NSW GOVERNMENT

Transport Access Program

Faulconbridge Station Upgrade

Review of Environmental Factors

Artist's impression of the proposed Faulconbridge Station Upgrade, subject to change during detailed design.

October 2019

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Abbreviations

Term	Meaning
AHIMS	Aboriginal Heritage Information Management System
AS	Australian Standard
ASA	Asset Standards Authority (refer to Definitions)
ASS	Acid Sulfate Soils
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BMCC	Blue Mountains City Council
BS	British Standard
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CCTV	Closed Circuit Television
CLM Act	*Contaminated Land Management Act 1997* (NSW)
CLMP	Community Liaison Management Plan
CM Act	*Coastal Management Act 2016* (NSW)
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
D&C	Design & Construct
DBH	Diameter Breast Height
DDA	*Disability Discrimination Act 1992* (Cwlth)
DoEE	Commonwealth Department of the Environment and Energy
DP&E	NSW Department of Planning and Environment
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
ECM	Environmental Controls Map
EES	Environment, Energy and Science
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009).
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)

Term	Meaning
IS rating	Infrastructure Sustainability rating under ISCA rating tool (v 1.2)
ISCA	Infrastructure Sustainability Council of Australia
LEP	Local Environmental Plan
LGA	Local Government Area
MCA	Multi-criteria analysis
NES	National Environmental Significance (refers to matters of National Environmental Significance under the EPBC Act)
NorBE	Neutral or Beneficial Effect
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
PDP	Public Domain Plan
PoEO Act	*Protection of the Environment Operations Act 1997* (NSW)
REF	Review of Environmental Factors (this document)
Roads Act	*Roads Act 1993* (NSW)
Roads and Maritime	NSW Roads and Maritime Services
SEPP	State Environmental Planning Policy
SoHI	Statement of Heritage Impact
SHI	State Heritage Inventory
SHR	State Heritage Register
SREP	Sydney Regional Environmental Plan
SW Act	*Sydney Water Act 1994* (NSW)
TfNSW	Transport for NSW
TGSI	Tactile ground surface indicators
TPZ	Tree Protection Zone
UDP	Urban Design Plan
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
WM Act	*Water Management Act 2000* (NSW)
JAMBA	*Japan Australian Migratory Bird Agreement*
CAMBA	*China Australia Migratory Bird Agreement*
RoKAMBA	*Republic of Korea Australia Migratory Bird Agreement*

Definitions

Term	Meaning
Asset Standards Authority	The ASA is an independent body within TfNSW, responsible for engineering governance, assurance of design safety, and ensuring the integrity of transport and infrastructure assets.
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 Average Recurrence Interval flood would occur on average once every 100-years.
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the Construction Contractor (should the Proposal proceed) to a design suitable for construction (subject to TfNSW acceptance).
Construction Contractor	The entity appointed by TfNSW to undertake the construction of the Proposal. The Construction Contractor is therefore responsible for all work on the project, both design and construction.
Determining authority	A Minister or public authority on whose behalf an activity is to be carried out or public authority whose approval is required to carry out an activity (under Division 5.1 of the EP&A Act).
Disability Standards for Accessible Public Transport	The Commonwealth Disability Standards for Accessible Public Transport 2002 (as amended), authorised under the Commonwealth *Disability Discrimination Act 1992* (DDA).
Ecologically Sustainable Development	As defined by clause 7(4) Schedule 2 of the EP&A Regulation.
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.
Out of hours works	Defined as works undertaken *outside* standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act.
Proposal	The construction and operation of the Faulconbridge Station Upgrade.
Rail possession / shutdown	Shutdown is the term used by railway building/maintenance contractors to indicate that they have taken possession of the track (usually a section of track) for a specified period, where no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
Vegetation Offset Guide (TfNSW, 2016b)	The TfNSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of Section 5.5 of the EP&A Act.

Executive summary

Overview

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

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

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

The Proposal would aim to provide:

- two lifts, one connecting the existing footbridge to the station platform and another one connecting the existing footbridge to the Great Western Highway
- an upgrade to the two existing accessible car parking spaces and the kiss and ride bay
- a new pedestrian rest area
- improved amenities such as a new family accessible toilet and an ambulant toilet.

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 in mid-2020 and take approximately 12 – 18 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF, while an overview of the Proposal is shown in Figure ES.1 and ES.2 below.

Further details of each of the elements of the Proposal is provided in Chapter 3 of this REF.

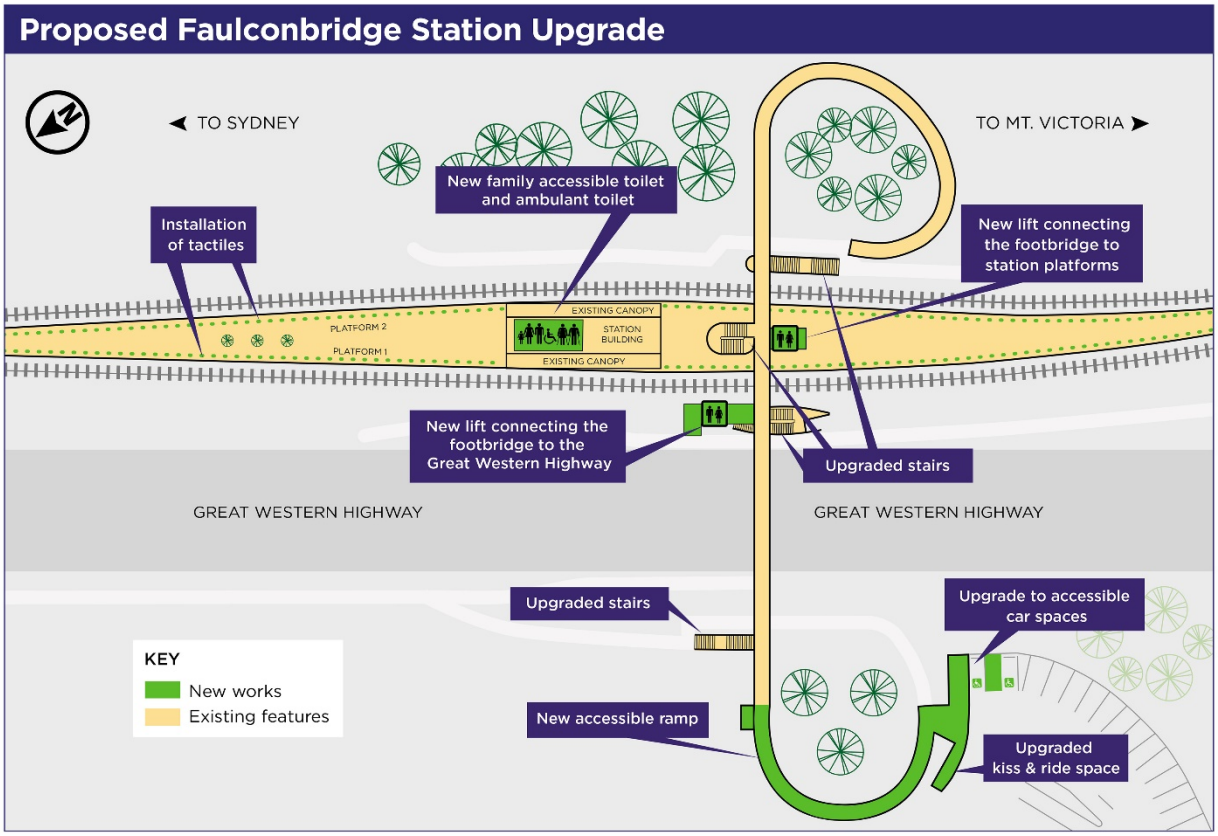

Figure ES.1 Key features of the Proposal

Figure ES.2 Photomontage of the Proposal (subject to detailed design)

Need for the Proposal

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

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

Community and stakeholder consultation

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

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

In accordance with the requirements of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP), consultation is required with local councils and/or public authorities in certain circumstances, including where council managed infrastructure is affected. Consultation has been undertaken with Blue Mountains City Council/other stakeholders during the development of design options and the preferred option. Consultation with Blue Mountains City Council occurred on 8 August 2019. Consultation with these stakeholders would continue through the detailed design and construction of the Proposal.

Feedback can be sent to:

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

Or submitted:

- **in person at a project community information session**
- **via yoursay.transport.nsw.gov.au/faulconbridge**

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

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

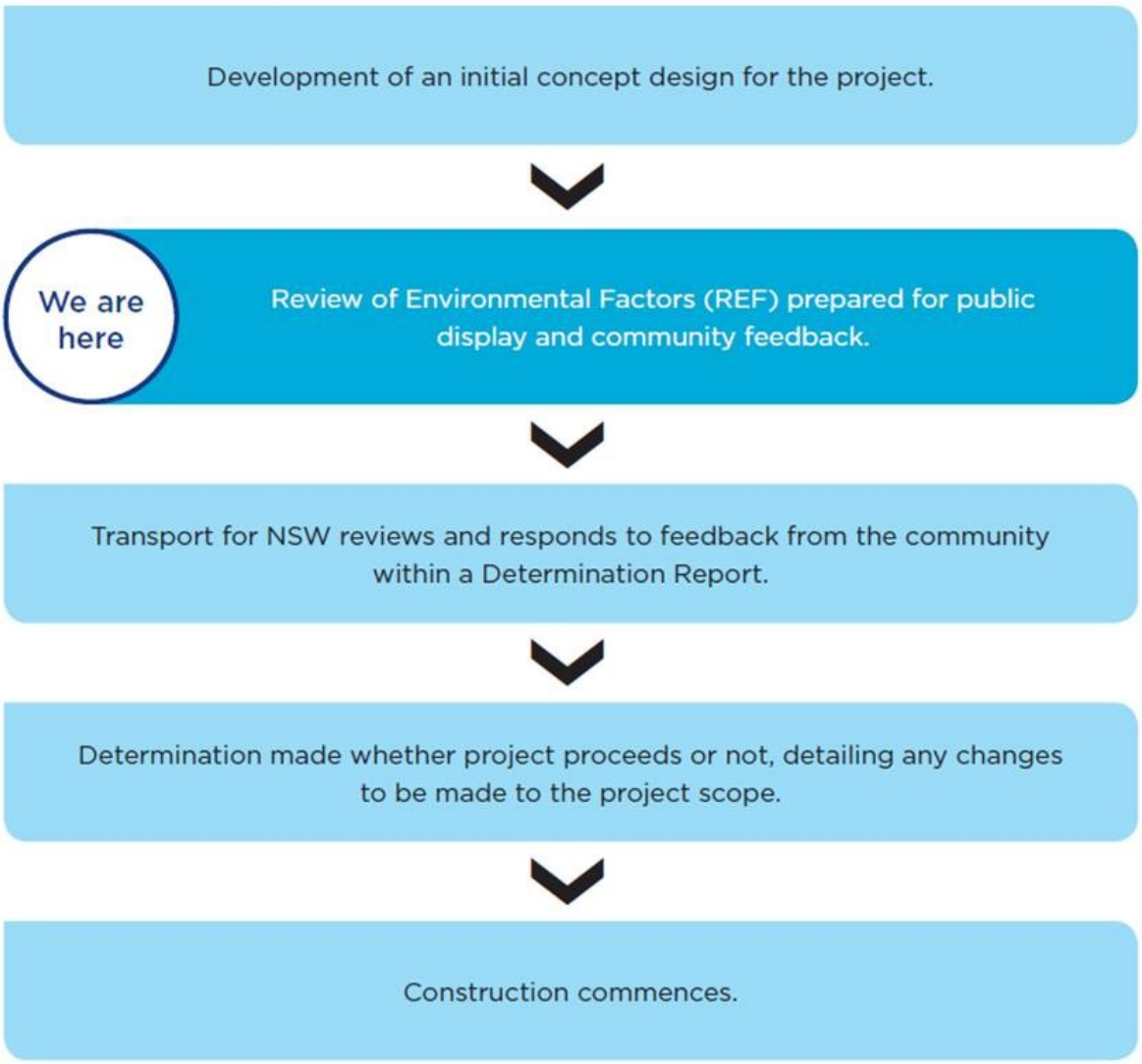

Figure ES.3 Planning approval and consultation process for the Proposal

Environmental impact assessment

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

The Proposal would provide the following benefits:

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

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

- moderate adverse visual impacts from views north and south of the station platform due to works from the lift, stairs and construction activities
- noise impacts assessed from construction activities
- temporary disruptions to station facilities and amenities during construction
- minor direct and indirect (visual) heritage impacts on heritage fabric of the existing station building from the introduction of new elements, such as the lifts
- temporary changes to vehicular, bus, bicycle and pedestrian access to, through and movements around the station during construction
- removal of approximately 11 trees to accommodate construction works related to lift installation and footpath grading
- potential sediment mobilisation, dust generation, erosion risk and hazards risk during construction.

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

Conclusion

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

The detailed design of the Proposal would also be designed in accordance with the ISCA rating tool (v 1.2) taking into account the principles of ecologically sustainable development (ESD).

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

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

1. Introduction

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

1.1. Overview of the Proposal

1.1.1. Need for the Proposal

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

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

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

Non-compliant access points, paths and stairs to Faulconbridge Station platforms do not facilitate equal access for people with reduced mobility, a disability, parents/carers with prams, or customers with luggage. There are no lift facilities and inadequate tactile ground surface indicators (TGSI's) to stairs and platforms.

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

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

1.1.2. Key features

The key features of the Proposal are:

- construction of a new lift connecting the existing footbridge to the station platforms
- construction of a new lift connecting the footbridge to the Great Western Highway
- internal station building works including:
    - reconfiguration of the existing station waiting room including door widening and the provision of allocated wheelchair spaces
    - reconfiguration of the existing toilets to accommodate one new unisex family accessible toilet and one new unisex ambulant toilet
- modifications to the commuter car park
- construction of a new DSAPT compliant ramp from the existing footbridge to the commuter car park.

Subject to planning approval, construction is expected to commence in mid-2020 and take around 12 – 18 months to complete.

Figure 1.1 shows key features of the Proposal and a detailed description of the Proposal is provided in Chapter 3.

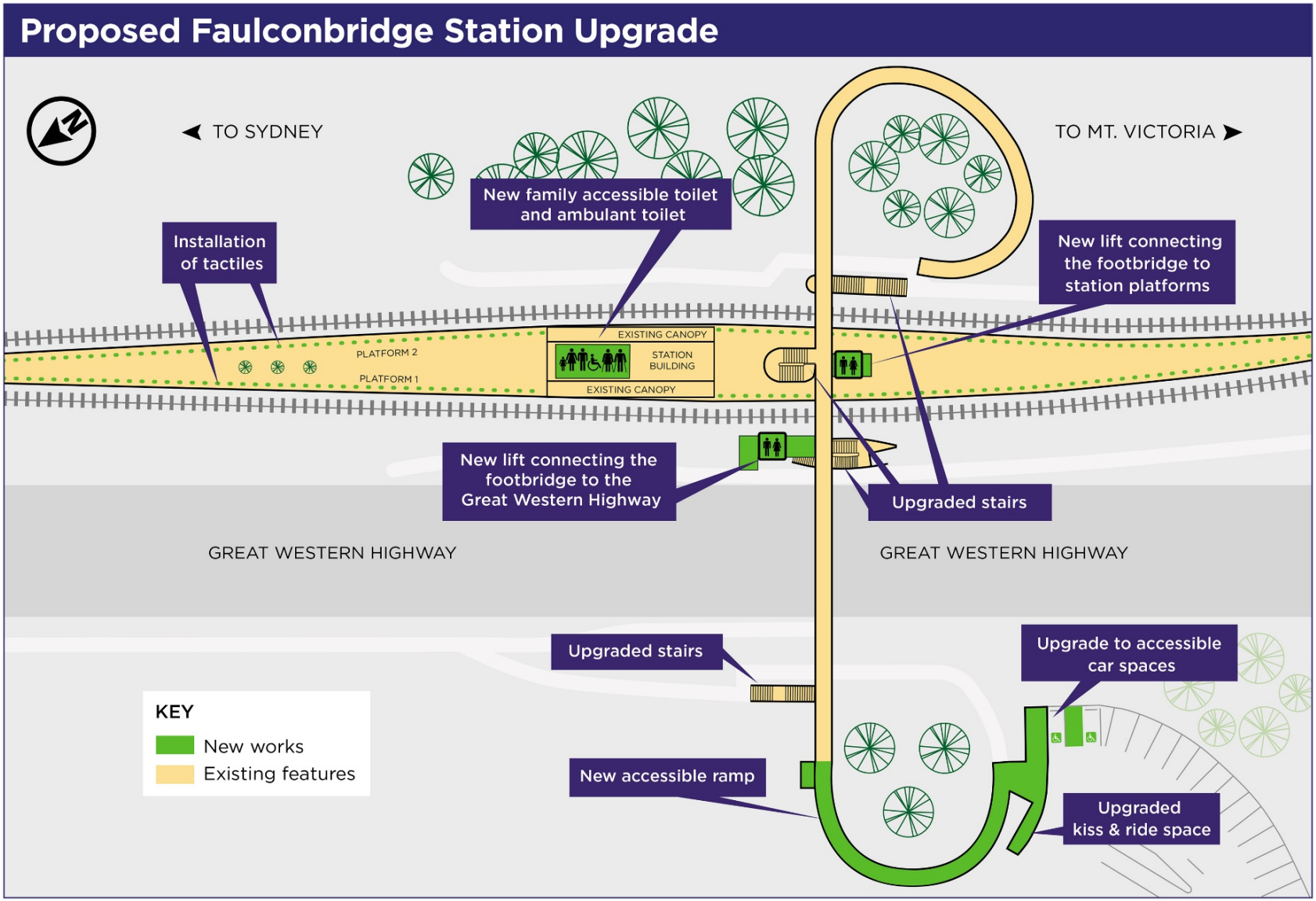

Figure 1.1 Key features of the Proposal

1.2. Location of the Proposal

The Proposal is located in the suburb of Faulconbridge in the Blue Mountains City Council local government area (LGA) located approximately 83 kilometres from Central Station.

