	410	524

Operating Hours	NCA		CS01	CS02	CS04	CS05	CS07	CS08	CS09
		Highest noise level (dBA)	64	68	49	63	69	63	66
		Highest exceedance (dBA)	26	30	11	25	31	25	28
		Worst affected receiver	R573	R573	R573	R573	R573	R573	R573
Out-of-hours Night	NCA01	Number of exceedances above NML ¹ (35 dBA)	119	123	25	118	121	117	119
		Highest noise level (dBA)	66	70	50	77	69	65	68
		Highest exceedance (dBA)	31	35	15	42	34	30	33
		Worst affected receiver	R518	R518	R518, R572	R826	R826	R518	R518
	NCA02	Number of exceedances above NML ¹ (35dBA)	549	622	34	515	612	531	592
		Highest noise level (dBA)	64	68	49	63	69	63	66
		Highest exceedance (dBA)	29	33	14	28	34	28	31

Note: 1. NML: noise management level

The sleep disturbance criteria are predicted to be exceeded at up to seven receivers during the loudest of the out-of-hours construction scenario (CS02). These receivers are presented in Table 6.8. Construction works during the night time period would not be continuous and daily sleep disturbance impacts during the proposed construction period would not be expected.

Table 6.8 Sleep disturbance exceedances

Receiver ID	Address	Criteria	NCA	Predicted noise level (external)	Predicted noise level (internal)
R518	2 Railway Avenue, Blackheath	65 (external) 55 (internal) ¹	NCA01	70	60
R573	139 Station Street, Blackheath		NCA02	68	58
R609	132-133 Station Street, Blackheath		NCA01	68	58
R709	140 Wentworth Street, Blackheath		NCA01	66	56
R710	142 Wentworth Street, Blackheath		NCA01	66	56
R711	144 Wentworth Street, Blackheath		NCA01	67	57
R768	136-138 Wentworth Street, Blackheath		NCA01	66	56

Note: 1. Road Noise Policy (EPA, 2011).

The noise impacts would be limited to the construction period only and would not have lasting effects on the community. The maximum noise impacts would be expected during the demolition of the existing footpath and level crossing due to the use of jackhammers, excavators and bobcats. Furthermore, all construction equipment would be operational intermittently and not continuously. As such, impacts on nearby sensitive receivers would only occur over a short duration and may not reach the worst case predicted noise levels provide by this assessment.

Construction traffic

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

The main access to Blackheath Station is via the Great Western Highway. Due to the existing high volume of traffic no road traffic noise impacts are predicted due to construction traffic along the Great Western Highway.

Some construction vehicles would use Bundarra Street and Station Street. These roads are local and would likely experience construction road traffic noise impacts as the existing heavy vehicle traffic volumes would be low.

Vibration

Certain construction activities would require the use of vibration intensive equipment that may affect the nearest sensitive receivers. The vibration intensive plant nominated as part of the work include the jackhammer and bored piling rig.

Based on the identified construction equipment proposed during construction and the location of sensitive receivers, the bored piling and jackhammering activities have been identified as potentially causing vibration impacts. Structures located within two metres of bored piling works or within one metre of jackhammering may experience structural damage.

Heritage listed structures located within four metres of bored piling works or within two metres of jackhammering may experience structural damage impacts. Blackheath Station itself is a heritage listed item and is inclusive of all structures pertaining to the station. If either of these two activities occur within these distances to any structures pertaining to Blackheath Station, then there is potential for structural damage impacts.

With consideration of human comfort levels, caution should be taken to avoid contact with structures while jackhammering.

b) Operational phase

For operational noise, the mechanical plant selections are subject to detailed design. It is not expected that the mechanical plant that would be installed would have a significant noise impact. Any mechanical plant, equipment or other operational noise source proposed is to be designed to meet the Noise Policy for Industry (EPA, 2017) noise triggers identified in this report. Operational noise would not be noticeably different to what is currently experienced at the station.

Due to the minor to negligible increase in operational noise, noise monitoring and assessment was not completed.

6.3.3 Mitigation measures

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

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures.

6.4 Aboriginal heritage

6.4.1 Existing environment

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) was undertaken on 11 February 2022 covering a one kilometre radius around Blackheath Station. The closest Aboriginal site identified was in excess of 900 metres away and therefore would not be impacted by the Proposal.

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

6.4.2 Potential impacts

a) Construction phase

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

- foundations and pits for the new lift shafts would require excavation into soils/fill and shale rock up to a depth of around three metres
- minor excavation for the construction/re-grading for new ramp, paths and decommissioning of the existing pedestrian level crossing
- minor excavation work for the extension of the existing Station Street commuter car park.

Ground disturbing activities have the potential to impact Aboriginal sites if present. However, if no known Aboriginal heritage items are located in the vicinity of the Proposal and no significant excavations are proposed, no impacts on Aboriginal heritage are expected as a result of the Proposal. The minor excavations for the proposal, although small in scale and occurring in a built environment, may still have a low potential to uncover Aboriginal heritage.

b) Operational phase

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

6.4.3 Mitigation measures

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

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures.

6.5 Non-Aboriginal heritage

This section provides a summary of the *Statement of Heritage Impact* (SoHI) prepared by Extent Heritage for Transport for NSW (Extent Heritage, 2022). The assessment included a desktop assessment and site inspection. The findings of the assessment are summarised in this section.

6.5.1 Existing environment

Previously identified heritage items located in and around the proposal site were identified through a search of heritage registers including:

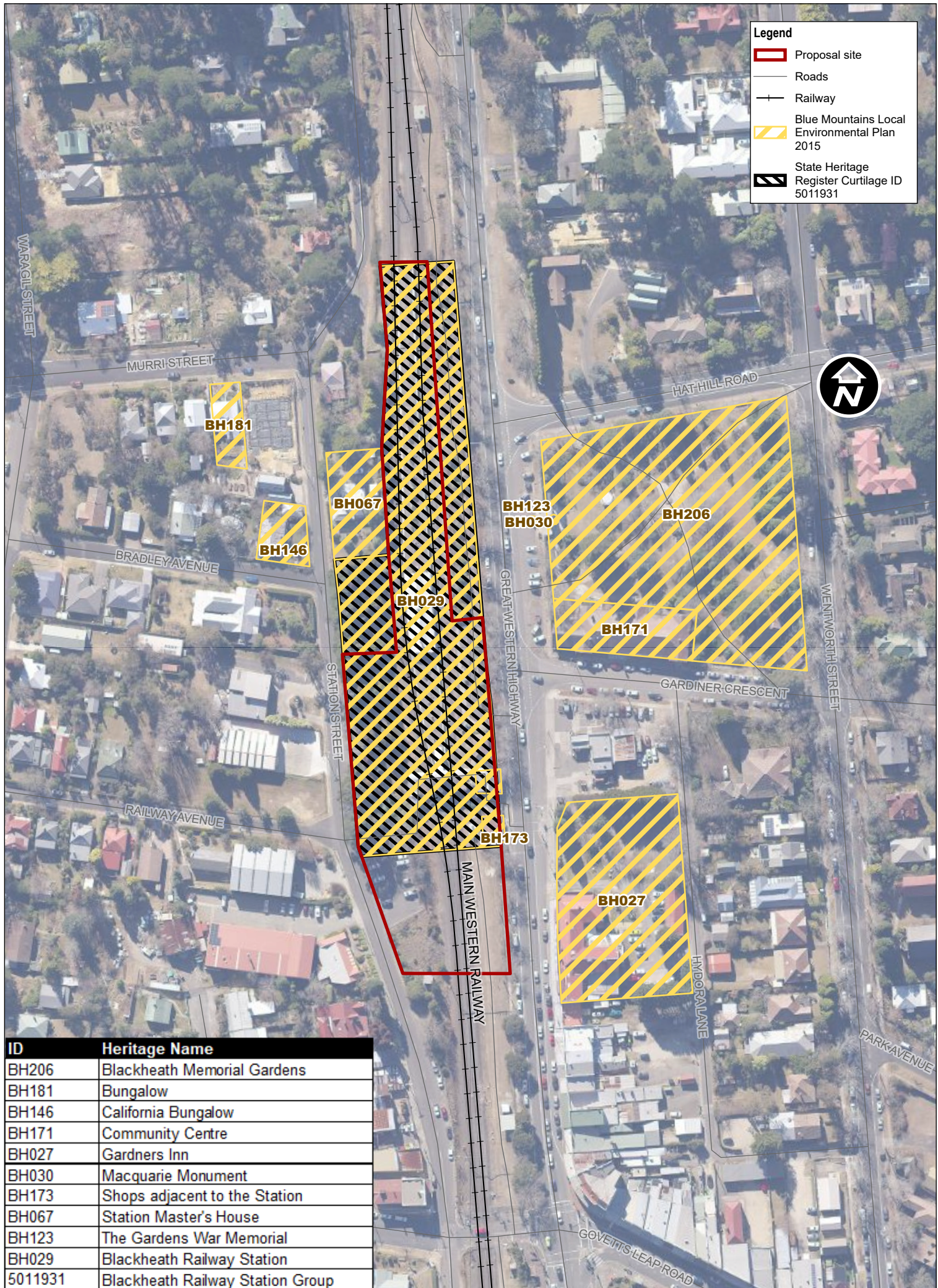
- World Heritage List
- National Heritage List
- Commonwealth Heritage List
- State Heritage Register