The Proposal area is generally bounded by Railway Avenue to the south and Sir Henrys Parade to the east. The area around Faulconbridge Station consists mostly of low density residential and recreational land uses as well as major transport infrastructure (Great Western Highway).

Faulconbridge Station is located on the Blue Mountains Line providing intercity and local connections. Platform 1 provides train services northbound towards Central Station, Sydney and Platform 2 provides train services southbound towards Bathurst.

The Proposal would mostly be located within the confines of the existing station, and would include the existing footbridge and commuter car park at Railway Avenue on the western side of the station.

Existing ownership of Faulconbridge station infrastructure includes the following:

- the station is within rail corridor on Railcorp land
- the footbridge is an RMS asset and sits within the Great Western Highway road reserve (including the western ramp)
- the car park is on council land.

The regional location of the Proposal is shown in Figure 1.2.

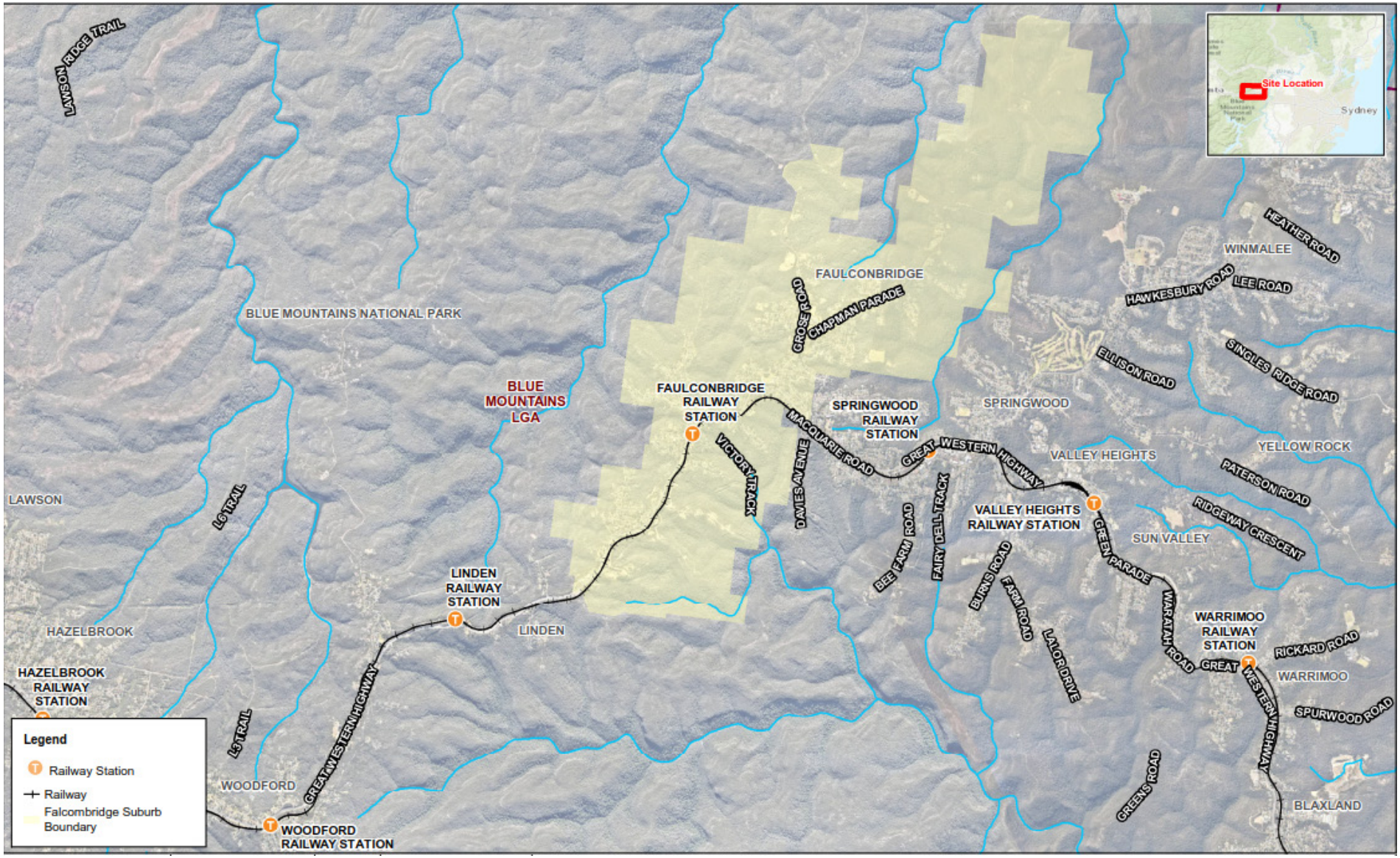

Figure 1.2 Regional context

1.3. Existing infrastructure and land uses

1.3.1. Station access and facilities

Faulconbridge Station consists of a single island platform which is accessed via a set of stairs to a footbridge.

Access to the footbridge is provided at three points.

- the eastern entrance is via Sir Henrys Parade or the informal car parking area via a circular ramp or stairs
- the middle entrance is via the existing pedestrian, cyclist and bus networks on the eastern side of the Great Western Highway via stairs
- the western entrance is via the commuter car park on Railway Avenue and the pedestrian and bus network on the western side of the Great Western Highway. Commuters can either access the footbridge via stairs to the north of the footbridge or an access path from the car park.

A station building is located within the centre of the platform and contains a number of facilities including male and female toilets, Station Master's Office and waiting room. The station building has a canopy to provide customers with weather protection for seating, telephone booth, help points and drinking fountain; an opal card reader is also located on the platform.

1.3.2. Interchange facilities

There are two parking areas at Faulconbridge Station. A commuter car park owned by the Blue Mountains City Council is located on the western side of Faulconbridge Station. This car park is accessed via Railway Avenue and includes two accessible parking spaces and a kiss and ride bay. An informal, unsealed open space area which is used as a car park is located on the eastern side of the station on Blue Mountains City Council land and is accessed via Sir Henrys Parade. On the southern side of Sir Henrys Parade, there's an informal open space area.

Two bus stops are located near Faulconbridge Station.

- the nearest bus stop (Stop ID: 277615) is located on the eastern side of the Great Western Highway about 45 metres from platform access and provides services to Springwood Station and to Katoomba
- the second bus stop (Stop ID: 277621) is located on the western side of the Great Western Highway about 100 metres from platform access and provides services to Springwood Station.

There is a cyclist path on the eastern side of Great Western Highway. No bike racks are currently provided on either side of the station.

The site location of Faulconbridge Station is shown in Figure 1.3. Photos of the existing infrastructure are shown in Figure 1.4 to Figure 1.8.

Figure 1.3 Site locality map

Figure 1.4 View looking south from the northern end of platform

Figure 1.5 View looking north from the southern end of the platform (existing footbridge in the centre of the photo)

Figure 1.6 View looking south from Great Western Highway

Figure 1.7 View looking north from Great Western Highway

Figure 1.8 Access path from the existing station car park to footbridge

1.4. Purpose of this Review of Environmental Factors

This REF has been prepared by TfNSW to assess the potential impacts of the Faulconbridge Station Upgrade. For the purposes of these works, TfNSW 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 the Environment and Energy 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 Faulconbridge Station Upgrade, the subject of this REF, forms part of the Transport Access Program. This program is designed to drive a stronger customer experience outcome to deliver seamless travel to and between transport modes, encourage greater public transport use and better integrate station interchanges with the role and function of town centres and developing urban centres in regional areas of NSW.

Table 2.1 identifies key NSW government policies applicable to the Proposal as part of the strategic justification. Further details of the application of NSW Government policies and strategies are discussed in Chapter 4 of this REF.

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

Policy / Strategy	Overview	How the Proposal aligns
Future Transport Strategy 2056 (TfNSW, 2018)	*Future Transport 2056* is an update of *NSW's Long Term Transport Master Plan.* It is a suite of strategies and plans for transport to provide an integrated vision for the state. *Future Transport 2056* identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport.	The Proposal 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. New lifts, a new ramp and accessible paths included in the Proposal would allow people with mobility constraints to access public transport. Greater accessibility would also mean better connections to places and opportunities for employment, education, business and leisure. The Proposal has also considered increased patronage in design development to accommodate the forecast Sydney Trains patronage growth and changing travel patterns.
Disability Inclusion Action Plan 2018-2022 *(TfNSW, 2017)*	The *Disability Inclusion Action Plan 2018-2022* was developed by TfNSW in consultation with the Accessible Transport Advisory Committee, which is made up of up of representatives from peak disability and ageing organisations within NSW. The Disability Plan discusses the challenges, the achievements to date, the considerable undertaking that is required to finish the job, and provides a solid and practical foundation for future progress over the next five years.	The Proposal has been developed with consideration of the objectives outlined in this Plan and seeks to improve and provide equitable access to public transport facilities.
NSW State Infrastructure Strategy 2018-2038 *(NSW Government, 2018)*	The *NSW State Infrastructure Strategy 2018–2038* builds on the NSW Government's major long-term infrastructure plans over the last seven years. The strategy sets out the government's priorities for the next 20 years, and combined with the *Future Transport Strategy 2056*, the *Greater Sydney Region Plan* and the *Regional Development Framework*, brings together infrastructure investment and land-use planning for our cities and regions. Public transport is viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal.	The Proposal supports investment in rail infrastructure, and aligns with the need to continue to provide urban public transport to support Sydney's increasing population. The Proposal is also consistent with overall aims and objectives of the *Future Transport Strategy 2056* to improve transport infrastructure across NSW.

Policy / Strategy	Overview	How the Proposal aligns
Western District Plan (Greater Sydney Commission, 2018a)	The *Western City District Plan* is a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year vision for Greater Sydney. It helps guide the implementation of Greater Sydney Region Plan, A Metropolis of Three Cities, at a district level and is a bridge between regional and local planning.	The Proposal is located within the Western District as part of the Blue Mountains. The Proposal would assist in meeting the Planning Priorities of providing services and social infrastructure to meet people's changing needs as it would increase the accessibility of places and transport, ensuring people with disability can easily access services. As well as aligning with enhanced productivity as a well-connected city as the Proposal develops a more accessible and walkable city.
NSW: Making It Happen *(NSW Government, 2015)*	In September 2015, the NSW Government announced a series of State Priorities as part of *NSW: Making It Happen* (NSW Government, 2015). The State Priorities are intended to guide the ongoing actions of the NSW Government across the State, and guide resource allocation and investment in conjunction with the NSW Budget. *NSW: Making it Happen* focuses on 12 key 'priorities' to achieve the NSW Government's commitments. These priorities range across a number of issues including infrastructure, the environment, education, health, wellbeing and safety in addition to Government services. One of the 12 priorities identified as part of NSW: Making It Happen relates to investment in building infrastructure. The ongoing development and investment in transport infrastructure is identified as part of the wider building infrastructure priority.	The Proposal would assist in meeting the priority to develop and invest in transport infrastructure by improving accessibility to, and encouraging greater usage of, public transport.
Disability Inclusion Action Plan 2017 – 2021 *(Blue Mountains City Council, 2017)*	The *Disability Inclusion Action Plan 2017 – 2021* identifies actions to ensure Council's services, facilities, programs and information are inclusive for all members of the community. Focus areas of the Plan are: • liveable communities • systems and processes • access to meaningful employment • attitudes and behaviours	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.

2.2. Objectives of the Transport Access Program

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

- stations that are accessible to people with disabilities, limited mobility, parents/carers with prams, and customers with luggage
- modern buildings and facilities for all transport modes that meet the needs of a growing population
- modern interchanges that support an integrated network and allow seamless transfers between all transport modes for all customers
- safety improvements including extra lighting, help points, lift alarm, fences and security measures for car parks and interchanges, including stations, bus stops and wharves
- signage improvements so customers can 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 Faulconbridge Station Upgrade are to:

- provide a station that is accessible to customers with a disability, limited mobility, parents/carers with prams and customers with luggage
- improve customer experience by improving accessibility for people with mobility issues (including increased access to station facilities such as the toilets, waiting room, drinking fountain, telephone booth and accessible parking spaces)
- improve pedestrian connectivity between commuter car park, station and bus stops
- reduce potential pedestrian conflict and crowding points along the platform
- improve integration with surrounding precinct
- improve customer safety
- improve wayfinding in and around the station
- respond to the heritage values of the site
- improve customer amenity.

2.3.1. Design development

The need for an upgrade was identified as the station does not currently meet the DDA or requirements of DSAPT. In 2018, Stantec was engaged to prepare a *Scoping Design Report* (Stantec, 2018). The report identified the following key access constraints and issues at Faulconbridge Station:

- access to Faulconbridge Station platforms is only provided via stairs from the footbridge
- access to the bus stop on the station side of the Great Western Highway is only via stairs from the footbridge
- the ramp from the existing accessible car spaces in western commuter car park to footbridge is non-compliant with the DSAPT
- the existing accessible car spaces do not meet current standards

- the existing footbridge stairs and platform edges do not have TGSI's installed
- platform cross fall grades in some areas do not meet current DSAPT requirements
- existing toilet facilities are not accessible.

2.4. Options considered

To achieve the desired project outcomes, two main design options were considered to upgrade Faulconbridge Station. These options considered a number of upgrade elements including various lift configurations and other minor station precinct upgrades. A 'do nothing' option was also considered for comparative purposes to the proposed option.

2.4.1. The 'do-nothing' option

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

2.4.2. Option 1

This option includes the provisions of two lifts to the existing footbridge. One lift would be positioned to provide access to the station platform from the footbridge. The second lift would be positioned to provide access between the footbridge and the rail corridor side of Great Western Highway and would also connect the footbridge to the nearby bus stop.

This option also includes provision of a new ramp from the footbridge to the commuter car park on the western side of the Great Western Highway, to replace the existing non-compliant access path and provides direct access to the top of the footbridge.

This option would include an upgrade of all existing stairs with new compliant hand rails, TGSI's and nosing. There would also be other minor works including platform re-grading, conversion of the existing toilets to include a family accessible toilet and an ambulant toilet and modification to the existing commuter car park and kiss and ride bay.

2.4.3. Option 2

This option includes the provisions of four lifts to the existing footbridge:

- the first lift would be positioned to provide access to the station platform from the footbridge
- the second lift positioned to provide access between the footbridge and the rail corridor side of Great Western Highway and would also connect the footbridge to the nearby bus stop
- the third lift would be positioned on the eastern side of the rail corridor which would provide an alternative to the existing stairs and ramp. No ramp upgrades would be made for this option
- a fourth lift to the west of Great Western Highway would also be installed to provide an alternative to the non-compliant ramp from the commuter car park.

Similar to Option 1, this option would also provide an upgrade of all existing stairs with new compliant hand rails, TGSI's and nosing. There would also be other minor works including platform upgrades and conversion of existing toilets to family accessible toilet and an ambulant toilet.

2.4.4. Assessment of identified options

Each of the options were quantitatively and qualitatively assessed using TfNSW's Multi-Criteria Assessment (MCA) framework by TfNSW representatives and other key stakeholders. The assessment included consideration of factors such as customer experience, accessibility, safety, engineering constraints, urban design, maintenance, modal integration and cost to select a preferred option.

2.5. Justification for the preferred option

The 'do nothing' option was not considered a feasible alternative as it would be inconsistent with the legislative requirements of the DDA and NSW Government objectives for improving the accessibility of transport interchanges, train stations and commuter car parks across NSW as a priority under the Transport Access Program as described in Section 2.2 and 2.3. The 'do nothing' option would also not help encourage the use of public transport, and would not meet the needs of the Faulconbridge community.

Based on the remaining options, Option 1 was identified as being the preferred option based on the MCA. This option was considered to be preferred as:

- it would achieve DSAPT compliance without significant negative impacts
- the new ramp location uses the existing entrance point of footbridge as a lift would not
- improved access from both the east and west of the station to station platforms and Great Western Highway
- a similar level of accessibility compared with Option 2 with substantially reduced maintenance costs due to a reduced number of lifts would be provided
- it would provide a reduced construction duration compared to Option 2, which would also reduce the construction impact on community and customers
- it would provide reduced visual impacts including less impacts to local heritage listed station when compared to Option 2.

3. Proposal description

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

3.1. The Proposal

As described in Section 1.1, the Proposal involves an upgrade of Faulconbridge Station as part of the Transport Access Program which would improve accessibility and amenity for customers. The Proposal would include the following key elements:

- construction of a new lift connecting the existing footbridge to the station platforms
- construction of a new lift connecting the existing footbridge to the Great Western Highway
- upgrade of the existing footbridge and all stairs including new handrails, TGSIs, and nosings
- internal station building works including:
    - reconfiguration of the existing station waiting room including door widening, and provision of allocated wheelchair spaces
    - reconfiguration of the existing toilets to accommodate one new unisex family accessible toilet and one new unisex ambulant toilet.
- modifications to the commuter car park including:
    - upgrade of the two existing accessible car parking spaces
    - upgrade of the existing kiss and ride bay
    - construction of a new DSAPT compliant ramp (including demolition of the existing non-compliant path) from the existing footbridge to the commuter car park (including demolition of the existing non-compliant path)
    - provision of a new pedestrian rest area with seating from the car park to the footbridge
- upgrade of the existing platform and access paths to include TGSIs and safety zone markings
- provision of five bike hoops with capacity for ten bicycles
- provision of access paths and circulation spaces to connect all customer facilities at the station (e.g. proposed lifts, kiss and ride bay, accessible car parking spaces, family accessible toilet, etc.)
- ancillary works including adjustments to lighting, relocation or replacement of existing customer facilities (e.g. platform seating, bins, telephone booth, Opal card readers, fencing etc.), improvement to station systems (including additional CCTV cameras, LED lighting, Public Address (PA) system, and hearing loops), and wayfinding signage.

Figure 1.1 shows the general layout of key elements for the Proposal and Figure 3.1 and Figure 3.2 provides an elevation view of the Proposal.

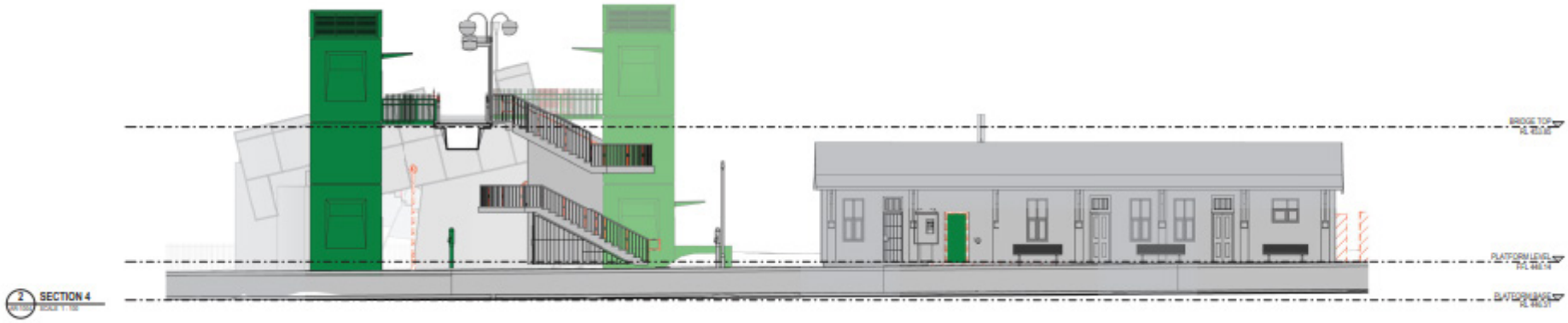

Figure 3.1 Elevation view for the station platform

Source: DesignInc, 2018, Note: proposed works shown in green, existing infrastructure shown in grey

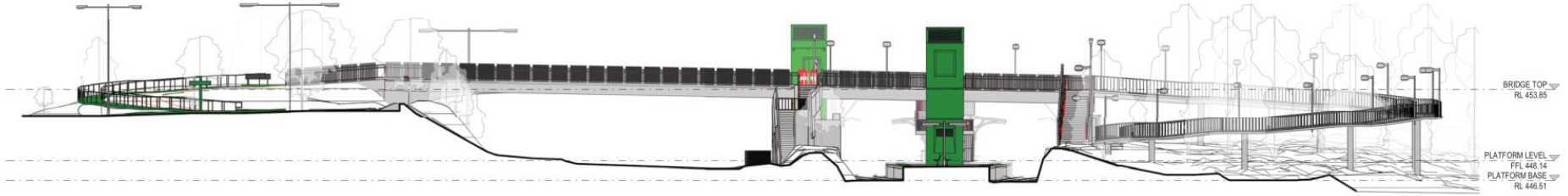

Figure 3.2 Elevation for the station platform including footbridge and ramp access

3.2. Scope of works

3.2.1. Station upgrade

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

- construction of two new lifts to allow access to the station platform and Great Western Highway. Each lift would include an entry landing with canopy for weather protection. Existing sections of footbridge balustrade/handrail would be removed as required to accommodate the new lift landing areas. The location of the two lifts would include:
    - south of the existing footbridge, to provide access between the existing footbridge and the station platform
    - north of the footbridge to provide access between the existing footbridge and the bus stop at the Great Western Highway
- an upgrade of the existing platform surfaces (including localised regrading/re-surfacing) to provide compliant access paths and may include removal of some platform vegetation that encroaches on access paths
- an upgrade of existing platform and access paths to include TGSIs and safety zone markings including removal of planter boxes on platform
- identification of boarding assistance zones on platform
- an upgrade of all existing stairs to include new compliant handrails, TGSIs and nosings.

3.2.2. Station building modifications

The following modifications would be undertaken within the station building:

- internal station building work including:
    - reconfiguration of the existing station waiting room including, door widening for wheelchair access, and allocated spaces for wheelchairs
    - reconfiguration of the existing male toilets into one new unisex family accessible toilet, including demolition of the brick privacy screen in front of the existing male toilet entrance
    - reconfiguration of the existing female toilets into one new unisex ambulant toilet
    - new canopy over the entry to the new family accessible toilet.

3.2.3. Parking, kiss and ride and pedestrian works

The following upgrade work would be undertaken to the existing commuter car park on Railway Avenue.

- provision of two upgraded accessible parking spaces and formalised kiss and ride bay, including new line marking, signage and bollards as required
- localised regrading within the commuter car park and any associated work
- provision of a new DSAPT compliant ramp (including demolition of the existing non-compliant path) from the existing footbridge to the accessible parking spaces
- provision of a new rest area with seating and one wheelchair space at the western entrance of the existing footbridge.

3.2.4. Ancillary work

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

- modification of existing seating at the bus stops on Great Western Highway to provide one allocated wheelchair space in each shelter
- provision of wayfinding signage within the station and interchange precinct
- provision of anti-graffiti coating to all new and modified hard surfaces
- relocation of any existing station platform furniture including but not limited to seats, Opal card readers, rubbish bins, boarding ramp cabinets, and lighting
- upgrades to existing customer facilities including relocation of existing telephone booth and provision of new accessible water fountain
- improvements to existing station systems (including installing additional CCTV cameras as required, installing new LED lighting, and provision of new Public Address (PA) system speakers as required)
- provision of hearing loops at the station
- temporary site compounds for storage of material and equipment
- temporary work (where required) during construction to maintain access to the station
- installation of portable fire extinguisher/s
- provision of five bike hoops within the station precinct
- landscaping/planting within the station/car park precinct
- electrical upgrade works including any distribution boards as required to accommodate the power requirements for the Proposal.

3.2.5. Materials and finishes

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

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

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

- lift structure –concrete lift shaft with glazing, painted steel canopy and mesh screens at rest areas
- footpaths and ramps – stainless steel handrails, concrete with non-slip textured finish
- upgraded stairs – replace non-compliant handrails, nosing and TGSIs on existing stairs
- family accessible toilet and entry canopy – painted steel frame and glass
- regraded platform surface – materials to match existing and achieve compliance.

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

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

3.3. Design development

3.3.1. Engineering and environmental constraints

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

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

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

Heritage: Faulconbridge Station is listed on the Section 170 NSW State Agency Heritage and Conservation register maintained by RailCorp and the *Blue Mountains Local Environmental Plan 2015* (LEP). The upgrade and refurbishment work would have potential impacts on the heritage significance of Faulconbridge Station. Future (detailed) design development would consider the mitigation measures from the Statement of Heritage Impact (SoHI) from Section 6.5. The concept design development has taken this potential impact into consideration and explored all possible opportunities for mitigation.

Construction access: customer access to the station would be maintained throughout the construction works. When required, footbridge closures to allow construction would take place during scheduled rail possessions.

The western commuter car park off Railway Avenue would be mostly open throughout construction with traffic control measures in place as required. Access to this car park would be restricted for work undertaken in scheduled rail possessions and during the upgrade of the accessible parking spaces and formalisation of the kiss and ride bay.

Access along the Great Western Highway would mostly be maintained throughout construction however lane closures may be required for some construction activities including lift installation work involving the use of a crane.

Utilities: Detailed Site Survey has identified a number of utilities in the vicinity of the proposed work including:

- station lighting
- low voltage within the station platform and high voltage within galvanised steel troughing (GST) along the rock face within the rail corridor.
- telecommunication services (underground)
- stormwater and water
- rail utilities, including signalling cabling and overhead wiring.

3.3.2. Design standards

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

- Disability Standards for Accessible Public Transport 2002 (issued under the Commonwealth Disability Discrimination Act 1992)
- Building Code of Australia (BCA) 2016

- relevant Australian Standards
- TfNSW Asset Standards Authority standards
- Sydney Trains standards
- Guidelines for the Development of Public Transport Interchange Facilities (Ministry of Transport, 2008).
- Crime Prevention Through Environmental Design (CPTED) principles
- Council standards, codes and guidelines (where relevant)
- other TfNSW policies and guidelines.

3.3.3. Sustainability in design

TAP is targeting a rating of 'Excellent' using the Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability (IS) Rating Scheme (v1.2). The rating scheme provides an independent and consistent methodology for the application and evaluation of sustainability outcomes in infrastructure projects. The sustainability outcomes address environmental, social, economic and governance aspects, energy and greenhouse gases.

The IS Rating Scheme is grouped into six key themes:

- management and governance
- using resources
- emissions, pollution and waste
- ecology
- people and place
- innovation.

These sustainability themes are divided into 15 performance categories, against which the Proposal would be independently assessed and assigned a rating level. The Proposal would need to achieve between 50 and 74 points to be certified as 'Excellent' under IS version 1.2.

3.4. Construction activities

3.4.1. Work methodology

Subject to approval, construction is expected to commence in mid-2020 and take approximately 12 – 18 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Construction Contractor in consultation with TfNSW.

The proposed construction activities for the Proposal are identified in Table 3.1. This staging is indicative and is based on the current concept design and may change once the detailed design methodology is finalised.

Table 3.1 Indicative construction staging for key activities

Activity	Works completed	Timing (indicative)
Activity 1: Site establishment and enabling work	• establish site compounds (i.e. erecting fencing, tree protection zones, site offices, amenities and plant/material storage areas) • establish temporary facilities as required (e.g. temporary access stairs, temporary toilets, temporary construction lights etc.) • erect site hoarding / fencing as required • service location and relocation.	Standard hours
Activity 2: Lift work	• excavate and rock breaking for lift pits/foundations • demolish remnant bridge footing under platform (in new lift location) • waterproof (as required), install reinforcement, formwork and concrete to form the lift pit • erect glass and steel shaft structure • lift installation and commissioning • implement architectural fit-out around lift shaft including new awning over the lift.	Standard hours, night-works and 48-hour rail shutdown during scheduled Sydney Trains track maintenance weekends
Activity 3: Stair upgrade	• demolish existing non-compliant rails (where required) • modify stairs including installation of new nosings, hand railing and TGSIs.	Standard hours
Activity 4: Ramp upgrade	• perform earthworks for new ramp grading • install ramp formwork and structure • install ramp fitout of new hand rails, seating and TGSI's.	Standard hours
Activity 5: Commuter car park upgrades	• reconfigure the existing roadway (kerb, line marking, etc.) to accommodate the upgraded accessible parking and kiss and ride bays • install new kerb ramps • widen footpath landing connection to ramps.	Standard hours and 48-hour rail shutdown during scheduled Sydney Trains track maintenance weekends
Activity 6: Station building works	• install new family accessible toilet and ambulant toilets in place of existing toilet facilities • include door widening to waiting room to allow wheelchair access, provision of allocated space in waiting room • upgrade the general station infrastructure including DDA signage, CCTV etc. where applicable	Standard hours and 48-hour rail shutdown during scheduled Sydney Trains track maintenance weekends
Activity 7: Platform modification work	• regrade platform surface as required for accessible path • relocate platform furniture along accessible paths • install new yellow line and tactiles along platforms • install new canopy extension • relocate seating • install new drinking fountain and adjust telephone booth height • install new Opal card reader.	Standard hours or 48-hour rail shutdown during scheduled Sydney Trains track maintenance weekends
Demobilisation	• install other ancillary features and landscaping • remove hoardings • clear site • remove environmental, safety and traffic controls.	Standard hours

3.4.2. Plant and equipment

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

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

3.4.3. Working hours

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

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

Certain activities would need to be undertaken outside of standard hours including night work, weekend work and work during scheduled Sydney Trains rail possessions. These 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 would be required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to improve the safety of railway workers and operational assets. It is estimated that approximately six rail shutdowns periods would be utilised to facilitate the following activities:

- site survey and services location investigations within and around the rail corridor
- excavation and installation of lift shafts and canopy structures
- regrading platform surface and installation of TGSI's
- services relocations.

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

3.4.4. Earthworks

Excavations and earthworks would generally be required for the following:

- the construction of both new lift pit, which would require excavation through the platform into the existing soil/fill at this location
- grading of the new ramp from the footbridge to the commuter car park, and works within the car park including upgrading the DDA car spaces, kiss and ride bay and any associated work
- other minor civil works including footings and foundations for structures and trenching activities for service adjustments and relocations.

Excavated material would occur and reused onsite where possible or disposed of in accordance with relevant legislative requirements. The detail design would confirm with the volume of materials excavated to accommodate the lift pit and foundation, and other ancillary work.

3.4.5. Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal and would consider the requirements of the ISCA 1.2. Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

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

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:

- temporary increase in walking distance for rail customers on the station platform during construction work due to placement of construction hoarding and work sites as well as closed access path from the car park
- higher road safety risk levels associated with construction vehicle-pedestrian interactions
- increased congestion and travel time on Great Western Highway south bound due to temporary lane closures during the lift installations as well as maintenance purposes related to the hi rail access point
- potential increase in parking demand at the commuter car park on the west of the station as a result of temporary closure of the informal parking space on the east of the station
- reduced parking spaces due to partial closure of the commuter car park during upgrade work to the accessible parking spaces and kiss and ride bay,
- minor disruptions to pedestrian/cyclist movements in and around the station
- minor increase in traffic on the local road network.

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

3.4.7. Ancillary facilities

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

Two areas have been identified for proposed construction compounds as shown in Figure 3.3 and are:

- the cleared land to the east of Faulconbridge Station between the rail corridor and Sir Henrys Parade
- an area of cleared land north to the commuter car park on the west side of Faulconbridge Station with potential pruning of trees to access the area.

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

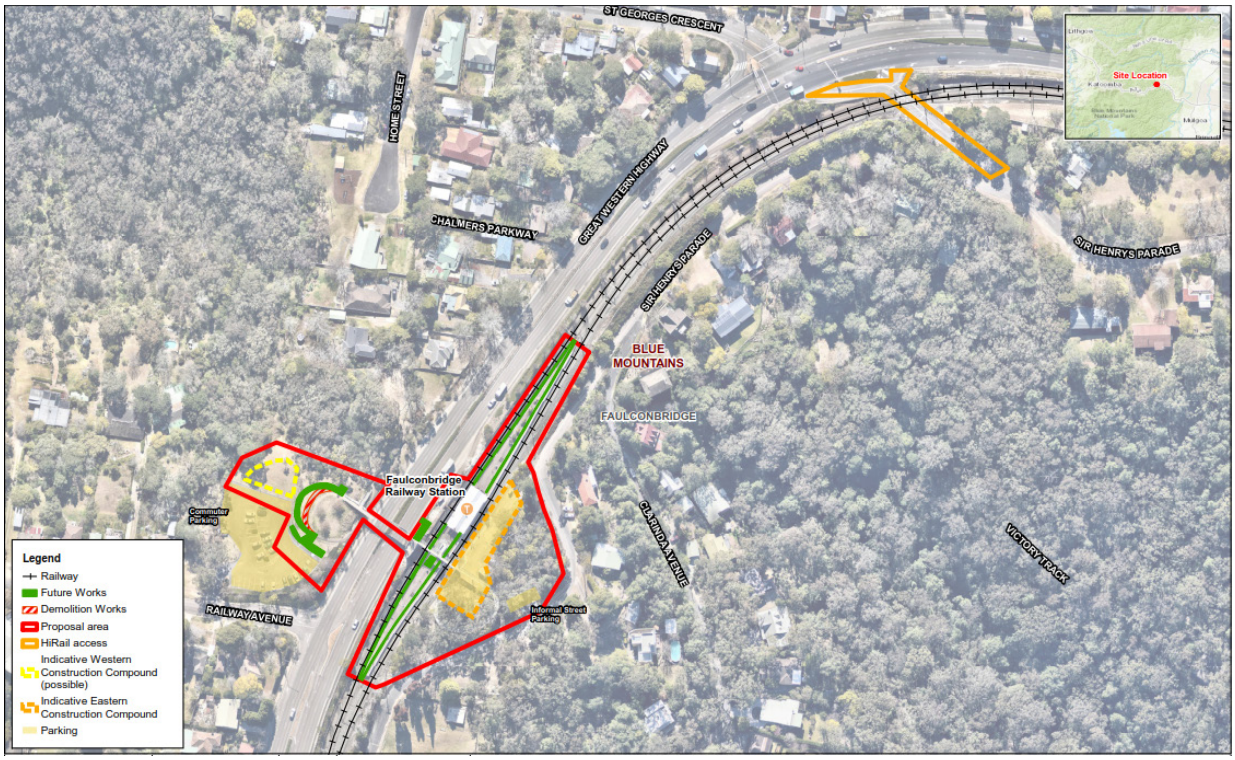

Figure 3.3 Construction compounds and study areas

(Indicative only)

3.4.8. Public utility adjustments

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

A power supply upgrade may be required to the local Endeavour Energy network to provide sufficient capacity for the proposed works. The extent of the required upgrade would be assessed during detailed design and would be designed to the standards of and approved by the relevant utility authorities.