- TAHE State Agency Heritage and Conservation Register
- Blue Mountains LEP 2015 (heritage schedule).

Heritage items located within the proposal site or in the vicinity of the Proposal are listed in Table 6.9 and are shown in Figure 6.5.

Table 6.9 Heritage items/areas within the vicinity of the study area

Heritage item	Address	Significance	Item no.
Blackheath Railway Station Group	The proposal site	State	5011931
Blackheath Railway Station	The proposal site	Local	BH029
Gardeners Inn	255 Great Western Highway, Blackheath	Local	BH027
Macquarie's Monument	Road Reserve	Local	BH030
Station Master's House	141A Station Street, Blackheath	Local	BH067
The Gardens War Memorial	267-269 Great Western Highway, Blackheath	Local	BH123
California Bungalow	1-3 Bradley Avenue, Blackheath	Local	BH146
Community Centre	265 Great Western Highway, Blackheath	Local	BH171
Shops adjacent to Blackheath station	266 Great Western Highway, Blackheath	Local	BH173
Bungalow	6 Murri Street, Blackheath	Local	BH181
Blackheath Memorial Gardens	267-269 Great Western Highway, Blackheath	Local	BH206



Legend

- Proposal site
- Roads
- Railway
- Blue Mountains Local Environmental Plan 2015
- State Heritage Register Curtilage ID 5011931

ID	Heritage Name
BH206	Blackheath Memorial Gardens
BH181	Bungalow
BH146	California Bungalow
BH171	Community Centre
BH027	Gardners Inn
BH030	Macquarie Monument
BH173	Shops adjacent to the Station
BH067	Station Master's House
BH123	The Gardens War Memorial
BH029	Blackheath Railway Station
5011931	Blackheath Railway Station Group

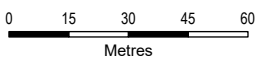


Figure 6.5 - Heritage items

Archaeological potential

Determining the significance of heritage items or a potential archaeological resource has been undertaken in accordance with the Heritage Branch, Department of Planning (NSW (now Heritage NSW, DPC) criteria publication *Assessing Significance for Historical Archaeological Sites and 'Relics'* (December 2009). Full details of the archaeological methodology are in the *Statement of Heritage Impact* (Extent Heritage, 2022).

The archaeological assessment suggested that the area within the SHR curtilage of Blackheath Station has archaeological potential within the rail corridor, specifically along the platform and adjacent to the track where former structures were located such as water tanks, water columns, a lamp room, former out-of-shed / parcels building, small goods shed and a septic tank. Potential impacts on archaeological heritage are assessed in Section 6.5.2.

Blackheath Railway Station Group

Blackheath Railway Station Group is of historical significance as part of the early construction phase of railway line duplication on the upper Blue Mountains demonstrating the technological and engineering achievements in the railway construction at the end of the 19th century.

The following statement of significance has been sourced from the State Heritage Inventory for the 'Blackheath Railway Station Group':

"Blackheath Railway Station is of state significance as part of the early construction phase of railway line duplication on the upper Blue Mountains, demonstrating the technological and engineering achievements in railway construction at the end of the 19th century. The building is significant for its contribution to the scenic qualities of the Blue Mountains railway landscape, forming part of a cohesive group of intact stations along the line. The platform building at Blackheath station is an excellent representative example of a standard Federation era railway building and is one of only two timber railway buildings along the Blue Mountains line. Partial reconstruction of the building following a fire in 1985, together with the restoration of Mortuary station, marked the beginning of heritage management in the NSW railways. The place is also significant for its local setting within well landscaped gardens and adjacent to the historic town centre.

The Blackheath Railway Station Shops have historical significance as an important and distinctive component of the precinct around Blackheath Railway Station. The buildings have some aesthetic significance as small Federation-era buildings with similarities in scale, detail, and form and are important elements in the local townscape. The buildings are also of significance for their associations with the prominent and influential identity Tomas Rodriguez, former Station Master at Blackheath Railway Station."

Different features of the Blackheath Railway Station Group have different contributions to its overall heritage significance. As part of the heritage assessment undertaken for the Proposal, features were graded in accordance with the NSW Heritage Division (NSW Heritage Office, 2001) grading criteria.

The relative heritage significance of the components of Blackheath Station has been assessed as follows.

- exceptional – station building
- high – island platform and shops

- moderate – footbridge and surrounding landscape
- little – platform landscape plantings, carpark and level crossing.

6.5.2 Potential impacts

a) Construction phase

Built heritage

Table 6.10 outlines the potential direct (physical) and indirect (visual) impacts of the Proposal upon the heritage significance. This assessment was based on the ICOMOS *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (2011).

Table 6.10 Potential construction impacts to heritage associated with the Proposal

Component	Assessment
Passenger lifts and footbridge modifications	<p>This component of the Proposal would involve the following:</p> <ul style="list-style-type: none"> • construction of three new lifts • removal of small sections of balustrade to provide access to the new lifts waiting areas • new balustrading to the footbridge extension to Lift 3 • installation of nosings and tactile ground surface indicators • an additional step at the eastern most stair • compliant handrails. <p>The footbridge modifications needed to receive the passenger lifts would be limited to non-significant heritage fabric that has been replaced since 1990.</p> <p>The Proposal has balanced the operational requirements of the Transport Access Program upgrade and the heritage values of Blackheath Railway Station. The potential impacts associated with this component of work is considered to have minor indirect (visual) and direct (physical) impacts to the heritage significance of the Blackheath Railway Station Group.</p>
Platform resurfacing	<p>This component of the Proposal would involve the following:</p> <ul style="list-style-type: none"> • replacing the platform surface materials • minor relocation of existing benches and repositioning of the existing phone booth. <p>The platform surface comprises of modern materials that are non-significant fabric that do not make a notable contribution to the aesthetic of the station.</p> <p>The potential impacts associated with this component of work is considered to have negligible indirect (visual) and direct (physical) impacts to the heritage significance of the Blackheath Railway Station Group.</p>
Modification to station building	<p>This component of the Proposal would involve the following:</p> <ul style="list-style-type: none"> • modification of the existing doorways to the waiting room and family and accessible toilet • replacement of the existing door jamb of the doorways to the waiting rooms • localised impacts to the weatherboards surrounding these doorways. <p>The potential impacts associated with this component of work is considered to have minor indirect (visual) and direct (physical) impacts to the heritage significance of the Blackheath Railway Station Group due to the nature of localised modification.</p>

Component	Assessment
Level crossing removal	<p>This component of the Proposal would involve removing the existing level crossing at the southern end of the platform to accommodate Lift 2.</p> <p>The level crossing consists of standardised, non-significant fabric dated to the 1990s. The demolition of the fabric represents a minor change to the setting and character of the station.</p> <p>The potential impacts associated with this component of work is considered to have negligible indirect (visual) and direct (physical) impacts to the heritage significance of the Blackheath Railway Station Group as it would see the removal of non-significant fabric.</p>
Kiss and ride modifications	<p>This component of the Proposal would involve the following:</p> <ul style="list-style-type: none"> • installation of new bike hoops • upgrading of the footpath and accessibility path from the kiss and ride. <p>The potential impacts associated with this component of work is considered to have negligible indirect (visual) and direct (physical) impacts to the heritage significance of the Blackheath Railway Station Group.</p>
Removal of vegetation	<p>This component of the Proposal would involve the following:</p> <ul style="list-style-type: none"> • removal of three trees and 18 shrubs • incorporation of new garden beds with sympathetic plantings. <p>Of the three trees proposed for removal, all are located in the State Heritage Register curtilage of Blackheath Railway Station Group.</p> <p>The impacts to Blackheath’s landscape values and amenity would be remediated through the replanting of twelve trees and incorporation of new garden beds into the design.</p> <p>The potential impacts associated with this component of work is considered to have minor and direct (physical) impacts to the heritage significance of the Blackheath Railway Station Group due to the retention of the significant landscape values of Blackheath Station and no impact to significant vegetation framing the station precinct.</p>

Overall, the construction of the Proposal would have **negligible** to **minor** direct (physical) and indirect (visual) impact to the heritage significance of Blackheath Railway Station Group. The Proposal is predominantly contained within the rail corridor at Blackheath Station. While the three new lifts would be visible from the public domain, they would have no direct (physical) or indirect (visual) impacts on heritage significance of heritage items within vicinity of the proposal site.

Archaeological heritage

The proposed works required for the construction of the lifts, upgrading of existing accessible paths and the car park extension are unlikely to impact on identified archaeological resources, as they are proposed in areas with limited archaeological potential of local archaeological significance.

The platform resurfacing would require the removal of the asphalt topping along the entire platform. In areas that require regrading, excavation to a depth of up to 200 millimetres would also be required. The platform surface has the potential to contain archaeological resources associated with a former out-of shed / parcels building and small goods shed. While the platform surface has been resurfaced several times, these works have the potential to impact on archaeological resources, such as structural remains or industry related artefacts.

The archaeological assessment suggests works to upgrade the informal kiss and ride area, including the installation of a new sheltered rest zone, bins, bike hoops would be in the vicinity of a former water column. The mapping indicates the item is located in the rail corridor, the proposed works in the vicinity of this item are unlikely to impact upon the archaeological resource.

The Proposal is considered to result in **low to moderate** impacts on identified archaeological resources at Blackheath Station.

b) Operational phase

The Proposal would result in new visual elements associated with the three new lifts and provision of accessible paths and ramps from the entrances of the station to the lifts. This indirect (visual) impact is not considered adverse as the Proposal has made a considered effort to reduce and mitigate the indirect (visual) impact through the consideration of bulk, height, form, materiality, detailing and colour.

Potential indirect (visual) impacts from the Great Western Highway are assessed as having **moderate** indirect (visual) impact on the views and setting of Blackheath Station. Key views and setting from Station Street would remain relatively unchanged through the retention of significant vegetation.

6.5.3 Mitigation measures

The detailed design of the proposed works must consider various heritage guidelines such as Sydney Trains *Heritage Technical Note: Installation of New Electrical and Data Services at Heritage Sites* and TfNSW *Managing Heritage in Rail Projects Urban Design Guideline*.

A heritage architect should be engaged for the detailed design process and to inform the detailed design recommendations. Specifically:

- consideration should be given to the implementation of a combination of horizontal and vertical treatments to cladding to correspond to the façade treatment of nearby buildings, notably the station building and shops along Great Western Highway
- consideration should be given to the reuse of salvaged cast iron stormwater grates currently located on the island platform
- ground disturbance associated with platform resurfacing and lift construction would be monitored by an appropriately qualified archaeologist / heritage consultant, followed by appropriate recording and reporting to ensure there are no adverse impacts to any built or archaeological resources.

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures.

6.6 Socio-economic impacts

6.6.1 Existing environment

Blackheath is a suburb located in the Blue Mountains LGA, which is a major tourism destination in NSW with many holiday homes and guest accommodation. It is located about eight kilometres north of Katoomba and west of Blue Mountains National Park.

The Proposal is located within the Blackheath town centre along the Great Western Highway. Land uses surrounding the Proposal consist of low-density residential housing, a mixture of boutique stores and cafes, and public open spaces. The closest residence is 20 metres from the Proposal, on Station Street.

Community locations and facilities located within the broader area include:

- Blackheath Library (about 50 metres east of Blackheath Station)
- Blackheath Area Neighbourhood Centre (about 80 metres east of Blackheath Station)
- Blackheath Gardens (about 70 metres north-east of Blackheath Station)
- Saint Aidan's Anglican Church (about 150 metres north-east of Blackheath Station)
- Blackheath Baptist Church (about 260 metres south-east of Blackheath Station)
- Sacred Heart Parish (about 400 metres north-east of Blackheath Station)
- Blackheath Pool (about 420 metres south-east of Blackheath Station)
- Blackheath Memorial Park (about 445 metres south-east of Blackheath Station)
- Blackheath Uniting Church (about 500 metres south-east of Blackheath Station)
- Kookaburra Kindergarten (about 500 metres south-east of Blackheath Station)
- Blackheath Public School (about 600 metres south of Blackheath Station)
- Blue Gum Montessori Preschool (about 650 metres south-east of Blackheath Station).

In 2020-21, the Blue Mountains received 2.8 million domestic overnight and daytrip visitors (Destination NSW, 2021). The largest portion of trips were for holiday purposes, followed by visits to friends and relatives and business.

A review of the 2016 Australian Bureau of Statistics (ABS) Census data was undertaken for Blackheath. Census data shows that Blackheath had a population of 4,369 people, with a median age of 51 years which is higher than the LGA (44 years).

The percentage of residents within Blackheath that reported the need for assistance as a result of a disability is consistent with the wider Blue Mountains LGA at 6.2 per cent of the population requiring assistance.

The population of Blackheath is largely dependent on private vehicles as the primary mode of travel to work with 61.7 per cent of the population being the driver or passenger. About 8.5 per cent of the population utilised public transport to travel to work, with 5.4 per cent (of the total population) utilising trains. While car usage is considered high, use of cars to work for Blackheath is similar to the NSW and Australian averages and the Blue Mountains LGA percentage of 66.8 per cent. The use of vehicles is reflected in the 88.9 per cent of the population that own at least one vehicle which is similar to the NSW average and the Blue Mountains LGA average of 90.8 per cent.

6.6.2 Potential impacts

a) Construction phase

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

- temporary changes to vehicular, bicycle and pedestrian access to, through and around the station
- temporary closures of Blackheath Station to accommodate construction work (as part of scheduled rail possession/shutdown periods)
- temporary disruptions to station facilities and amenities (e.g. seating, toilets, drinking fountain, telephone booth)
- temporary impacts to local traffic movements due to a minor increase in truck movements in the area, delivering site materials, plant and equipment

- temporary loss of 20 parking spaces at the Station Street commuter carpark during construction
- temporary impacts to the parking availability in the vicinity of Blackheath Station to accommodate for construction worker parking
- temporary construction noise, dust and visual impacts.

The above impacts on the community are expected to be relatively short term in nature. These impacts would be further reduced as many of the proposed impacts would likely occur during possession periods when movements in the vicinity of the station would be lower as a result of the trains not operating.