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

3.5. Property acquisition

TfNSW does not propose to acquire any property as part of the Proposal. A temporary Licence to Occupy or lease of the construction compound area would be obtained from Blue Mountains City Council for the duration of the works.

3.6. Operation and maintenance

The future operation and maintenance of Faulconbridge Station is subject to further discussions with Sydney Trains, NSW TrainLink, TfNSW and Blue Mountains City Council (BMCC). However, the Proposal is not anticipated to significantly alter the current operating arrangements.

Structures and landscaping within the rail corridor would be maintained by Sydney Trains while the commuter car park would continue to be managed by BMCC.

4. Statutory considerations

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

4.1. Commonwealth legislation

4.1.1. Environment Protection and Biodiversity Conservation Act 1999

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

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

4.1.2. Other Commonwealth legislation

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

Table 4.1 Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	There is an obligation on a person who discovers anything which he or she has reasonable grounds to suspect are Aboriginal remains to report that discovery to the Minister, giving particulars of the remains and their location. The Proposal does not include any previously identified Aboriginal sites and/or places (refer section 6.5); however, considerations for unexpected finds further detailed in mitigation measures and applies to this Act.
Disability Discrimination Act 1992 (DDA)	This Act aims to eliminate as far as possible, discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land. The Proposal would be designed having regard to the requirements of this Act. The key objective of the Proposal is to improve the accessibility of Faulconbridge 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 TfNSW as a public authority who is to exercise its functions in a manner that promotes certain common objectives, including to promote the delivery of transport services in an environmentally sustainable manner.

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

(a) to plan for a transport system that meets the needs and expectations of the public

(b) to promote economic development and investment

(c) to provide integration at the decision-making level across all public transport modes

(d) to promote greater efficiency in the delivery of transport infrastructure projects

(e) to promote the safe and reliable delivery of public transport and freight services.

4.2.2. Environmental Planning and Assessment Act 1979

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

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

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

4.2.3. Other NSW legislation and regulations

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

Table 4.2 Other NSW legislation applicable to the Proposal

Applicable legislation	Considerations
Biodiversity Conservation Act 2016 (BC Act)	The site does not contain suitable habitat for any listed threatened species or community and is unlikely to have a significant impact on any threatened species or community (refer to Section 6.6 for further details).
Biosecurity Act 2015	No Priority Weeds listed under the *Biosecurity Act 2015* for the Greater Sydney Region were identified in the study area. Appropriate management methods would be implemented during construction if declared noxious weeds in the Blue Mountains LGA are identified (refer to Section 6.6).
Contaminated Land Management Act 1997 (CLM Act)	The CLM Act regulates significantly contaminated land through requirements for notification to the EPA, investigation, remediation and recovery of costs from the person responsible. The NSW Environment Protection Authority (EPA) must be notified by the property owner in writing of any contamination identified within the proposal site in accordance with the requirements of Section 60 of the Act. The site has not been declared under the CLM Act as being significantly contaminated (refer to Section 6.8).
Heritage Act 1977 (Heritage Act)	Sections 57 and 60 require approval for works which may have an impact upon items listed on the State Heritage Register. Sections 139 and 140 require similarly require approval where relics are likely to be exposed. For any works which may have an impact upon items listed on a Section 170 heritage and conservation register maintained by a government agency, notification to the Heritage Division may be required. One listed heritage item is located within the Proposal study area, the Faulconbridge Railway Station Group. This heritage item is listed on the RailCorp Section 170 Heritage and Conservation Register (item 4801064) and Blue Mountains LEP 2015 (item FB005).

Applicable legislation	Considerations
	A heritage impact assessment has been undertaken for the Proposal and is summarised in Section 6.5. The archaeological assessment concluded that there is a low risk of exposing historical archaeological relics during the construction of the Proposal and that no archaeological approvals under Section 139 would be required. However, if unexpected archaeological items are discovered during the construction of the Proposal, all work within the Proposal area would cease and appropriate advice sought, in accordance with the *TfNSW Unexpected Heritage Finds Guideline* (TfNSW, 2016a). No items of state heritage significance were identified near the Proposal, and therefore an approval under Section 60 of the Heritage Act would not be required.
National Parks and Wildlife Act 1974 *(NPW Act)*	Sections 86, 87 and 90 of the NPW Act require approval from Heritage NSW for any works which may impact an item of Aboriginal Heritage. The Proposal is unlikely to disturb any Aboriginal objects (refer Section 6.4). However, if unexpected archaeological items or items of Aboriginal heritage significance are discovered during the construction of the Proposal, all work would cease and appropriate advice sought. The Proposal would not involve impacts to land reserved, or adjacent to, land reserved under the NPW Act.
Protection of the Environment Operations Act 1997 (PoEO Act)	The Proposal would not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, TfNSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Construction Contractor.
Roads Act 1993 *(Roads Act)*	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require approval for works on unclassified roads. The roads surrounding the Proposal site are local roads, managed and maintained by Blue Mountains City Council (refer to Section 6.1). The Proposal would involve work on Great Western Highway, which is a classified road under the Roads Act. Approvals under the Roads Act are therefore expected to be required. A road occupancy licence would be required to be obtained under Section 138 of the Roads Act in order to perform temporary works for the Proposal, in particular for the temporary lane closures required to the Great Western Highway during the installation of the proposed lifts. Where works are required that would impact on local roads surrounding the site, these works would be undertaken in consultation with Blue Mountains City Council including obtaining Road occupancy Licence(s) for temporary road closures to facilitate work (where required).
Water Management Act 2000 (WM Act)	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.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act)	TfNSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared.

4.2.4. Key State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

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

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

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

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

> *'(d) railway stations, station platforms and areas in a station complex that commuters use to get access to the platforms*
>
> *(e) public amenities for commuters*
>
> *(f) associated public transport facilities for railway stations…'*

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

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

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

State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011

The majority of the Proposal would be located within the boundary of the Sydney Drinking Water Catchment. As such, the *State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011* would be applicable to the Proposal. This SEPP has three main aims being:

- to support healthy water catchments that deliver high quality water and permit development that supports that goal
- to ensure that consent authorities only allow proposed developments that have a neutral or beneficial effect on water quality
- to support water quality objectives in the drinking water catchment.

As per clause 12 of the *Sydney Drinking Water Catchment SEPP*, public authorities undertaking works on land regulated by the SEPP are required to consider the effect on water quality before undertaking the activity and consider whether the activity would have a neutral or beneficial effect (NorBE) on water quality. A NorBE was undertaken for the Proposal and is included in Appendix C. The assessment concluded that the Project would have a neutral effect on water quality.

State Environmental Planning Policy No 44—Koala Habitat Protection

State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP 44) aims to encourage the proper conservation and management of natural vegetation areas that provide

habitat for koalas to ensure that permanent, free living areas are maintained over their present range. The policy applies to a number of LGAs across NSW, including the Blue Mountains LGA which the Faulconbridge Station is located within.

As the Proposal is to be assessed under Division 5.1 of the EP&A Act, SEPP 44 does not formally apply, however the provisions of SEPP 44 have been considered in the preparation of this REF and detailed in Section 6.6.

State Environmental Planning Policy 55 – Remediation of Land

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

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

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

4.2.5. Blue Mountains Local Environmental Plan 2015

The Proposal is located within the Blue Mountains LGA. The ISEPP prevails over all other environmental planning instruments (such as LEPs) except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018.* During the preparation of this REF, the provisions of *Blue Mountains Local Environmental Plan 2015* were considered (refer to Table 4.3 which identifies land use specific to the Proposal).

Land use in the Proposal include the following:

- small recreational areas adjacent to the footbridge (zoned RE1: Public Recreation)
- Sir Henry Parkes Grave and associated cemetery infrastructure (zoned SP2: Infrastructure).

The local area west of the station is mainly residential (zoned E4: Environmental Living). The commuter car park at the Railway Avenue and its associated public open space (zoned RE1: Public Recreation) locates to the west of the station along the Great Western Highway. Figure 4.1 details land use for this Proposal.

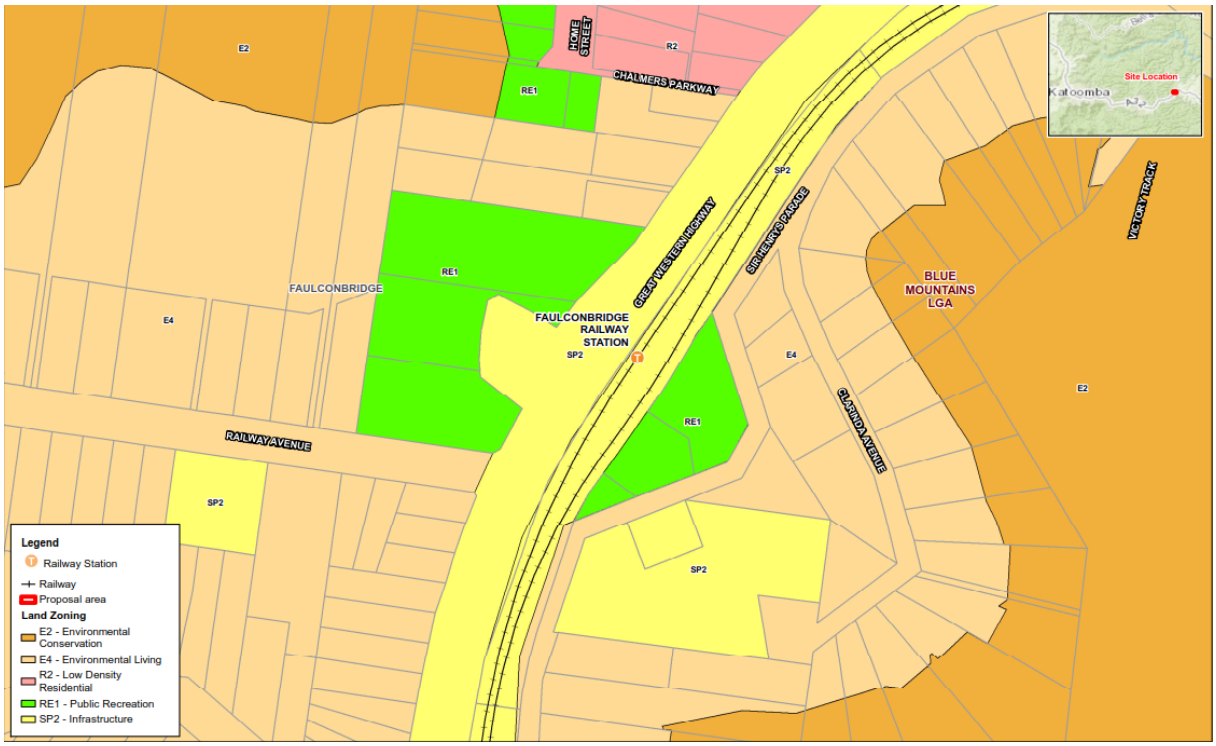

Figure 4.1 Blue Mountains LEP zoning map

Table 4.3 Relevant provisions of the Blue Mountains LGA

Provision description	Relevance to the Proposal
Clause 2.3 – Zone objectives and Land Use Table	**Applicable land zones** • SP2 Infrastructure (Rail Infrastructure) for the proposed work associated with the station. • RE1 Public Recreation for the proposed work on the east side of the station adjacent to Sir Henrys Parade.
Clause 2.3 – Zone objectives and Land Use Table (cont.)	**Zone objectives** • SP2 Infrastructure (Rail Infrastructure) - to provide for infrastructure and related uses and to prevent development that is not compatible with or that may detract from the provision of infrastructure. • RE1 Public Recreation - to enable land to be used for public open space or recreational purposes, to provide a range of recreational settings and activities and compatible land uses, to protect and enhance the natural environment for recreational purposes and to enhance the quality of life of residents and visitors and improve the amenity of the villages in the Blue Mountains through the provision and management of open space. The Proposal is consistent with the objectives of SP2 as development of a rail infrastructure is permissible with consent for rail facilities. RE1 has no identified features as part of this Proposal. As the provisions of ISEPP prevail over the Blue Mountains LEP, development consent from the Blue Mountains City Council is not required.
Clause 5.10 – Heritage Conservation	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. Faulconbridge Railway Station Group (item FB005) is listed on the heritage schedule of the Blue Mountains LEP.

Provision description	Relevance to the Proposal
	A discussion of potential impacts to local heritage and the requirements for consent is provided in Section 6.5.
Clause 6.3 – Terrestrial Biodiversity	Clause 6.3 of the Blue Mountains LEP aims to protect, maintain and improve the diversity and condition of native vegetation and habitat. The western side of the station is mapped as having terrestrial biodiversity. A discussion of potential impacts to terrestrial biodiversity and the requirements for consent is provided in Section 6.6
Clause 6.14 – Earthworks	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. By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the Proposal is permissible without development consent. Consideration of the potential impacts and mitigation measures for earthworks for the Proposal is outlined in Section 6.8.

4.3. Ecologically sustainable development

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

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

The principles of ESD have been adopted by TfNSW throughout the development and assessment of the Faulconbridge Station Upgrade. Section 4.3 summarises how ESD has been incorporated in the design development of the Proposal. Section 6.13 includes an assessment of the Proposal on sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5. Community and stakeholder consultation

Chapter 5 discusses the consultation 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 Faulconbridge Station, including a range of TfNSW divisions and Sydney Trains, were engaged during the development of the Proposal to provide insights into the scope of work for the Proposal, and to also participate in the development and assessment of the station improvement options.

5.2. Consultation requirements under the Infrastructure SEPP

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

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

Table 5.1 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 | Consultation with Councils – development with impacts on council related infrastructure and services	Consultation is required where the Proposal would result in: • substantial impact on stormwater management services • generating traffic that would place a local road system under strain • involve connection to or impact on a council owned sewerage system • involve connection to and substantial use of council owned water supply • significantly disrupt pedestrian or vehicle movement • involve significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes work that would: • disrupt pedestrian and vehicle movement • impact on road pavements under Council's care and control • impact on Council-operated footpaths • impact on commuter car park area • impact on informal car parking space on the east side of the station (partly located on Council land). Consultation with Blue Mountains City Council would be undertaken throughout the public display, detailed design and construction phases of the Proposal.
Clause 14 | Consultation with Councils – development with impacts on local heritage	Where railway station works: • has a 'not minor or inconsequential impact' on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area.	Faulconbridge Railway Station Group (item FB005) is listed on the Blue Mountains LEP heritage schedule of 2015 (refer to Section 6.5) Consultation with Blue Mountains City Council would be undertaken throughout the detailed design and construction phases.

Clause	Clause particulars	Relevance to the Proposal
Clause 15 | Consultation with Councils – development with impacts on flood liable land	Where railway station works: • impact on land that is susceptible to flooding – reference would be made to *Floodplain Development Manual: the management of flood liable land.*	The Proposal is not located on land that is susceptible to flooding. Consultation with Blue Mountains City Council is not required in regard to this aspect. Refer to Section 6.9.
Clause 15A **Consultation with Councils – development with impacts on certain land within the coastal zone**	Where railway station works: • impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land.	The Proposal is not located within a coastal vulnerability area as per the *Coastal Management Act 2016*. Consultation with Blue Mountains City Council is not required in regard to this aspect.
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	Where railway station works: impact on flood liable land -written notice must be given (together with a scope of works) to the State Emergency Services and taken into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given.	The Proposal is not located on land that is susceptible to flooding. Consultation with State Emergency Service is not required in regard to this aspect. Refer to Section 6.9.
Clause 16 | Consultation with public authorities other than Councils	For *specified development* which includes consultation with the EES (formerly OEH) for development that is undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974*, and other agencies specified by the Infrastructure SEPP where relevant. Although not a specific Infrastructure SEPP requirement, other agencies TfNSW may consult with could include: • Roads and Maritime • Sydney Trains • NSW TrainLink • EES (formerly OEH).	The Proposal is located nearby to land reserved under the *National Parks and Wildlife Act 1974* about 350 metres. As the Proposal is not adjacent or within this land, TfNSW is not required to provide undertake consultation with the EES.