The Proposal would not result in any acquisition and would not result in any impacts to any adjacent land uses as works would be located on TAHE land.

b) Operational phase

The Proposal would provide positive, long term socio-economic benefits to Blackheath and the broader Blue Mountains LGA, including:

- improved accessibility for station customers and pedestrians, particularly people with a disability, limited mobility and those with prams or luggage
- improved customer amenity and facilities including, new sheltered seating and bike hoops, new accessible water bubbler, relocation of existing phone booth and widening of waiting room and family accessible toilet doors
- improved access to transport interchange facilities through new ramps and accessible paths to meet DDA requirements
- improved safety for customers on the station platform, including additional CCTV cameras, upgraded PA system, hearing loops and wayfinding signage
- potential increased use of public transport to, and from, Blackheath due to increased accessibility.

6.6.3 Mitigation measures

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

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures.

6.7 Biodiversity

This section provides a summary of the potential biodiversity impacts. This section has been informed by *Biodiversity Assessment Report* (GHD, 2022d) and *Arboricultural Impact Assessment and Tree Protection Plan* (Tree Survey, 2021).

6.7.1 Existing environment

The vegetation within the proposal site includes 38 planted trees and shrubs, and exotic grasslands, as summarised in Table 6.11 (Tree Survey, 2021).

Table 6.11 Trees and shrubs within and adjacent to the proposal site

Reference no.	Scientific name	Common name	Tree/shrub
1	<i>Pinus radiata</i> *	Radiata Pine	Tree
2, 24	<i>Quercus robur</i> *	English Oak	Tree
3, 10, 11	<i>Platanus x acerifolia</i> *	London Plane	Tree
4, 5, 7	<i>Ulmus procera</i> *	Elm	Tree
6	<i>Prunus laurocerasus</i> *	Cherry Laurel	Tree
8, 9, 17, 18, 19, 20, 21, 22, 23	<i>Rhododendron</i> sp.*	Azalea	Tree
12, 13, 14, 15	<i>Quercus palustris</i> *	Swamp Spanish Oak	Tree
16	<i>Ilex aquifolium</i> *	English Holly	Shrub
25	<i>Hakea</i> sp.	-	Shrub
26	<i>Photinia</i> sp.*	-	Shrub
27, 31	<i>Sorbus aucuparia</i> *	Roman	Shrub
28, 29, 30, 32, 33, 34, 35, 36, 37, 38	<i>Photinia</i> sp.*	-	Shrub

Note * introduced species

Vegetation within the proposal site and surrounding landscape is highly disturbed and modified (refer to Photo 6.10). The proposal site does not provide habitat connectivity to other areas of intact native vegetation in the locality.

The proposal site contains at least one species declared as priority weeds within the Greater Sydney region, Blackberry (*Rubus fruticosus*).

No threatened flora species are likely to occur within the proposal site.

No threatened fauna species or their habitats have been recorded within the proposal site. Some mobile threatened fauna species, including forest/woodland birds, forest owls, the Grey-headed Flying-fox (*Pteropus poliocephalus*) and microbat species may forage within the proposal site on occasion.



Photo 6.10 Planted exotic vegetation at Blackheath Station

6.7.2 Potential impacts

a) Construction phase

The Proposal would result in the removal of the following:

- three planted trees - one Azalea (*Rhododendron* sp.) (tree 9), one Elm tree (*Ulmus procera*) (tree 5) and one Cherry Laurel (*Prunus laurocerasus*) (tree 6)
- 18 shrubs (17 exotic and one native species).

Twelve trees and five shrubs would be retained and adequately protected during construction. Tree protection measures would vary depending on disturbance levels and would be confirmed by a suitably qualified arborist prior to works commencing.

Trees and shrubs proposed to be removed are shown on Figure 6.6.

The proposal site has limited habitat value for native plants and no threatened flora would be impacted. Any vegetation clearing required in these areas would principally remove exotic grasses, planted exotic and non-threatened native plants, and environmental weeds.

The proposed removal and disturbance of trees and understorey vegetation are unlikely to constitute habitat of importance for the persistence of any local populations of these threatened fauna species. No habitat resources including nests or hollow-bearing trees would be removed as part of the Proposal.

b) Operational phase

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

6.7.3 Mitigation measures

Construction of the Proposal must be undertaken in accordance with the Transport for NSW *Vegetation Management (Protection and Removal) Guideline* (2019d) and the Transport for NSW *Fauna Management Guideline* (2019e). Various controls for the protection of biodiversity and trees on site would be incorporated into the CEMP and implemented during construction work. Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the Arborist Assessment (Tree Survey, 2021) would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through temporary protection measures, including:

- Tree Protection Zones (TPZs) would be established around trees to be retained
- in the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Senior Environment and Sustainability Officer.

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures.



Legend

- Train station
- Proposal site
- Retain tree
- Remove tree
- Retain shrub
- Remove shrub



0 10 20 30 40
Metres

Figure 6.6 - Potential impacts on vegetation

6.8 Contamination, landform, geology and soils

A *Contamination Site Investigation* (Aurecon, 2019a) and a *Geotechnical Investigation* (Aurecon, 2019b) were carried out for the Proposal. The findings of these investigations are summarised in the following sections.

6.8.1 Existing environment

Landform soils and geology

Blackheath Station is situated on a relatively flat area surrounded by gently undulating to rolling rises and low hills on sandstone plateau surfaces. The natural topography comprises crests that are broad around 50 metres with a local relief of around 20 to 50 metres and slopes of between five to 15 per cent.

Reference to Seamless Geology Data Set, and the 1:250,000 geological map of Sydney Sheet (1966), third edition, indicates that the regional near surface geology across the site is largely occupied by Banks Wall Sandstone overlying Lambie Group Sedimentary Sandstones. This is separated by a thin layer of the Cullen Bullen subgroup of the Illawarra coal measures.

Based on the NSW Soil Landscape Maps available on the eSPADE geospatial portal, the ground surface surrounding the site is dominated by the Medlow Bath landscape. This landscape characterised by moderately deep earthy sands overlying Narrabeen Group sandstones. These have localised zones of shallow soils and rock outcrops, acid soils, very high potential for aluminium toxicity and moderate erodibility.

Outside the site area towards the plateau slopes, the soil landscape transitions to the Warragamba landscape. This is associated with steep colluvial slopes on the edges of the blue mountains plateau.

A Geotechnical Investigation (Aurecon, 2019a) of the proposal site summarised the ground conditions as comprising three generalised units:

- Unit 1 – fill: sandy gravel, gravelly sand with concrete and sandstone cobbles
- Unit 2 – residual: silty sand, dense to very dense fine to medium grained
- Unit 3 – bedrock: sandstone, extremely low to medium strength, fine to coarse grained.

Contamination

The NSW Government Acid Sulfate Soils (ASS) Risk Maps indicate that, while the area around Blackheath has not been assessed, the area surrounding the town is classified as having no known occurrence of ASS. Due to the elevation and geology of the area, acid sulphate soils is unlikely to be present at the site (Aurecon 2019a).

Based on a review of the Australian Soil Resource Information System (ASRIS) Acid Sulfate data, the site area is classed as a low risk area (Class C). This indicates the area is unlikely to exhibit any ASS.

No salinity was identified in or near the site.

Ground investigation works were undertaken in November 2019.

Based on the existing land use of the proposal site as a rail corridor and station, there is potential for contaminants to be present within underlying soils. There may be contaminated fill beneath the hardstand of the platform and within the footprint of the railway corridor. Soils underlying the railway corridor also have the potential to be impacted from previous spills or leaks.

Blackheath Station may contain contaminated materials within the fabric of the existing buildings, due to the age, including:

- asbestos
- lead paint
- polychlorinated biphenyls in light fittings
- synthetic mineral fibres.

A search of the EPA contaminated lands register in November 2021 found that there are no sites within 200 metres of the Proposal. No sites licenced under the *Protection of the Environment Operations Act 1997* are within the vicinity of the proposal site.

6.8.2 Potential impacts

a) Construction phase

Soil disturbance

The Proposal would require excavation work for the installation of foundations and footings for the new lift shafts. Other trenching or excavation may be required for footpath and ramp upgrades and relocation of services. Other activities such as resurfacing of the car park and footpaths could lead to temporary exposure of soils.

Trenching, exposure of soils and stockpiling activities, if not adequately managed, could result in the following impacts:

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

Such impacts can be a nuisance to community members and/or lead to an adverse environmental impact on water quality and biodiversity, for example through the introduction of sediment into waterways. These impacts are expected to be minor due to the limited level of ground disturbance required for the Proposal and the relatively flat topography and stability of the proposal site.

Erosion risks can be adequately managed through the implementation of mitigation measures outlined below.

Contamination

Excavation has the potential to expose contaminants, which if not appropriately managed, can present a health risk to construction workers and the community. Contaminants would also pose an environmental risk if they were to enter nearby waterways through the stormwater infrastructure. There is potential for contamination to be encountered during excavations within the rail corridor due to residues from previous spills or contaminated fill.

During construction works, there is the potential for soil to become contaminated through accidental chemical or fuel spills and leaks from construction plant and equipment. Such impacts would be managed with the implementation of mitigation measures outlined in Section 6.8.3.

Prior to works commencing on any existing buildings or structures, a hazardous materials survey for lead paint, asbestos and other potentially hazardous materials would be required.

b) Operational phase

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

6.8.3 Mitigation measures

As part of the CEMP, a site-specific erosion and sediment controls plan would be prepared and implemented in accordance with the 'Blue Book' – Managing Urban Stormwater: Soils and Construction Guidelines (Landcom, 2004). The plan would be established prior to the commencement of construction and be updated and managed throughout as relevant to the activities during the construction phase.

An environmental risk assessment is to be undertaken prior to construction and must include a section on contamination. Measures to mitigate potential impacts from any contaminated soil/materials during construction would be developed and implemented through an unexpected contamination finds procedure and Waste Management Plan as part of the CEMP.

Prior to works commencing on buildings and structures a hazardous materials survey would be completed. Remediation would be undertaken if identified contamination poses a risk to human health or the environment. All waste would be managed in accordance with relevant legislation.

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures.

6.9 Hydrology and water quality

6.9.1 Existing environment

Surface water

The site area is atop a ridge and surface water is considered likely to either infiltrate to shallow soils and groundwater or discharge as overland flows in heavy rainfall. The rail corridor has open swales on either side of the track to direct flows during heavy rainfall. The nearest surface water discharge point to the site is Popes Glenn Creek, within the Grose catchment, approximately 150 metres to the east. This then traverses through Blackheath township and into the Blue Mountains National Park (Aurecon, 2019b).

Groundwater

A review of water bores registered with the Australian Government Bureau of Meteorology (BOM) was undertaken and indicated there were two registered bores within 500 metres of Blackheath Station. Depth to groundwater in the area is unknown based on registered bores information. It is considered likely that some rainfall dependant, inter flow groundwater would be present near the top of rock and deeper groundwater the sandstone underlying the site. It should be noted that, no groundwater or inflow was observed during auguring in soil (Aurecon 2019a).

Existing water quality

The existing water quality in the Blue Mountains is relatively good with the majority of waterways in the *Blue Mountains City Council's Waterways Health Report 2019* classified as being in fair or excellent health. There is regular testing of Blue Mountains waterways with the health classification based on aquatic fauna metrics, the levels of salts, nitrogen, phosphorus and bacteria, the turbidity and the levels of dissolved oxygen.

The proposal site is within the Sydney Drinking Water Catchment and located within the Grose or Coxs catchments. The four nearest surface waters comprise the following waterway health rating according to the *Blue Mountains City Council's Waterways Health snapshot 2021*:

- Centennial Glen Creek (ID3), Coxs catchment, fair health
- Hat Hill Creek (ID24), Grose catchment, good health

- Popes Glen Creek (ID25), Grose catchment, good health
- Bridal Veil Creek/Govetts Leap Brook (ID23) Grose catchment, fair health.

Flooding

According to the flood mapping in the Blue Mountains LEP, no part of the proposal site is located within a flood prone area. No areas identified as flood prone are within the vicinity of the proposal site.

6.9.2 Potential impacts

a) Construction phase

Excavation activities during construction have the potential to impact on local waterways due to increased erosion and sedimentation from exposed soil and stockpiles. However, due to the minor extent of excavation proposed during construction and with the implementation of the mitigation measures proposed in Section 7.2, these impacts are expected to be negligible.

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

Groundwater impacts during construction are considered unlikely as no deep excavations are proposed that would encounter the groundwater table.

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

As the proposal site lies within an identified drinking water catchment, WaterNSW requires that any impacts from the Proposal must result in a neutral or beneficial effect (NoRBE) on water quality. This includes an assessment of the adequacy of the mitigation methods and safeguards to be implemented. The NorBE assessment undertaken for the Proposal (Appendix C) determined that the Proposal would have a neutral effect on water quality.

b) Operational phase

The Proposal would not involve the substantial increase in impervious surfaces that would generate additional runoff and drainage requirements, potentially impacting the hydrology of the area surrounding the station or the existing stormwater system. The existing stormwater system would continue to manage surface water around the station.

6.9.3 Mitigation measures

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

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures with respect to water quality and hydrology.

6.10 Air quality

6.10.1 Existing environment

Air quality in and around the proposal site is considered to be typical of a semi-urban setting. Air quality around the Proposal is influenced by being adjacent to a major road (Great Western Highway) and a rail corridor which is utilised by diesel services. Local air quality is also impacted by vehicles on the surrounding local network. Sensitive receivers in the vicinity of the proposal site include:

- staff and customers at Blackheath Station
- pedestrians on footpaths leading to the station entrances and adjacent to the site
- residents in the vicinity off the station
- occupants of commercial properties in the vicinity of the station.

The Department of Environment's National Pollutant Inventory was searched in November 2021, which showed no polluting facilities exist within proximity to the site.

Department of Planning and Environment undertakes air quality monitoring for five key air pollutants as well as providing an hourly and daily regional air quality index. The Blue Mountains LGA is located adjacent to the Sydney North West monitoring region with air quality monitored from four fixed sites of which Penrith is the closest monitoring location, about 40 kilometres east of Blackheath Station.

The Regional Air Quality Index (RAQI) for Sydney North West was viewed on 12 January 2022 and was generally considered to be good.

6.10.2 Potential impacts

a) Construction phase

The main air quality impacts that have the potential to occur during construction would be temporary and associated with dust particles from construction vehicle and equipment emissions and from wind blown exposed areas of soil.

Anticipated sources of dust and dust-generating activities include:

- excavation for regrading of commuter carpark, pedestrian footpaths and ramps
- excavation for the foundations and footings for the lift shaft pits
- other trenching or excavation may be required for relocation of services, drainage works and tree removal
- stockpiling activities
- dust generated from the loading and transfer of material from trucks
- other general construction works.

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

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

b) Operational phase

There are no anticipated impacts to air quality during operation as the Proposal would not generate any pollutants during operation. In addition, as the Proposal would increase access to public transport, the use of public transport would be anticipated to increase and lead to a relative reduction in the amount of private vehicle related emissions in the long-term.

6.10.3 Mitigation measures

Mitigation is aimed around maintaining and operating plant and equipment efficiently during construction and implementing measures for dust suppression including watering, covered loads and appropriate management of tracked dirt/mud on vehicles.

These measures would be included in the CEMP to be prepared for the Proposal.

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures.