5.3. Consultation strategy

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

The objectives of the consultation strategy are to:

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

5.3.1. Public display

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

- public display of the REF at various locations
- distribution of a project newsletter to the local community including businesses and residents, key stakeholder groups and customers, outlining the Proposal and inviting feedback on the REF
- advertisement of the REF public display in local newspapers that includes a summary of the Proposal, how to view the REF, information on how to provide feedback, and TfNSW's contact details
- consultation with Blue Mountains City Council, Sydney Trains, and other key non-community stakeholders
- a community information session near the station.

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 prior to the commencement of the public display period. The REF would be displayed for a period of approximately two weeks.

The REF would be placed on public display on the TfNSW website[1], NSW Government Have Your Say website[2] and hard copies at the following locations:

- Transport for NSW Office
  Level 5, Tower A, Zenith Centre,
  821 Pacific Highway, Chatswood 2067
- Springwood Central Library, 104 Macquarie Road Springwood

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1 www.transport.nsw.gov.au/faulconbridge

2 www.nsw.gov.au/improving-nsw/have-your-say

Further information on the Proposal may be requested by contacting the Project Infoline (1800 684 490) or by email[3].

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

- Mail: Transport Access Program – Faulconbridge Station Upgrade
  Associate Director, Environmental Impacts Assessment
  Transport for NSW
  Locked Bag 6501
  St Leonards NSW 2065
- Email: projects@transport.nsw.gov.au
- TfNSW website: transport.nsw.gov.au/faulconbridge
- Project Infoline: 1800 684 490
- In person at a project community information session

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

5.4. Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal plus a 200 metre radius, on 10 September 2019. No Aboriginal sites were identified in or near the Proposal.

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

5.5. Ongoing consultation

At the conclusion of the public display period for this REF, TfNSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by TfNSW before determining whether to proceed with the Proposal (refer to Figure 2). Ongoing consultation with key stakeholders would continue including Sydney Trains, NSW trainlink and BMCC throughout detailed design and construction.

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

Should TfNSW determine to proceed with the Proposal, the project team would keep the community, 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 Management Plan (CLMP) to be developed prior to the commencement of construction.

[3] projects@transport.nsw.gov.au

6. Environmental impact assessment

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

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

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

6.1. Traffic and transport

This section provides a summary of the *Traffic, Transport and Access Impact Assessment* prepared by WSP (2019) and which is attached as *Technical Paper 1*. The assessment included the following tasks:

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

6.1.1. Existing environment

Station access

Station access during the morning peak identified that a majority of people walk to Faulconbridge Station (51 per cent) with the remaining access primarily park and ride (26 per cent) and kiss and ride (21 per cent). Access to the station by bus was the smallest at two per cent (Stantec 2018). The current access to Faulconbridge Station is not compliant with DDA requirements, resulting in its consideration for an upgrade.

Access to Faulconbridge Station is provided through an existing footbridge and stairs leading down to the island platform and station building. Access to the footbridge is at three locations:

- Western side of the Great Western Highway from the existing commuter car park via a path
- Eastern side of the Great Western Highway via the stairs, this also provides a connection to the existing pedestrian network and bus stops
- Footbridge and stairs from Sir Henrys Parade from a small unsealed car park.

Surrounding road network

The existing road network around Faulconbridge Station mainly comprises local roads (residential streets) as well as the Great Western Highway, as shown in Figure 6.1.

The Great Western Highway is a four-lane, two-way road that runs in a north-south direction adjacent to Faulconbridge Station. On the western side of the highway is Railway Avenue, a local road that links areas on the western side of the station including residences and a commuter car park. On the eastern side of the station is Sir Henrys Parade a local road that runs in a north-south direction providing access for residences on the east side of the station. Sir Henrys Parade is also the only level road crossing of the railway line that provides access to the informal commuter car park.

Parking

Faulconbridge Station has a formal commuter car park located approximately 110 metres (m) away from the station platform, on the western side of the Great Western Highway which can be accessed via Railway. It provides 48 commuter car parking spaces including two accessible car spaces which are currently non-compliant. Parking at this location is free and unrestricted.

On the eastern side of the station, there is an informal commuter car park with room for four to five vehicles on BMCC owned land. In addition, there is an empty space on the western side of Sir Henrys Parade which has the capacity to hold up to five vehicles.

Figure 6.1 shows the locations of the commuter car park and the informal parking areas at Faulconbridge Station.

Public transport

Rail

Faulconbridge Station is on the Blue Mountains Line providing services to and from Bathurst and Lithgow to Central. Trains toward the city during the morning peak come around every 15 to 30 minutes. Morning peak hour also identified that patronage was 19 people per train.

Bus

Faulconbridge Station has two bus stops located on the Great Western Highway. One of these stops (Stop ID: 277615) is located on the eastern side of the highway within an indented bus bay and contains a bus shelter. The other bus stop (Stop ID: 277621) is located on the western side of the highway and is also an indented bus bay with a shelter (Figure 6.1). There are three bus routes from these stops including 685H Springwood to North Hazelbrook (Loop Service), 690K Springwood to Katoomba and 690P Springwood to Penrith.

During morning peaks one to two services are available for the 690K and 685H routes respectively, and in the afternoon peak three services are available for the 690P route.

Pedestrian infrastructure

There are pedestrian footpaths around the station located on both sides of the Great Western Highway and on one side along Railway Avenue and Sir Henrys Parade. A formal kiss and ride bay is located within the commuter car park on the western side of the Faulconbridge Station. There is currently no formal kiss and ride facility on the eastern side of the station, but informal car park or on-street car park spaces on Sir Henrys Parade can be used as an informal pick up and drop off area.

There are no designated taxi zones in the vicinity of Faulconbridge Station.

Cyclist infrastructure

Cyclist facilities are predominantly located as part of the Great Western Highway as it is a regional on-road cycling route with a shared path provided. The existing shared path facility runs along the both sides of the Great Western Highway with cyclists required to cross the highway via the footbridge at Faulconbridge Station. A dedicated cycleway is provided on the eastern side of the Great Western Highway, south of the footbridge for approximately 250m section.

No bike storage facilities and dedicated cycleways were identified within the vicinity of the station precinct.

Figure 6.1 Existing traffic and transport environment

6.1.2. Potential impacts

a) Construction phase

Site compound haulage routes

As described in section 3.4, two areas have been identified as temporary construction compounds located to the east of Faulconbridge Station between the rail corridor and Sir Henrys Parade and on the western side of Faulconbridge Station adjacent to the commuter car park.

Potential haulage routes for heavy construction vehicles would be primarily via the Great Western Highway which is approved to cater for 19 metre B-Double vehicles. Potential haulage entry and exit points to the Proposal study area would be located off the Great Western Highway at Sir Henry parade to the north and Railway Avenue to the south. Definitive haulage routes would be determined during detailed design and nominated by the construction contractor.

Traffic

The expected construction vehicles generated by the Proposal are expected to be mostly light vehicles (including utility vans) from construction workers. Some heavy vehicle trips for delivery and removal of material, plants and equipment would also be expected to occur (when required such as for the delivery of the lift shafts and associated components).

The traffic generated as a part of the construction works is not expected to exceed around 20 light vehicles and 10 heavy vehicles per day, during the typical construction period.

However during rail possession periods, it is expected that the works would generate up to around 50 light vehicle and 12 heavy vehicle movements.

No significant impacts are expected to local traffic during construction due to the minimal amount of generated traffic. It is also considered that the existing road network would have sufficient capacity to absorb the expected increase in traffic.

Access along the Great Western Highway would be impacted during rail possession periods as it is anticipated that southbound lane closures would be required. Closure would be carried out under a Road Occupancy Licence and would occur outside of standard hours to minimise impacts on motorists.

All routes would remain open during construction, with potential kerbside or median lane closures using barriers, and reduced speed limits. Any changes to existing traffic movements would be made available to the public through a communications strategy.

The existing hi rail access point is located north-east of the study area near the intersection of the Great Western Highway and Sir Henrys Parade. During rail possession periods, approximately eight hi rail equipment vehicles would access the rail corridor from this point for all works in the Blue Mountains Line region. Appropriate traffic control measures will be implemented to facilitate hi rail equipment movement in and out of the rail corridor and maintain access along adjacent roads. Therefore, impacts from hi rail access to general and construction traffic within the surrounding road networks would be negligible.

No significant impacts are expected as closures would occur during the night and any delays from the Proposal during construction are expected to be brief and non-detrimental to the traffic flow.

Parking

The existing commuter car park on the western side of the station would be accessible throughout construction with traffic control measures in place, as required. There would however be partial car park closures during work on car parking spaces and formalisation of the kiss and ride bay. These works are expected to result in temporary loss of less than five car spaces.

Existing DDA car park spaces would be temporarily closed; however, there would be alternative locations within the commuter car park available as a temporary zone with signs and line marking.

During the entire construction period, car parking would not be available at the informal car park, located between the station and Sir Henrys Parade. However low usage was observed during the site inspection and customers could use the locally available off-street parking space on the western side of Sir Henrys Parade as a kiss and ride bay.

Access to the western formal commuter car park would be restricted during works undertaken in scheduled weekend rail possessions. However, since there would be no train services during rail possessions, no parking impacts are expected.

During the typical construction work period, all construction parking would be limited to the main compound site located on the western side of Faulconbridge Station. Sufficient off-street parking would be provided for all workers and contractors inside of the compound site.

During construction, there is potential for temporary disruptions to access the existing kiss and ride bay located within the commuter car park. However, the potential impacts would be expected to be short term and the existing western side of commuter car park and eastern side of informal car park could be used as a temporary kiss and ride bay. As previously discussed, passengers would be able to use the other parking spaces in the commuter car park and on-street parking spaces on Sir Henrys Parade as an informal kiss and ride facility.

Pedestrians and cyclists

Construction work is expected to have a minor impact on the pedestrian and cycle network given the restricted space due to the following:

- installation of lifts on the footbridge may have the potential to impact accessibility for customers, including reduced pedestrian path widths. Works would occur during schedule rail possession periods
- construction of the compliant ramp from the existing footbridge to the commuter car park which would impede customer access during the construction by increasing travel distance and time for those requiring increased accessibility needs
- kiss and ride bay upgrading and provision of new kerb ramp at eastern side of the commuter car park which would impede pedestrian ingress and egress.

Pedestrian and cyclist access near the work zones would be maintained throughout construction where possible and impacts are expected to be minimal. When required, footbridge and footpath closures to allow construction would take place only during scheduled rail possessions, there may be temporary restrictions and disruptions to pedestrian and bicycle manoeuvrability. Any closures would be temporary and safe and suitable detours would be identified as part of the construction traffic management plan as further detailed in Section 6.1.3.

Public transport

Train and bus services within the study area would be maintained during the typical construction periods to ensure that impact to these services is minimised. No significant impacts are anticipated during construction as existing services are infrequent and closures would be temporary.

The existing bus stop located on the eastern side of the Great Western Highway may be affected during the proposed lane closure period and would occur during scheduled rail possessions period when no trains would be running. There would be no impact to bus services during possessions as services at Faulconbridge bus stop do not run at night time; however, there would be bus replacement service during this period.

Emergency vehicle access

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

b) Operation phase

Pedestrians and public transport

The proposed pedestrian facilities including the new lifts and ramps and upgraded stairs would present pedestrian benefits. Access would be improved by providing a DDA compliant ramp from the commuter car park to the pedestrian footbridge and via new lift to and from the Great Western Highway. This would improve the accessibility of the station for customers with disabilities, customers with less mobility, parents/carers with prams, and customers with luggage.

Once the Proposal is constructed, it is anticipated the pedestrian flow would remain consistent as the proposal has been designed to improve pedestrian manoeuvrability throughout the station precinct.

Additional bicycle storage facility would be provided in the western station precinct. The Proposal would include a total capacity for 10 bikes which is considered to be adequate to

cater for the current and potential future demands. Indicative locations for bicycle storage facility are not determined and would consider CPTED principles in detailed design.

The Proposal would also allow for accessible interchange across all transport modes, in particular to and from the train station platform and external road network, bus stops and accessible parking spaces. No significant impacts on bus or rail operations are expected.

Traffic

The Proposal is not anticipated to have a direct increase in traffic generation during operation. It is anticipated that access to and from the station would be slightly shifted towards active forms of transport (e.g. biking and walking) given the upgrade and improved connection to the nearby bus stops as this would encourage safe and easy walking alternatives over vehicle transport modes.

Parking

The number of car parking spaces (48 including two DDA accessible spaces) would be maintained at the commuter car park. The proposed realignment of the ramp from the existing footbridge to the commuter car park and provision of upgraded DDA car parking spaces and kiss and ride bay are anticipated to have a positive impact for customers. Given that the proposed upgrade would provide a higher level of station accessibility and usability at Faulconbridge Station, the improved customer experience has the potential to attract greater usage.

No changes to existing parking arrangements are expected on the eastern side of Faulconbridge Station as a result of the Proposal.

6.1.3. Mitigation measures

The general mitigation measures recommended for implementation, to minimise access impacts during the construction of the Proposal are outlined in Section 7.2.

- The following proposed mitigation measures are to address and reduce the level of impact to station patrons using the existing facilities:
    - a drive-thru assessment or swept path analysis should be conducted to ascertain that sufficient manoeuvring space is provided for the largest design vehicle along the proposed haulage routes between the Great Western Highway and the main compound site via Sir Henrys Parade
    - a Traffic Control Plan (TCP) to be developed for any construction works that requires lane closure on the Great Western Highway. Implementation of TCP will ensure that adequate warning and guidance is provided to road users, thus minimising road related traffic impacts. TCP would be required to be submitted to Transport Management Centre (TMC), Transport for NSW, where required
    - appropriate traffic control measures will be implemented to facilitate hi rail equipment movement in and out of the rail corridor and maintain access along adjacent roads
    - in parallel with the installation of the lifts, staircase access to Faulconbridge Station footbridge would be maintained. If any closure of the existing footbridge would be required for the lift installation, the construction works would be programmed during a scheduled rail possession period to minimise impacts on pedestrians
    - to minimise traffic impacts to the existing kiss and ride and DDA car parking spaces, alternative locations within the commuter car park can be utilised as a temporary zone with signs and line marking
    - staging of a new DDA compliant ramp (including demolition of existing non-compliant path) would be necessary to minimise the impacts to pedestrians and cyclists accessing the station from the proposed works. Alternative staircase access exists, should pedestrians need to be re-directed, to bypass construction activities

- a suitable path of travel between the existing staircase on the eastern side of Faulconbridge Station and Sir Henrys Parade would be provided during works to allow pedestrians to safely bypass compound site and construction vehicular movements

- suitable vehicle, pedestrian and cyclist paths would be maintained throughout the construction of the proposed upgrade to ensure safe and easy access throughout the interchange outside of the scheduled rail possession periods
- suitable pedestrian provisions would be made to ensure that pedestrian connectivity between bus stops is not impacted as a part of the works and that suitable and safe paths are provided.

6.2. Urban design, landscape and visual amenity

This section provides a summary of the *Landscape and Visual Impact Assessment* prepared by IRIS Visual Planning + Design (2019) (*Technical Paper 2*). The methodology used to undertake this assessment is provided in Section 4.0 of the *Landscape and Visual Impact Assessment*.

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

Landscape character

Faulconbridge Station is located over a kilometre south of Faulconbridge village.

The undulating landform surrounding the station generally rises from east to west. The rail corridor is oriented north to south in the vicinity of the station and follows the Great Western Highway, which are both located within a gentle valley. In the surrounding landscape of the station, there is low-rise and low-density residential development including several heritage-listed houses with mature trees and gardens.

On the eastern side of the station, Faulconbridge Cemetery contains the grave of Sir Henry Parkes on Sir Henrys Parade. The landform drops away sharply in this area, which in combination with the exiting mature trees, is visually separated from the station.

Generally, the station is enclosed by dense areas of vegetation along the existing road and rail corridors, which visually contain the station from surrounding residential areas. The boundary of the road and railway corridors to the north and south of the station is partially vegetated, creating a strong north south visual boundary, enclosing and filtering views between the station and adjacent highway.

The station and highway are cut into a local east-west ridgeline, so that the rail corridor is on an embankment as it approaches the station from both the north and south, and transitions to a cutting at the station. There are exposed sandstone rock faces to the east of the station, and rocky outcrops in the west adjacent to the highway.

The commuter car park is located to the west of the station, on slightly higher ground and connects to the station via an overhead footbridge. The footbridge and stairs are predominantly modern concrete structures, located at the southern end of the platform. The footbridge provides elevated views to the station and the surrounding landscape.

Faulconbridge Station consists of a curved island platform and footbridge which links to Sir Henrys Parade in the east and a commuter car park to the west of the station. On the platform, the red brick federation styled building is centrally located, north of the footbridge. There are also garden areas within the platform at the northern end. The rail corridor including numerous overhead poles and the lack of planting to filter views between the station and road corridor creates some visual clutter to the west of the station.

Figure 6.2 provides of the landscape and visual features of the site.