6.11 Other impacts

6.11.1 Waste

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

- earthworks spoil
- green waste
- asphalt and concrete
- various building material wastes (including metals, timbers, plastics and fencing)
- electrical wiring and conduit wastes (from electrical connections)
- hazardous wastes
- general waste, including food and other wastes generated by construction workers.

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

The handling, storage, transport and disposal of asbestos and hazardous waste (including any lead waste) would be in accordance with the requirements of relevant EPA and Safe Work NSW guidelines. Waste management targets in consideration of the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2019a) would be developed for the Proposal and would include reuse and recycling.

6.12 Sustainability

The design of the Proposal would be based on the principles of sustainability, including the incorporation of the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2019a) 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. Section 6.9 discusses potential impacts relating to flooding.

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

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

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

6.14 Greenhouse gas emissions

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

The detailed design process would undertake a compliant carbon footprint exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (TfNSW, 2019f) or other approved modelling tools. The carbon footprint would be used to inform decision making in design and construction.

Due to the small scale of the Proposal and the short-term temporary nature of the individual construction work, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Table 7.1.

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

6.15 Cumulative impacts

Cumulative impacts occur when two or more projects are carried out concurrently and in 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 Blue Mountains City Council Development Application Register and the Department of Planning and Environment's Major Projects Register on 22 January 2022 identified one project in the vicinity of the Proposal:

- Great Western Highway Upgrade Blackheath to Little Harley (SSI 22004371) – upgrade to the highway expected to take around four to five years to construct. The timescale for construction has not yet been planned.

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

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

Based on this assessment, it is anticipated that the cumulative impacts would be minor/negligible, provided that consultation with relevant stakeholders and mitigation measures in Chapter 7 are implemented.

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

7 Environmental management

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

7.1 Environmental management plans

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

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

7.2 Mitigation measures

Mitigation measures for the Proposal are listed below in Table 7.1. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 7.1 Proposed mitigation measures

No.	Mitigation measure
General	
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of <i>Environmental Management Plan Guideline – Guideline for Infrastructure Projects</i> , NSW Department of Planning, Industry and Environment, 2020) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the Contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An Environmental Controls Map (ECM) would be developed by the Contractor in accordance with Transport for NSW's <i>Guide to Environmental Controls Map</i> (TfNSW, 2019g) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.
6.	Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on the ECM to avoid direct impacts during construction.
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by Transport for NSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.

No.	Mitigation measure
Traffic and site access	
8.	<p>Prior to the commencement of construction, a Traffic Management Plan (TMP) would be prepared as part of the CEMP and would include at a minimum:</p> <ul style="list-style-type: none"> • 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 and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made) • managing impacts and changes to on and off street parking and requirements for any temporary replacement provision • parking locations for construction workers away from stations and busy residential areas and details of how this will be monitored for compliance • routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses • details for relocating kiss and ride, taxi ranks and rail replacement bus stops if required, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired • measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the TMP. <p>Consultation with the relevant road authorities would be undertaken during preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction.</p>
9.	<p>Communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work.</p>
10.	<p>Road Occupancy Licences for temporary road closures would be obtained, where required.</p>
11.	<p>Relevant authorisation(s) from the appropriate road authority would be obtained for the proposed operational changes to Great Western Highway, Bundarra Street and Station Street, such as changes to intersections, parking, bus/taxi zones and signage changes.</p>
Urban design, landscape and visual amenity	
12.	<p>An Urban Design and Landscaping Plan (UDLP) is to be submitted to Transport for NSW and endorsed by the Place and Urban Design team. The Urban Design Plan is to address the fundamental design principles as outlined in 'Around the Tracks' – urban design for heavy and light rail, TfNSW, Interim 2016. The Urban Design Plan and Landscaping Plan shall:</p> <ol style="list-style-type: none"> a) demonstrate a robust understanding of the site through a comprehensive site analysis to inform the design direction, demonstrate connectivity with street networks, transport modes, active transport options, and pedestrian distances b) identify opportunities and challenges c) establish site specific principles to guide and test design options d) demonstrate how the preferred design option responds to the design principles established in 'Around the Tracks', including consideration of Crime Prevention through Environmental Design Principles.

No.	Mitigation measure
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The Urban Design Plan and Landscaping Plan is to include the Public Domain Plan for the chosen option and will provide analysis of the:

- i. landscape design approach including design of pedestrian and bicycle pathways, street furniture, interchange facilities, new planting and opportunities for public art
- ii. materials Schedule including materials and finishes for proposed built works, colour schemes, paving and lighting types for public domain, fencing and landscaping
- iii. an Artist's Impression or Photomontage to communicate the proposed changes to the precinct.

The following design guidelines are available to assist and inform the Urban Design Plan and Landscaping Plan for the Proposal:

- *TAP Urban Design Plan Guidelines* (TfNSW, Draft 2018)
- *Commuter Car Parks, Urban Design Guidelines* (TfNSW, Interim 2017)
- *Managing Heritage Issues in Rail Projects Guidelines* (TfNSW, Interim 2016)
- *Creativity Guidelines for Transport Systems* (TfNSW, Interim 2016)
- *Water Sensitive Urban Design Guidelines* for TfNSW Projects (2016)

Endorsement of the Urban Design Plan and Landscaping Plan will demonstrate compliance with the Conditions of Approval in the Determination Report.

The Urban Design Plan and Landscaping Plan shall be:

- i. prepared prior to concept design and finalised
- ii. prepared in consultation with Local Council and relevant stakeholders
- iii. prepared by a registered Architect and/or Landscape Architect.

13. 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*.

14. The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.

15. Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.

16. Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.

17. During construction, graffiti would be removed in accordance with Transport for NSW's Standard Requirements.

18. Light spill from the construction area into adjacent visually sensitive properties would be minimised by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.

Noise and vibration

19. Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (TfNSW, 2019b) and the Noise and Vibration Impact Assessment for the Proposal (GHD, 2022). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.

No.	Mitigation measure
20.	<p>The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include:</p> <ul style="list-style-type: none"> • 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.
21.	<p>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:</p> <ul style="list-style-type: none"> • maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances • using the most suitable equipment necessary for the construction work at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out-of-hours work • use of quieter and less vibration emitting construction methods where feasible and reasonable.
22.	<p>As per the <i>Construction Noise and Vibration Strategy</i> (TfNSW, 2019b), construction activities with special audible characteristics (high noise impact, intensive vibration, impulsive or tonal noise emissions) would be limited to standard hours, starting no earlier than 8am; and to continuous blocks not exceeding three hours each with a minimum respite from those activities and work of not less than one hour between each block, unless otherwise approved by Transport for NSW.</p>
23.	<p>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 undertaken 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 Senior Environment and Sustainability Officer or Manager for any work outside normal hours as per the <i>Construction Noise and Vibration Strategy</i> (TfNSW, 2019b).</p>
24.	<p>Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible. This has the potential to reduce noise levels between 5 and 10 dB.</p>

No.	Mitigation measure
25.	To avoid structural impacts as a result of vibration or direct contact with structures, the proposed work would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (GHD, 2022) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
26.	<p>Vibration resulting from construction and received at any structure outside of the project would be managed in accordance with:</p> <ul style="list-style-type: none"> • For structural damage vibration –British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings Part 2 and German Standard DIN 4150:Part 3 – 1999: Structural Vibration in Buildings: Effects on Structures. • For human exposure to vibration the acceptable vibration – values set out in the <i>Environmental Noise Management Assessing Vibration: A Technical Guideline</i> (Department of Environment and Conservation, 2006) which includes British Standard BS 6472-2:1992 <i>Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)</i>.
27.	Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory work including jack hammering and compaction for all buildings/structures/roads with a plan distance of 50 metres from the work and all heritage listed buildings and other sensitive structures within 100 metres of the work (unless otherwise determined following additional assessment they are not likely to be adversely affected).
28.	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.
29.	To effectively mitigate potential impacts of vibration on heritage structures within the station, activities that cause vibration would be managed in accordance with British Standard BS 7385-2:1993. <i>If a heritage building or structure is found to be structurally unsound (following inspection) a more conservative cosmetic damage objective of 2.5 mm/s peak component particle velocity (from DIN 4150) would be considered.</i> Real time vibration monitoring would be conducted at commencement of relevant work to confirm compliance with the adopted standard. If vibration levels approach the determined trigger level, then the construction activity would cease and the heritage structure would be assessed and alternative construction methodologies developed, where practicable, before construction.
Aboriginal heritage	
30.	All construction staff would undergo an induction in the recognition of Aboriginal cultural heritage material. This training would include information such as the importance of Aboriginal cultural heritage material and places to the Aboriginal community, as well as the legal implications of removal, disturbance and damage to any Aboriginal cultural heritage material and sites.
31.	If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in Transport for NSW's <i>Unexpected Heritage Finds Guideline</i> (TfNSW, 2019c) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and Transport for NSW Senior Environment and Sustainability Officer 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.