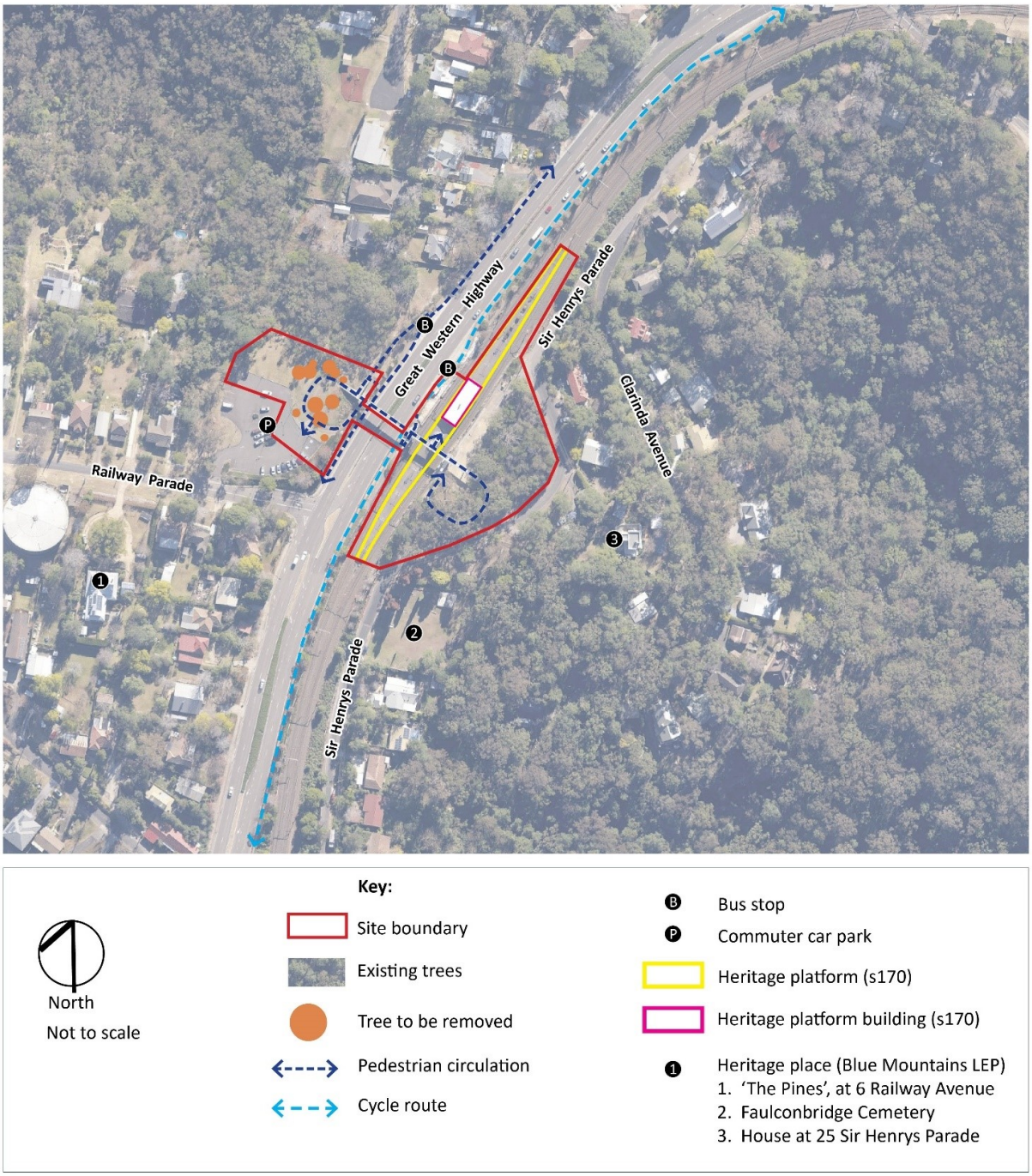

Figure 6.2 Landscape and visual features of the site

Key viewpoints

There are seven viewpoints identified for this proposal as identified in Table 6.1 and include the following:

- Viewpoint 1: View southwest from Sir Henrys Parade
- Viewpoint 2: View north from Sir Henrys Parade at Faulconbridge Cemetery
- Viewpoint 3: View south along the station platform
- Viewpoint 4: View north along the station platform
- Viewpoint 5: View south from Great Western Highway
- Viewpoint 6: View northeast from Great Western Highway

- Viewpoint 7: View northeast from the commuter car park.

The following viewpoints were selected as representative of the range of views to the site and the proposed development and are described in Table 6.1 and depicted in Figure 6.3.

Table 6.1 Summary of viewpoints

Viewpoint	Existing View	Sensitivity[1]
Viewpoint 1: View southwest from Sir Henrys Parade	This view represents a leafy view from residential properties to the east of the railway corridor and in close proximity to the station. Other views from this viewpoint include: • filtered views through dense vegetation of station platform and rail corridor • glimpses of upper section of trains and overhead wires through vegetation • eastern part of the platform building beyond the rail corridor fencing. Refer to Figure 6.4	Neighbourhood
Viewpoint 2: View north from Sir Henrys Parade at Faulconbridge Cemetery	The station is largely filtered by existing trees along the road to the east of the rail corridor. Views from this viewpoint include the following: • glimpses of concrete footbridge and curved ramp at the eastern end of the footbridge due to intervening vegetation • view of Faulconbridge Cemetery to the east including the historic grave of Sir Henry Parkes • residential properties in the background of the view through vegetation in areas north and east of the cemetery. Refer to Figure 6.5	Local
Viewpoint 3: View south from the station platform	This view along the island platform includes the platform building in the centre middle ground and overhead wiring along the rail corridor along with regularly seen trains. Other views include: • awning to both platforms of timber work and roof partially blocked by a brick wall • the existing modern footbridge and stairs extending east-west over the rail corridor and highway. • exposed sandstone cuttings to the east with informal parking area and mature trees adjacent to the rail corridor • on the west, there is a low rocky outcrop between the rail line and the highway. Refer to Figure 6.6	Neighbourhood
Viewpoint 4: View north from the station platform	This view along the station platform towards the existing modern footbridge and stairs extend east-west over the rail corridor along with overhead wiring and trains at the station. Other views include:	Local

Viewpoint	Existing View	Sensitivity[1]
	• small exposed sandstone cuttings and vegetation along the rail corridor and on the higher ground to the east of the station • the platform building is located to the north of the footbridge and largely screened by the wide curved staircase. Refer to Figure 6.7	
Viewpoint 5: View south from the Great Western Highway	The Faulconbridge Station is visible in the middle ground of this view from the footpath approaching a bus stop on the western side of the Great Western Highway. The station and highway are relatively level, both located in a small cutting exposed sandstone. Other views include: • red brick heritage listed platform building • backdrop of dense trees behind the station • highway heavily trafficked with two lanes in each direction with moving vehicles and wide road corridor visually dominant in the foreground • several vertical elements including overhead wiring and associated equipment along the rail corridor • bus stop on the eastern side of the highway adjacent to the station marked with a small shelter and signage • intermittent views of trains at the station. Refer to Figure 6.8	Local
Viewpoint 6: View northeast from the Great Western Highway	The Faulconbridge Station is visible in the middle ground of this view from the footpath on the western side of the Great Western Highway. Other views include: • a small rock cutting separating the station platform and highway. This exposed natural sandstone provides a visual feature in this view. Refer to Figure 6.9	Local
Viewpoint 7: View east from the commuter car park	View from the commuter park in which views include: • a curved, ramping pathway leading to a footbridge that connects to the station • dense bushland adjacent to the pathway • highway and station can be glimpsed through the bridge. Refer to Figure 6.10	Local

(1) Local = High quality view experienced by concentrations of residents and/or local recreational users, local commercial areas, and/or large numbers of road or rail users, e.g. view to a local heritage listed item such as Faulconbridge Cemetery.
Neighbourhood = views where visual amenity is not particularly valued by the wider community such as views from local streets, pocket parks and small groups of residences.

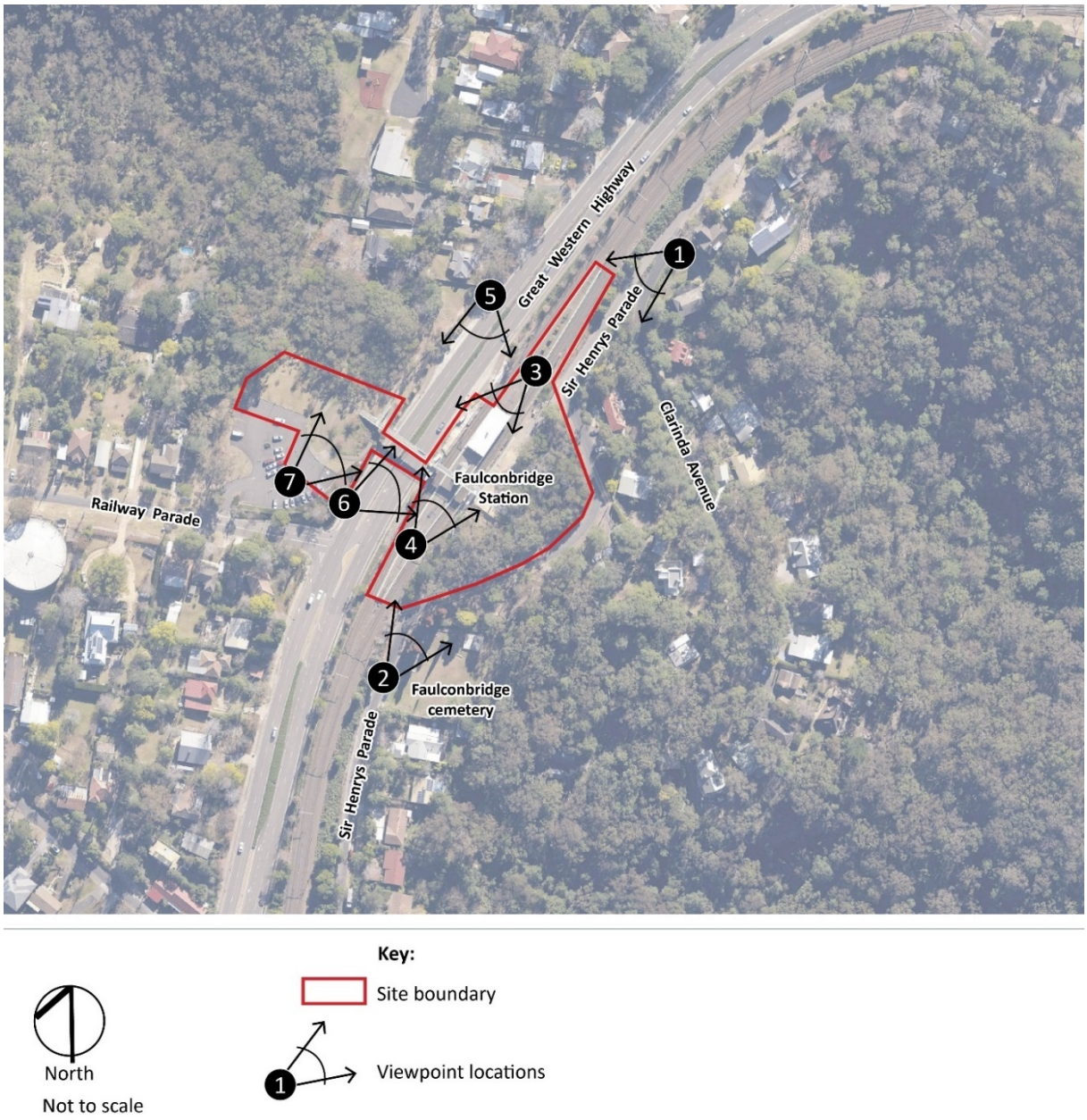

Figure 6.3 Viewpoint location plan

Figure 6.4 Viewpoint 1 – view southwest from Sir Henrys Parade

Figure 6.5 Viewpoint 2 – view north from Sir Henrys Parade at Faulconbridge Cemetery

Figure 6.6 Viewpoint 3 – view south from the station platform

Figure 6.7 Viewpoint 4 – view north from the station platform

Figure 6.8 Viewpoint 5 – view south from the Great Western Highway

Figure 6.9 Viewpoint 6 – view northeast from the Great Western Highway

Figure 6.10 Viewpoint 7 – view east from the commuter car park

6.2.2. Potential impacts

a) Construction phase

Views during daytime

Table 6.2 summarises construction impacts assessed at each of the representative viewpoint locations.

Table 6.2 Assessment of visual impacts during construction of the Proposal

Viewpoint	Assessment of visual impact	Sensitivity[1]	Magnitude	Impact rating
Viewpoint 1: View southwest from Sir Henrys Parade	The Proposal would have the following visual impacts to viewpoint 1: • construction works visible from station platform and at lift sites in the background • construction vehicles accessing the construction support site on the east of the station may be seen travelling along the roads in the foreground of the view • construction works would extend across a small portion of this view and in the middle to background of views • the character of this construction activity would contrast somewhat with the heritage and leafy character of the station.	Neighbourhood	Minor reduction	Negligible
Viewpoint 2: View north from Sir Henrys Parade at Faulconbridge Cemetery	The Proposal would have the following visual impacts to viewpoint 2: • work to install the eastern lift structure including cranes and compound near the footbridge may be visible through filtered vegetation • character of this construction activity would contrast with the heritage and leafy character of the station, the works would comprise a small portion of this view. However, construction activity within the station would be primarily screened by intervening landform and vegetation.	Local	Minor reduction	Minor adverse

Viewpoint	Assessment of visual impact	Sensitivity[1]	Magnitude	Impact rating
Viewpoint 3: View south from the station platform	The Proposal would have the following visual impacts to viewpoint 3: • platform upgrade work including brick wall work (north of platform building) and localised regrading would be seen in the foreground of this view • construction of a new lift within the platform (south of the existing footbridge) would be glimpsed in the distance, rising up above the platform building • works to construct the second lift structure (west of the station), would be seen in the middle ground of the view. These works would be visually prominent rising above the surrounding footbridge, including a range of intensive construction activities with cranes and heavy vehicles • installation works on the existing stairs and across the footbridge • visible views of construction activity across several consecutive areas • contrast with the leafy heritage character of the station due to intensive character, close proximity and extent of construction activity seen in views from the northern areas.	Local	Considerable reduction	Moderate adverse
Viewpoint 4: View north from the station platform	The Proposal would have the following visual impacts to viewpoint 4: • installation of a new lift on the platform, south of the existing footbridge also including the construction of a new landing to link the footbridge with a new lift structure • installation of the western lift north of the footbridge. This work would be seen rising above the existing footbridge, but be otherwise out of view due to the existing stairs. There would also be works to install new handrails, TGSIs and nosing on these stairs • visibility of platform upgrade works including the removal of a seat to accommodate a landing area at the base of the lift, localised regrading, installation of TGSIs and safety lines along the platform edge • site fencing and hoarding would be erected along the worksite boundary, adjacent to rail customers, and construction equipment and machinery would be visible rising above the hoarding • contrast of leafy, heritage character of the station and the character and close proximity of construction activities.	Local	Considerable reduction	Moderate adverse

Viewpoint	Assessment of visual impact	Sensitivity[1]	Magnitude	Impact rating
Viewpoint 5: View south from the Great Western Highway	The Proposal would have the following visual impacts to viewpoint 5: • installation of two new lifts, one on the platform (south of the footbridge) and the other one on the eastern side of the highway, between the bus stop and footbridge • rock excavation works would be visible in the middle ground of this view. Cranes would be seen at each lift construction site, above the rising footbridge and surrounding vegetation • platform upgrade works and brick wall related works (further north on platform) would be visible in the vicinity of platform building. Works to upgrade the handrails on the existing stairs and footbridge would extend across the view • presence of heavy vehicles travelling along the highway, accessing the site and compound via Railway Avenue Identified construction compounds and works within commuter car park are obstructed by trees to the west of the bus stop which will minimise visual impacts from the compound.	Local	Considerable reduction	Moderate adverse
Viewpoint 6: View northeast from the Great Western Highway	The Proposal would have the following visual impacts to viewpoint 6: • installation of two new lifts, one on the platform (south of the footbridge) and the other one on the eastern side of the highway, between the bus stop and footbridge • excavation of sandstone rock outcrop at the base of the stairs facing the Highway for the western lift structure • obstruction of view to heritage listed station due to lift structure work as it would rise above the footbridge creating a strong contrast with the existing station character • platform upgrade works would be visible background of this view. Handrails upgrade works on the existing stairs and footbridge would extend across the view • Negligible impacts on views of heavy vehicles travelling along the highway, accessing the site and compound via Railway Avenue as there is current traffic.	Local	Minor reduction	Moderate adverse

Viewpoint	Assessment of visual impact	Sensitivity[1]	Magnitude	Impact rating
Viewpoint 7: View east from the commuter car park	The Proposal would have the following visual impacts to viewpoint 7: • view of construction compound located on the lawn area to the north of the car park for materials storage • works to construct and install the new ramp and associated earthworks • demolished existing ramp footpath • Several trees removed on western edge of embankment • roadworks performed to upgrade kiss and ride bay and upgrade of accessible parking spaces.	Local	Minor reduction	Minor adverse

(1) Local = High quality view experienced by concentrations of residents and/or local recreational users, local commercial areas, and/or large numbers of road or rail users, e.g. view to a local heritage listed item such as Faulconbridge Cemetery.
Neighbourhood = views where visual amenity is not particularly valued by the wider community such as views from local streets, pocket parks and small groups of residences.

In summary of these viewpoints, the following are assessed visual impacts during construction:

- views from the east would have minor adverse and negligible visual impacts to residential properties as there are existing mature trees along the rail corridor screening and filtering views of the station and construction works
- views from the southern end of the platform would have moderate adverse visual impact as views of the heritage listed station building are largely obstructed by the existing footbridge and stairs. Primary views of works from this location are works from the eastern lift installation
- views from the northern end of the platform would have a primary view of the lift installation works and the compound. This viewpoint would also see changes to aspects of the station building (such as movement of the privacy screen)
- views from Great Western Highway would have moderate adverse visual impacts as prominent work in this view include activities on the station platform, footbridge, stairs and installation of new lifts. Works would be in short duration for viewers despite contrast of heritage and leafy character of the station. Views would also be prominent for cyclists and pedestrians on the western footpath and commuters waiting at the bus stops
- views from the west would have minor adverse visual impacts as although works contrast with a quiet leafy setting, a vegetated backdrop would remain maintaining existing view to the footbridge and station.

In summary, visual impacts during construction as identified and described would be temporary and short-term. Identified impacts would be managed through mitigation measures as summarised in Chapter 7.

Views at night

During construction, the work areas and adjacent main construction compound would be lit for security. However, it is unlikely that these areas would be used on an ongoing basis for construction activity during evening hours (other than for specific activities or where works are undertaken during rail possession periods). Generally, the character of any construction activities at night would be absorbed into the surrounding brightly lit environment, particularly with the context of moving headlights lights from traffic along the Great Western Highway and existing lighting at Faulconbridge station.

Potential impacts during construction of light spill into neighbouring properties is not expected as the station is separated by the rail corridor, roads and vegetation.

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

Urban design and landscape character

An area of open space north of the commuter car park would be used for a construction compound during construction. There would also be several trees within this area which would be removed and where the landform would be modified to facilitate the works. This would reduce the area of accessible open space in this location. There would also be reduced amenity and shade for pedestrians accessing the footbridge from the commuter car park.

Temporary pedestrian access arrangements and footpath diversions would potentially reduce the legibility and accessibility of the station and interchange with the bus stops on the Great Western Highway.

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

b) Operation phase

Views during daytime

Table 6.3 summarises the daytime operational impacts assessed at each of the representative viewpoint locations.

Table 6.3 Assessment of visual impacts during operation of the Proposal

Viewpoint	Assessment of visual impact	Sensitivity[1]	Magnitude	Impact rating
Viewpoint 1: View southwest from Sir Henrys Parade	No perceived change in amenity of this view due to the following: • densely vegetated setting of the station would be maintained with new station structures absorbed into the background • new eastern lift would break above the skyline contrasting in scale and form to the heritage listed platform building but would not obstruct the glimpsed view of this building.	Neighbourhood	No perceived change	Negligible
Viewpoint 2: View north from Sir Henrys Parade at Faulconbridge Cemetery	No perceived change in amenity of this view due to the following: • restricted visibility and glimpses of new eastern lift shaft through intervening vegetation • roofline of lift would rise above the footbridge but design is a simple form and palette of materials visually integrating it with the character of the existing footbridge • the vegetation surrounding the station would be retained.	Local	No perceived change	Negligible
Viewpoint 3: View south from the station platform	Noticeable reduction in the overall amenity would occur due to the following: • refurbished and refreshed platform including new brick privacy screen wall located to the north of the station platform building, closer to the viewer yet still obstructing the view of heritage building • visibility of new western lift keeping with modern footbridge but adding a strong vertical element to the bridge contrasting in scale and form with the heritage platform building • visibility of eastern lift structure with upper section of the lift rising above the existing footbridge.	Local	Minor reduction	Minor adverse

Viewpoint	Assessment of visual impact	Sensitivity[1]	Magnitude	Impact rating
Viewpoint 4: View north from the station platform	No perceived change in amenity of this view due to the following: • lift structures noted as an incremental change due to its prominent feature obstructing views to the existing station platform building • handrails would be consistent with the character of the existing character of the footbridge • preservation of existing conditions including materials of footbridge, vegetation setting and exposed sandstone cuttings. A photomontage from this viewpoint is shown in Figure 6.11.	Local	No perceived change	Negligible
Viewpoint 5: View south from the Great Western Highway	Minor reduction in amenity due to the following: • prominent views of new lifts adding to modern built character consistent with character of existing footbridge and would not block or compete with views to the heritage listed platform buildings. A photomontage from this viewpoint is shown in Figure 6.12.	Local	Minor reduction	Minor adverse
Viewpoint 6: View northeast from the Great Western Highway	Minor reduction in amenity due to the following: • prominent views of new lifts adding a modern built character with strong vertical element rising above the footbridge and skyline but maintaining character of existing footbridge • western lift would obstruct view of heritage listed platform building detracting from the prominence of heritage platform building. However, design is in keeping with the existing modern footbridge, set within the built setting of the station and adjacent to the busy highway. A photomontage from this viewpoint is shown in Figure 6.13.	Local	Minor reduction	Minor adverse

Viewpoint	Assessment of visual impact	Sensitivity[1]	Magnitude	Impact rating
Viewpoint 7: View east from the commuter car park	No perceived change in amenity due to the following: • station entry ramp and area would be reinstated to existing conditions but added with formalised landings and handrails adding minor visual elements • new accessible parking bays and kiss and ride zones would include new kerbs, footpaths with TGSIs, road line markings and signage • station additions would extend the developed character of the footbridge architecture into the commuter car park and has a high visual compatibility with the surrounding infrastructure. A photomontage from this viewpoint is shown in Figure 6.14.	Local	No perceived change	Negligible

(1) Local = High quality view experienced by concentrations of residents and/or local recreational users, local commercial areas, and/or large numbers of road or rail users, e.g. view to a local heritage listed item such as Faulconbridge Cemetery.
Neighbourhood = views where visual amenity is not particularly valued by the wider community such as views from local streets, pocket parks and small groups of residences.

In summary of these viewpoints, the following are assessed visual impacts during operation:

- views from the east would have negligible visual impacts as there would be restricted visibility of the proposal of new lift structures
- views from the north of the platform would have minor adverse visual impact from two new lift structure located on the footbridge; however, views from south of the platform would have negligible visual impact as it would be an incremental change and consistent in style and materials to the existing modern footbridge
- views from Great Western Highway would have minor adverse visual impacts due to prominent vertical elements of the new lifts viewable from the Highway; however, design is a simple form and materials are compatible with existing modern footbridge for integration of elements
- views from the west would have negligible visual impacts as the proposed station additions would extend the developed character of the footbridge architecture into the commuter car park and have high visual compatibility of the proposal with the existing infrastructure and visual enclosure and absorption capacity of this setting.

Views at night

During operations, the upgraded station would continue to be brightly lit for security and safe use at night. The new lifts and upgraded ramp beside the commuter car park at Railway Avenue would be seen in the context of the existing station and car park lighting, and streetlights along the highway. The lift structures would introduce lighting to a higher level in the vicinity of these structures, however, they are located within the station footprint and have limited visibility from surrounding residential areas.

The station would be likely to create minor additional sky glow above the site due to the additional built form. There is not expected to be any additional direct light spill (trespass) onto private property as all neighbouring residential properties are separated from the station by the rail corridor, roads and vegetation.

Generally, the character of the proposed station upgrade at night would be visually absorbed into the surrounding brightly lit environment. Overall, this would result in no perceived change in the amenity of views at night, resulting in a negligible visual impact at night during operation.

Urban design and landscape character

During operation, there would be substantial improvements to accessibility of the station precinct with the introduction of lifts within and adjacent to the station, upgrades to the footbridge and stairs, the new ramp at the commuter car park, accessible car parks, and improvements to the platform surface. The Proposal would also improve legibility through wayfinding within the station precinct. The trees and gardens removed during construction would be replaced within the precinct.

Overall, this would result in a minor improvement in the urban design functionality and landscape character of the station precinct and a minor beneficial landscape impact during operation.

Figure 6.11 Photomontage of the Proposal during operation from Viewpoint 4

Figure 6.12 Photomontage of the Proposal during operation from Viewpoint 5

Figure 6.13 Photomontage of the Proposal during operation from Viewpoint 6

Figure 6.14 Photomontage of the Proposal during operation from Viewpoint 7

6.2.3. Mitigation measures

The following mitigation measures would be implemented to reduce the visual impacts of the Proposal:

- landscape treatments and street tree planting to integrate with surrounding streetscape opportunities for public art created by local artists to be incorporated, where considered appropriate, into the Proposal
- total water management principles to be integrated into the design where considered appropriate design measures included to meet any relevant Infrastructure Sustainability Rating Scheme – Version 1.2 requirements (ISCA, 2018)
- would comply with Crime Prevention Through Environmental Design principles worksite compounds would be screened with shade cloth (or similar material), (where necessary) to minimise visual impacts from key viewing locations
- in addition, the following mitigation measures should be considered during detailed design:
    - all trees to be retained should be protected prior to the commencement of construction in accordance with AS4970 the Australian Standard for Protection of Trees on Development Sites and Adjoining Properties
    - select a colour palette and materials which are consistent with the existing modern footbridge and complementary to the heritage character of the station where possible.

Refer to Table 7.1 for more details of the mitigation measures.

6.3. Noise and vibration

This section provides a summary of the *Noise and Vibration Impact Assessment* prepared by WSP (2019) and which is attached as *Technical Paper 3*. The assessment included the following tasks:

- assessment of existing conditions from identified noise monitoring locations using unattended and operator attended noise surveys
- assessment of construction and operational noise to assess impacts
- development of mitigation measures to manage identified noise and vibration impacts.

6.3.1. Existing environment

The existing noise environment in the vicinity of Faulconbridge Station characterised by traffic from the Great Western Highway, native bush noise of birdsong, and rail traffic noise from the trains passing through the station.

Sensitive receivers

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

- residential
- commercial
- passive recreation areas.

Representative sensitive receivers are outlined in Table 6.4 and shown in Figure 6.15.

Table 6.4 Noise Catchment Area (NCA) and classification of representative receivers

NCA	Receiver Type	Address	Receiver ID
1	Residential	9 Railway Avenue, Faulconbridge	R1
	Commercial	9-9A Home St, Faulconbridge	C1
	Child Care	Children's House Montessori, 1 Russell Avenue, Faulconbridge	E1
	Active Recreation	Browett Park, 2/8 Home Street, Faulconbridge	AR1
2	Residential	24 Sir Henrys Parade, Faulconbridge	R2
	Passive Recreation	Sir Henry Parkes Grave, Faulconbridge	PR2

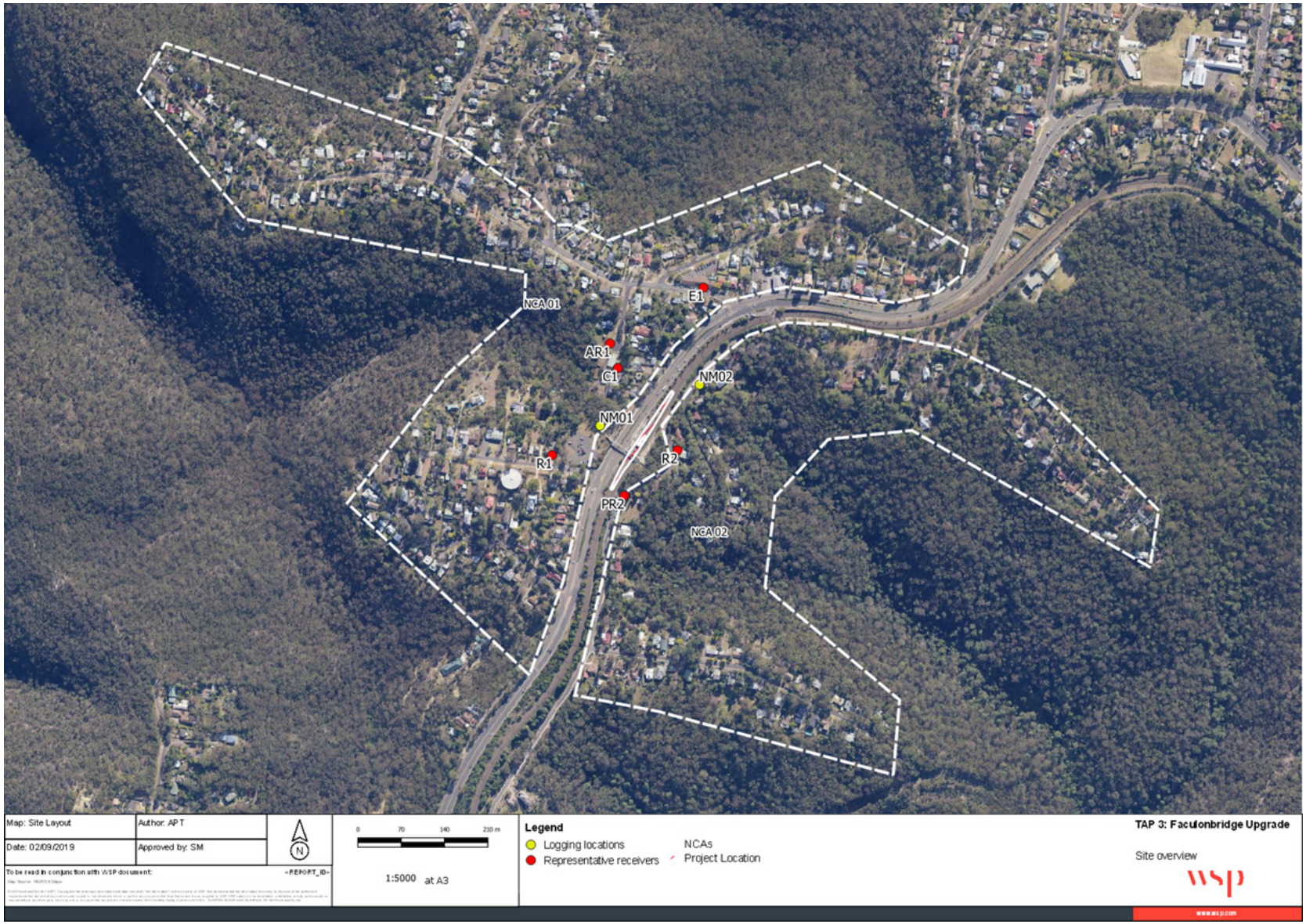

Figure 6.15 Representative sensitive receivers and noise monitoring locations

Background noise levels

Background and ambient noise levels were determined through a combination of unattended and attended noise surveys. Two noise monitoring locations (NM01 and NM02) were used to provide a representative characterisation of the long-term noise environment within the entire noise catchment area (refer Figure 6.15).

The results of the unattended noise surveys are detailed in Table 6.5.

Table 6.5 Summary of unattended noise monitoring results

Location	Rating Background Level (RBL) dBA L_{90} [1,2]			Ambient Noise Level dBA_{eq} (15 minute)		
	Day	Evening	Night	Day	Evening	Night
NM01	44	41	35	55	52	52
NM02	46	42	33	60	59	58

(1) Rating Background Level (RBL), the overall single-figure background level representing each assessment period (daytime/evening/night-time) as defined in the NPfI

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

The results of the attended noise surveys are detailed in Table 6.6, followed by relevant observations.

Table 6.6 Summary of attended noise monitoring results

Location	Time	dBA_{eq} (15 minute)	dBA L_{90} (15 minute)	Observations
NM01	3:57 pm to 4:12 pm	51	46	Birds: up to 55 dBA Car pass-bys: up to 60 dBA
NM02	3:10 pm to 3:25 pm	55	46	Birds: up to 60 dBA Car pass-bys: up to 67 dBA

The background levels for NM01 (next to Faulconbridge commuter car park) and NM02 (20 Sir Henrys Parade, Faulconbridge) were characterised by traffic from the Great Western Highway. Ambient noise levels were controlled by native bush noise of birdsong and traffic along the Great Western Highway. Train pass-bys were audible at both locations but were not recorded during the 15 minute attended measurements.

The results of the survey were used to set Noise Management Levels (NMLs) in accordance with the *Interim Construction Noise Guideline 2009* (DECC, 2009) and noise triggers for operational noise in accordance with the NPfI.

6.3.2. Noise assessment criteria

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

6.3.3. Potential impacts

a) Construction phase

Predicted noise levels

A number of activities were considered as part of the construction noise and vibration assessment. Table 3.1 provides a list of the activities details the works that would be completed during each activity and the timing of each activity.

Table 6.7 presents the predicted noise levels for the representative receivers for the key construction work activities excluding demobilisation. Maps of the predicted noise levels are provided in *Technical Paper 3 – Noise and Vibration Impact Assessment* (WSP, 2019).

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

It should be noted that, exceedances of the construction noise management levels are typical for construction projects of this scale. 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 site establishment and during platform modifications.

Table 6.8 presents the results of the maximum noise level assessment for sleep disturbance.