No.	Mitigation measure
Non-Aboriginal heritage	
32.	All staff, including design professionals and tradespeople, involved in the proposed works must receive a heritage induction prior to construction. The heritage induction would cover the significance of Blackheath Railway Station, identification of significant fabric, informing them of the location of known heritage items, mitigation measures included in this report, and guidelines to follow if unanticipated heritage items or deposits are located during construction.
33.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in Transport for NSW's <i>Unexpected Heritage Finds Guideline</i> (TfNSW, 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 Senior Environment and Sustainability Officer so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and Heritage NSW. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to work recommencing at the location.
34.	A section 60 approval under the <i>Heritage Act 1977</i> would be obtained from the NSW Heritage Council (or delegate) prior to the commencement of construction and the conditions of the approval must be implemented.
35.	As Blackheath Station is locally listed on the heritage schedule of the Blue Mountains LEP. Blue Mountains City Council would be notified of the proposed work prior to construction commencing.
36.	A suitably qualified and experienced heritage architect who is independent of the design and construction team's personnel would be engaged to provide ongoing heritage, design and conservation advice throughout detailed design and any subsequent relevant design modifications.
37.	A Photographic Archival Recording (PAR) is to be undertaken of Blackheath Station, its setting, context and significant views, prior to the commencement of construction and following completion of works. This recording must be in accordance with the NSW Heritage Division guidelines <i>Photographic recording of heritage items using film or digital capture</i> (NSW Heritage Office, 2006) and <i>How to prepare archival records</i> (NSW Heritage Office, 1998). Digital copies would be provided to the Heritage NSW, Blue Mountains City Council and Sydney Trains for future reference.
38.	A Heritage Management Plan (including detailed drawings, documentation and specifications) and Work Method Statement would be prepared as part of the CEMP to address heritage impacts and required management procedures to minimise risks.
39.	During construction, suitable measures would be put in place to ensure the retained heritage elements are protected from damage. Measures may include hoardings, use of spotters during the movement of equipment and other measures as necessary.
40.	To effectively mitigate potential impacts of vibration on the station building, activities that cause vibration would be managed in accordance with German Standard DIN 4150 – Part 3 (DIN 1999) heritage specifications. Real time vibration monitoring would be conducted at commencement of relevant work to confirm compliance with the German Standard DIN 4150. If vibration levels approach the determined trigger level, then the construction activity would cease and the heritage structure would be assessed and alternative construction methodologies developed, where practicable, before construction recommences.
41.	On completion of work, an update would be prepared for the State Heritage Register with required details.

No.	Mitigation measure
42.	Ground disturbance associated with platform resurfacing and lift construction would be monitored by an appropriately qualified archaeologist / heritage consultant, followed by appropriate recording and reporting to ensure there are no adverse impacts to any built or archaeological resources.
43.	On completion of the monitoring works, a monitoring report should be prepared to present the findings of the project work and identify any recommendation for future management, where relevant. The monitoring report should be prepared within six months of the completion of onsite monitoring.
44.	A Heritage Interpretation Plan (HIP) for Blackheath Station would be prepared and implemented in accordance with the Sydney Trains Draft Heritage Interpretation Guideline (July, 2018). The HIP should build on the recommendations made in the Blackheath Station heritage interpretation strategy, prepared by Artefact Heritage (2021).
Socio-economic	
45.	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.
46.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
47.	A Community Liaison Plan would be prepared prior to construction to identify all potential stakeholders and best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
48.	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.
49.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed prior to construction.
Biodiversity	
50.	Construction of the Proposal must be undertaken in accordance with Transport for NSW's <i>Vegetation Management (Protection and Removal) Guideline</i> (TfNSW, 2019d) and Transport for NSW's <i>Fauna Management Guideline</i> (TfNSW, 2019e).
51.	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.
52.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the Arborist Assessment (Tree Survey, 2021) would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through temporary protection measures discussed below.
53.	TPZs would be established around trees to be retained, as nominated in the Arborist Assessment (Tree Survey, 2021). Tree protection would be undertaken in line with <i>AS 4970-2009 Protection of Trees on Development Sites</i> and would include exclusion fencing of TPZs.
54.	Where the loss of trees is unable to be mitigated, Transport for NSW would replace trees removed as a result of the project in accordance with the Transport for NSW's <i>Vegetation Offset Guide</i> (2019h).

No.	Mitigation measure
55.	In the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Senior Environment and Sustainability Officer to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
56.	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 TfNSW's Tree Removal Application Form and submit it to TfNSW for approval.
57.	For new landscaping work, mulching and watering would be undertaken until plants are established.
58.	Weed control measures, consistent with Transport for NSW's <i>Weed Management and Disposal Guideline</i> (TfNSW, 2019i), 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 <i>Biosecurity Act 2015</i> .
Soils and water	
59.	Prior to commencement of work, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' <i>Managing Urban Stormwater: Soils and Construction Guidelines</i> (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of work and maintained throughout construction.
60.	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.
61.	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.
62.	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 <i>Chemical Storage and Spill Response Guidelines</i> (TfNSW, 2019j).
63.	Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the Transport for NSW <i>Chemical Storage and Spill Response Guidelines</i> (TfNSW, 2019j) 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.
64.	In the event of a pollution incident, work would cease in the immediate vicinity and the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Senior Environment and Sustainability Officer. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the POEO Act.
65.	The existing drainage systems would remain operational throughout the construction phase.
66.	Should groundwater be encountered during excavation work, groundwater would be managed in accordance with the requirements of the <i>Waste Classification Guidelines</i> (EPA, 2014) and Transport for NSW's <i>Water Discharge and Reuse Guideline</i> (TfNSW, 2019k).

No.	Mitigation measure
Air quality	
67.	Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's <i>Air Quality Management Guideline</i> (TfNSW, 2019l).
68.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
69.	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.
70.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
71.	To minimise the generation of dust from construction activities, the following measures would be implemented: <ul style="list-style-type: none"> • apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) • cover stockpiles when not in use • appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading • prevent mud and dirt being tracked onto sealed road surfaces.
Waste and contamination	
72.	The CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum: <ul style="list-style-type: none"> • 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.
73.	An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with WorkCover requirements.
74.	All excavated spoil suitable for reuse would be reused on site and distributed as agreed with Transport for NSW and the Contractor. The reuse of excavated material would be further reviewed and confirmed during construction.
75.	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.
76.	All spoil and waste must be classified in accordance with the <i>Waste Classification Guidelines Part 1: Classifying waste</i> (EPA, 2014) prior to disposal.
77.	Any concrete washout would be established and maintained in accordance with Transport for NSW's <i>Concrete Washout Guideline</i> – draft (TfNSW, 2019m) with details included in the CEMP and location marked on the ECM.

No.	Mitigation measure
Sustainability, climate change and greenhouse gases	
78.	Detailed design of the Proposal would be undertaken in accordance with the <i>NSW Sustainable Design Guidelines – Version 4.0</i> (TfNSW, 2019a).
79.	The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's <i>Carbon Estimate and Reporting Tool Manual</i> (Transport for NSW, 2019f) or other approved modelling tools. The carbon footprint would be used to inform decision making in design and construction.
Cumulative impacts	
80.	The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed in the CEMP and implemented as appropriate.

8 Conclusion

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

The Proposal would provide the following benefits:

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

The likely key impacts of the Proposal are as follows:

- temporary adverse impacts to the visual amenity of the local environment due to the construction works associated with the Proposal
- temporary minor impacts on local traffic flow associated with construction traffic along the Great Western Highway, Bundarra Street and Station Street
- adverse impact to the local community through temporary disruptions to station facilities and amenities during construction, including potential weekend closures of Blackheath Station during scheduled Sydney Trains rail shutdowns
- temporary adverse impacts to the local community through changes to vehicular, bus and pedestrian access around the station during construction
- temporary loss of up to 20 parking spaces in the commuter car park during some construction activities resulting in station customers needing to find parking further from the station
- temporary highly affected noise impacts to adjacent residential areas during construction, including periods of weekend works
- potential sediment mobilisation, dust generation and erosion risk during construction
- removal of three trees and some plantings
- visual impacts to sensitive receivers during operation, including the introduction of new elements, such as lifts and ramps into the visual environment.

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

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

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Appendix A Consideration of matters of National Environmental Significance

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

Matters of NES	Impacts
<p>Any impact on a World Heritage property? No World Heritage properties occur within a one-kilometre radius of the proposal site.</p>	Nil
<p>Any impact on a National Heritage place? No National Heritage Places occur within a one-kilometre radius of the proposal site.</p>	Nil
<p>Any impact on a wetland of international importance? No wetlands of international importance are located within a one-kilometre radius of the proposal site.</p>	Nil
<p>Any impact on a listed threatened species or communities? It is unlikely that the Proposal would significantly impact on any listed threatened species or communities as none were identified within the proposal site.</p>	Nil
<p>Any impacts on listed migratory species? It is unlikely that the Proposal would significantly impact any listed migratory species.</p>	Nil
<p>Does the Proposal involve a nuclear action (including uranium mining)? The Proposal does not involve a nuclear action.</p>	Nil
<p>Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the vicinity of the Proposal.</p>	Nil
<p>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.</p>	Nil
<p>Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be undertaken on or near any Commonwealth land.</p>	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
<p>(a) Any environmental impact on a community?</p> <p>There would be some temporary impacts to the community during construction, particularly in relation to noise, traffic and access and visual amenity. Mitigation measures outlined in Section 7.2 would be implemented to manage and minimise adverse impacts.</p>	Minor
<p>(b) Any transformation of a locality?</p> <p>The Proposal would include the introduction of new visible elements in the landscape (including a new lift and ramps). The appearance of the new elements would be consistent with the existing station elements and are considered to be common features in urban areas.</p> <p>The Proposal would have a positive contribution to the locality by creating accessible entrances to the station and station platforms.</p>	Minor
<p>(c) Any environmental impact on the ecosystem of the locality?</p> <p>The Proposal would require minor vegetation removal. However, given the Proposal's location within an urbanised environment and the low habitat value of the trees to be removed, impacts to biodiversity and ecosystems are expected to be minor.</p>	Minor
<p>(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</p> <p>There would be some temporary impacts during construction particularly in relation to noise, traffic and access and visual amenity.</p> <p>The Proposal would not result in any substantial reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.</p>	Minor
<p>(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?</p> <p>Blackheath Railway Station is listed on the State Heritage Register (Item No: 5011931). The Proposal would retain the overall heritage value of the existing station and have a positive contribution to the locality by creating equitable access to the station and the platform.</p> <p>A desktop archaeological assessment has been undertaken which determined that there is potential of encountering archaeological remains during construction of the Proposal.</p>	Minor
<p>(f) Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)?</p> <p>The Proposal is unlikely to have any impact on the habitat of protected fauna.</p>	Nil
<p>(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</p> <p>The Proposal is unlikely endanger any species of animal, plant or other form of life, whether living on land, in water or in the air.</p>	Nil
<p>(h) Any long-term effects on the environment?</p> <p>The Proposal is unlikely to have any long-term effects on the environment.</p>	Nil

Factor	Impacts
<p>(i) Any degradation of the quality of the environment? The Proposal is unlikely to have any degradation on the quality of the environment.</p>	Nil
<p>(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.</p>	Nil
<p>(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.</p>	Nil
<p>(l) Any pollution of the environment? The Proposal is unlikely to cause any pollution of the environment provided the recommended mitigation measures are implemented as outlined in Section 7.2.</p>	Nil
<p>(m) Any environmental problems associated with the disposal of waste? The Proposal is unlikely to cause any environmental problems associated with the disposal of waste. Hazardous waste and special waste may be generated from the Proposal. Prior to construction, contamination investigations would be undertaken to confirm the presence of contaminated material, particularly asbestos. All waste would be managed and disposed of with a site-specific Waste Management Plan prepared as part of the Construction Environmental Management Plan. Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.</p>	Nil
<p>(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.</p>	Nil
<p>(o) Any cumulative environmental effect with other existing or likely future activities? Cumulative effects of the Proposal are described in Section 6.15. 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.</p>	Nil
<p>(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.</p>	Nil

Appendix C Neutral or Beneficial Effect Assessment

As required by Clause 12 of the State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011, the table below outlines the Neutral or Beneficial Effect Assessment for the Proposal to be undertaken by public authorities and that is being assessed under Division 5.1 of the EP&A Act.

Criteria	Assessment
1. Are there any identifiable potential impacts on water quality? What pollutants are likely? Major potential pollutants are sediments (fine and coarse), nitrogen, phosphorus, pathogens and hazardous chemicals and contaminants such as oil/fuel. During construction and/or post construction?	<p>During construction there is potential for:</p> <ul style="list-style-type: none"> • sediment from excavations and stockpiles to enter waterways through nearby drains • oil spills from operation of equipment/machinery. <p>A site-specific Erosion and Sediment Control Plan would be prepared and implemented for the Proposal to manage risks to water quality. Refer to Table 7.1 for a full list of proposed mitigation measures with respect to water quality and hydrology.</p> <p>There would be no operational risks to water quality.</p>
2. For each pollutant list the safeguards needed to prevent or mitigate potential impacts on water quality (these may be SCA endorsed current recommended practices and/or equally effective other practices)?	<p>Excavation works for the Proposal are minor and the risks to water quality have been assessed as low provided the mitigation measures identified in this REF are followed (refer to Section 6.8 and Section 6.9).</p> <p>Erosion and Sediment Control Plan/s would be prepared for the Proposal that would specify controls consistent with the 'Blue Book' <i>Managing Urban Stormwater, Soils and Construction</i> (Landcom, 2004). Dewatering would be undertaken in accordance with TfNSW procedures.</p> <p>Refuelling of equipment and maintenance would take place away from drains and spill kits would be available on site. These mitigation measures are to be included in the CEMP for the Proposal.</p>
3. Will the safeguards be adequate for the time required? How will they need to be maintained?	<p>Erosion and sedimentation controls would be established prior to commencement of works and would be maintained throughout the construction period.</p>
4. Will all impacts on water quality be effectively contained on the site by the identified safeguards (above) and not reach any watercourse, waterbody or drainage depression? Or will impacts on water quality be transferred outside the site for treatment? How? Why?	<p>It is considered that the proposed mitigation measures prescribed in this REF would be adequate to prevent impacts to other water bodies or water courses.</p>
5. Is it likely that a neutral or beneficial effect on water quality will occur? Why?	<p>The Proposal would have a neutral effect on water quality. The risks to water quality from the construction of the Proposal would be managed through the implementation of the soil and water mitigation measures contained in the CEMP.</p>