Table 6.7 Predicted construction noise levels[1]

NCA	RECEIVER ID	RECEIVER TYPE	NML				ACTIVITY PREDICTED NOISE LEVEL DBA $L_{EQ, 15\ MINUTE}$						
			STANDARD HOURS	OUT-OF-HOURS DAY	OUT-OF-HOURS EVENING	OUT-OF-HOURS NIGHT	ACTIVITY 1 SITE ESTABLISHMENT AND ENABLING WORK	ACTIVITY 2 LIFT WORK	ACTIVITY 3 STAIR UPGRADE	ACTIVITY 4 RAMP UPGRADE	ACTIVITY 5 COMMUTER CAR PARK UPGRADES	ACTIVITY 6 STATION BUILDING WORKS	ACTIVITY 7 PLATFORM MODIFICATION WORK
1	R1	Residential	54	49	46	40	74 *(81)*	65 (71)	66 (73)	72 *(78)*	70 *(78)*	62 (69)	66 (72)
	C1	Commercial	70	70	70	70	64 (71)	61 (67)	55 (62)	60 (66)	57 (65)	62 (69)	67 (73)
	E1	Educational	55				55 (62)	51 (57)	51 (58)	57 (63)	54 (62)	49 (56)	51 (57)
	AR1	Active Recreation	65				64 (71)	60 (66)	52 (59)	64 (70)	61 (69)	54 (61)	64 (70)
2	R2	Residential	56	51	47	38	74 *(81)*	67 (73)	69 *(76)*	63 (69)	61 (69)	69 *(76)*	72 *(78)*
	PR2	Passive Recreation	60				73 *(80)*	69 (75)	69 *(76)*	68 (74)	66 (74)	66 (73)	*84 (90)*

(1) Values in brackets indicate predicted noise levels including plant items with special audible characteristics (concrete saw, chainsaw). The orange shaded cells show exceedances of the standard-hours day period. The cells with red text show exceedances of highly noise affected noise management levels.

Table 6.8 Predicted sleep disturbance assessment[1]

NCA	RECEIVER ID	NML		ACTIVITY PREDICTED MAXIMUM NOISE LEVEL L_{MAX} DBA						
		RBL + 15 SCREENING CRITERIA	MAXIMUM NOISE LEVEL EVENT	ACTIVITY 1 SITE ESTABLISHMENT AND ENABLING WORK	ACTIVITY 2 LIFT WORK	ACTIVITY 3 STAIR UPGRADE	ACTIVITY 4 RAMP UPGRADE	ACTIVITY 5 COMMUTER CAR PARK UPGRADES	ACTIVITY 6 STATION BUILDING WORKS	ACTIVITY 7 PLATFORM MODIFICATION WORK
1	R1	51	65	82	73	74	80	78	70	74
2	R2	51	65	82	75	77	71	69	77	80

(1) Note: Values in brackets indicate predicted noise levels including plant items with special audible characteristics (concrete saw). The grey shaded cells show exceedances of the RBL + 15 criteria.

Assessment of predicted noise levels

During construction activities, the predicted noise levels indicate that construction noise could result in noise management levels exceedances and highly noise affected receivers with all activities experiencing exceedances and shown in orange highlight in Table 6.7. Sleep disturbance exceedances are shown in Table 6.8 and the grey highlight shows all activities experience exceedances. Activities occurring likely to occur during standard hours include Activities 1, 3, 4 and 6 and not likely to cause sleep disturbance.

Work is expected to take place intermittently over a 12 to 18 month period, so these exceedances would not be expected to occur continuously over the duration of the Proposal. Additionally, the predictions are based on a worst case 15 minute period, so actual noise levels from the construction site are expected to be lower than those indicated.

As noted above, the predictions are based on a worst case 15-minute period. As these predictions are conservative, and it is anticipated that the proposed works would be short term in nature, actual noise levels from the construction site are expected to be lower than those indicated. Some out of hours work would take place during rail possessions (occurring over a 48 hour period on a weekend) with around six rail possessions expected to occur over the duration of the Proposal.

In the noise assessment, concrete saws and chainsaws represent worst-case noise impacts and are not expected to be in use for the majority of the duration of construction activities.

Maximum noise level exceedances are predicted to occur during all out-of-hours work activities at both NCAs. Receiver R2 is expected to experience the greatest maximum noise level exceedances, predicted to be up to 17 dB above the sleep disturbance criteria.
For construction plant with special audible characteristics, the predicted maximum noise levels are expected to be up to seven dB higher.

Some non-residential receivers are predicted to exceed their NML. Receiver E1 is expected to exceed standard hours NMLs during activity 4. Receiver PR2 is expected to exceed NMLs during all activities. However, NMLs for C1 and AR1 are not expected to be exceeded.

All non-residential receivers were predicted to exceed NMLs. E1 and PR2 are expected to exceed NMLs during all activities with PR2 exceeding highly noise affected levels during Activities 1, 3, 6 and 7. Receiver C1 is predicted to exceed NMLs during activities 1 and 7 and AR1 during Activities 1, 2, 4, 5, and 7. NMLs only apply when these premises are in use and therefore the premises would only be impacted when it is occupied.

Approximately six 48-hour rail possession periods have been identified as part of the proposal, out of hours works will be undertaken during these rail possessions. However, as these works will only take place over up to two consecutive nights sleep disturbance impacts at residences are expected to be minimal.

Impacts would be managed and minimised where possible through the implementation of mitigation measures as referenced in Chapter 7.

Construction traffic noise

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

The numbers of construction vehicles have been estimated by TfNSW to be up to 50 light and 12 heavy vehicles per day during rail possession periods. Vehicles would access site via Sir Henrys Parade and Railway Avenue.

Overall, it is expected that construction traffic along both Sir Henrys Parade and Railway Avenue would comply with RNP criteria.

Vibration

Certain construction activities would require the use of vibration intensive equipment that may affect the nearest sensitive receivers. The vibration intensive plant nominated as part of the work is jack hammering, vibratory rolling, piling and the use of a hydraulic hammer (Activities 3, 4, 5 and 7 – stair upgrade, interchange upgrades, station building works, platform modification works).

Minimum working distances for vibration intensive plant have been outlined in Table 5.11 in *Technical Paper 3 – Noise and Vibration Impact Assessment* to comply with human comfort and cosmetic damage vibration limits. If minimum working distances are complied with, no adverse impacts are expected for cosmetic damage or human response on nearby sensitive receivers. All receivers are outside the minimum working distance of one metre.

b) Operation phase

The operation of Faulconbridge Station would remain unchanged as a result of the Proposal. There would be no expected changes to the operation of the rail network as a result of the Proposal. New plant and equipment associated with the upgrade to Faulconbridge Station would include two new lifts and provision of a family accessible toilet.

Operational noise emissions from the Proposal to surrounding noise sensitive areas are assessed according to the NPfI. Intrusive, amenity and sleep disturbance noise impacts are taken into consideration based on the NPFI to assess the impact of industrial noise impacts.

For operational phase, the mechanical plant selections have not yet been finalised. However, it is not expected that the mechanical noise emissions would have a significant impact on the surrounding environment. Any mechanical plant noise would be reduced to acceptable levels with the use of standard controls. All operational noise from the Proposal would need to be designed to meet the NPfI noise goals. Operational noise would not be noticeably different to what is currently experienced.

6.3.4. Mitigation measures

The following mitigation measures are proposed with respect to potential noise and vibration impacts (refer to Chapter 7.1 for more details):

- where the $L_{Aeq\ (15minute)}$ construction noise levels are predicted to exceed 75 dBA and/or 30 dB above the Rating Background Level at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with the CNVS. This would include restricting the hours that very noisy activities can occur
- 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 (WSP, 2019) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged. This would include undertaking a pre-construction building condition survey of heritage structures and require minimum working distances to be confirmed prior to carrying out any vibration intensive work on site
- during site establishment (Activity 1), temporary barriers could be erected to ensure that work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of sensitive receivers to ensure that ‘line of sight’ is broken, where feasible. This has the potential to reduce noise levels between five and 10 dB
- during lift, station building works (Activities 2 and 5), use of the concrete saw is the main contributor to construction noise. The concrete saw is a particularly loud construction plant item which produces a noise the CNS identifies as having ‘special audible characteristics’ and incurs a +5 dB penalty. Without the concrete saw, the total activity noise level is reduced by 6-8 dB. It is recommended that the use of these plant items is limited where

possible, and works are undertaken during standard hours and avoid sensitive time periods. Where work is required outside of standard hours, the use of this equipment is to avoid sensitive periods such as after midnight and before 7:00 am

- due to the exceedances during Activity 4 of construction at the educational receiver E1 (Children's House Montessori) where possible, it is recommended that a temporary screen or enclosure (10 – 15 dB reduction) is placed around the works in conjunction with temporary barriers. This receiver is more likely to be more sensitive during certain times of the day. Therefore, further consultation should be undertaken to determine feasible construction periods and inform construction staging with respect to minimising the impacts on receiver E1. As much as reasonably possible, noise intensive construction works near affected education buildings are to be minimised. It is also recommended that where reasonable and feasible the use of the concrete saw is limited to standard hours or when the premises are not in use (e.g. between 7am and 9am, and 5pm and 6pm or during school holiday periods), to minimise the impact on this receiver
- new mechanical plant must comply with NPfI during operation.

6.4. Aboriginal heritage

6.4.1. Existing environment

A search for known Aboriginal heritage items in the vicinity of Faulconbridge Station (plus a 200 metre buffer) was undertaken on 10 September 2019 using the Aboriginal Heritage Information Management System (AHIMS) database. The AHIMS search did not identify any known Aboriginal heritage items within or close to Faulconbridge Station.

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

6.4.2. Potential impacts

a) Construction phase

Construction of the Proposal would involve some minor excavation and other ground disturbing activities, particularly for the foundation and pits for the two new lifts. Ground disturbing activities have the potential to impact Aboriginal sites, if present. However, as no known Aboriginal heritage items are located in the vicinity of the Proposal, no high risk landscape features are located at or near the Proposal area, and no significant excavations are proposed, it is unlikely that the Proposal would affect Aboriginal heritage during construction.

b) Operation phase

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

6.4.3. Mitigation measures

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measure with respect to potential Aboriginal heritage impacts.

6.5. Non-Aboriginal heritage

This section provides a summary of the *Statement of Heritage Impact* (SoHI) prepared by Artefact Heritage (2019). The methodology used to undertake this assessment is provided in *Technical Paper 4* as well as details on the review of scope of works by Sydney Trains heritage under the s170 consultation process.

6.5.1. Existing environment

Historical background

Faulconbridge Station

Early settlement and land use in Faulconbridge centred around land cultivation and establishment of large estates. The first railway station at Faulconbridge was established in 1867 and comprised of a simple platform on the southern side of the Main Western Line. This first Faulconbridge station was later removed and replaced with a brick island platform and Federation Style station building to accommodate the duplication work of the Main Western Line in the early twentieth century. Several renovations continued from the 1990s until today including construction of a brick privacy wall at the entrance to the men's toilets, installation of ramp, platform resurface/upgrade, new platform furniture and electrical upgrades for lighting and CCTV systems, forming the modern Faulconbridge Station.

Listed heritage items

The desktop search of relevant non-Aboriginal heritage registers on 3 August 2019 did not identify any heritage items listed on the World, Commonwealth or National Heritage Lists, the Register of the National Estate or State Heritage Register within proximity of the Proposal.

There are four heritage items listed in the Blue Mountains LEP and one item on the NSW Transport RailCorp Section 170 Register in the vicinity of the Proposal (outlined in Table 6.9 and shown on Figure 6.16.

An assessment and/or statement of significance for each of these heritage items is provided in *Technical Paper 4 – Statement of Heritage Impact (SoHI)*.

Archaeological potential

Determining the significance of heritage items or a potential archaeological resource is undertaken by utilising a system of assessment centred on the Burra Charter of Australia International Council on Monuments and Sites (ICOMOS). Full details of the archaeological methodology are in *Technical Paper 4 – Statement of Heritage Impact (SoHI)*.

There is no to low potential presence of archaeological resources; impacts assessed are further described in Section 6.5.2.

Figure 6.16 Heritage items within the vicinity of Faulconbridge Station

Table 6.9 Heritage items in the vicinity of Proposal

Item	Address	Listing and Item Number	Significance	Distance from the Proposal
Faulconbridge Railway Station	444 Great Western Highway, Hazelbrook, NSW, 2776	Blue Mountains LEP 2015 (Item No. FB005)	Local	Within
Faulconbridge Railway Station Group	444 Great Western Highway, Hazelbrook, NSW, 2776	NSW Transport RailCorp s170 (SHI listing no. 4801064)	Local	Within
Faulconbridge Cemetery—Sir Henry Parkes' grave	25A Sir Henrys Parade, Faulconbridge, NSW, 2776	Blue Mountains LEP 2015 (Item No. FB012)	Local	Approximately 73 metres south of the study area
The Pines	6 Railway Avenue, Faulconbridge, NSW, 2776	Blue Mountains LEP 2015 (Item No. FB015)	Local	Approximately 160 metres southwest of the study area
House	25 Sir Henrys Parade, Faulconbridge, NSW, 2776	Blue Mountains LEP 2015 (Item No.FB016)	Local	Approximately 62 metres east of the study area

Two of the heritage items listed in Table 6.9 are within the Faulconbridge Station, adjacent to the Great Western Highway. The other three heritage items locate either in Railway Avenue or Sir Henrys Parade.

The following statement of significance has been sourced from the SHI database listing for the Faulconbridge Railway Station Group.

> *"Faulconbridge Railway Station is of local significance as an early 1870s railway station that was built in direct association with the former Premier of NSW, Sir Henry Parkes, following his selection of the area for his residence. The station has been providing railway services to the locality for more than 130 years, with its current configuration demonstrating duplication of the Western line in 1902. Faulconbridge station building is a good and intact example of a common type of island platform building demonstrating standard railway design of the early 20th Century. Set within a small rock cutting and landscape surrounds, the station forms an important part of the Faulconbridge historic townscape."*

Different features of the Faulconbridge 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 Faulconbridge Station has been assessed as follows (refer to *Technical Paper 4 – Statement of Heritage Impact (SoHI)*):

- high – platform station building (external), platform station building (internal), island platform and coping
- moderate – rock cutting
- little – footbridge and stairs.

6.5.2. Potential impacts

a) Construction phase

Assessment of construction impacts

Table 6.10 outlines the potential direct (physical) and indirect (visual) of the work upon the heritage significance of Faulconbridge Station. Refer to *Technical Paper 4 – Statement of Heritage Impact (SoHI)* for the full details of each impact.

Table 6.10 Potential construction impacts to heritage associated with the Proposal

Component	Assessment
Lift access between the footbridge and the Great Western Highway	This component of the works would involve: • removal of some sections of the existing balustrade and view deck of the footbridge • removal of existing rock cutting • construction of the new lifts and landing structure. As the rock cutting for Faulconbridge Station is considered to be moderate heritage significance value Installation of new lift and walkway would result in a minor direct (physical) impact to the heritage significance of the Faulconbridge Railway Station Group. Indirect (visual) heritage impacts from lift works would result in a minor indirect (visual) heritage impact because the overshadowing of the new lifts and walkway structure would be largely screened and reduced by the footbridge. Works related to balustrade and footbridge would likely result in a minor indirect (visual) heritage impact.
Lift access between the footbridge and the station platforms	This component of the works would involve: • removal of some sections of the existing balustrade and view deck of the footbridge • construction of the new lifts and landing structure. Installation of the new lift and landing structure would result in a negligible direct (physical) impact to the heritage significance of the Faulconbridge Railway Station Group. Indirect (visual) heritage impacts from lift works would result in a minor indirect (visual) heritage impact because the overshadowing of the new lifts and walkway structure would be largely screened and reduced by the footbridge. Works related to balustrade and footbridge would likely result in a minor indirect (visual) heritage impact
Ramp and car park modifications	This would involve removal and relocation of the existing car park ramp to the west of the station platform. As the existing ramp, car spaces and associated elements are not considered significant. These works would not noticeably alter the visual setting of the car park area and Railway Avenue. These works would therefore not result in adverse indirect (visual) heritage impacts to the Faulconbridge Railway Station Group.
Platform modifications	Works would involve: • potential relocation of seating benches on Platforms • installation of a new bubbler • platform regrading • removal of three garden beds. Impacts are assessed to be minor direct (physical) heritage impact.

Component	Assessment
Internal modifications to platform station building: • conversion of women's toilet to ambulant toilet • installation of main switchboard (IMSB) cabinet • modification of waiting room • installation of library bookshelf in waiting room • construction of new family accessible toilets in existing men's toilet • removal of existing concrete slab south-east of the existing men's toilets.	Works and associated impacts may include: • conversion of women's toilet to ambulant toilet would involve the removal of existing toilets, tiling and finishes and the installation of new tiling and toilet amenities. Impacts would result in minor direct (physical) heritage impacts. • construction and installation of a new IMSB cabinet would have minor direct (physical) impact to Faulconbridge Station depending on the degree of required penetration to fixings to install the IMSB cabinet) • modification of waiting room also includes introduction of a wheelchair space and would require the removal of one or both seating. Impacts for this work is a minor direct (physical) impact • modification of waiting room works include internal and external widening of the waiting room entrance including removal of the original brickwork and timber framing with potential to modify the original glass transoms above the doorways. Impacts are assessed as moderate direct (physical) impacts • installation of library bookshelf situated within the waiting room and does not consist of heritage fabric. No location has been proposed and impact was not assessed • Family Accessible Toilet modification works may involve impacts to structural elements located behind finished and floor lowering works would involve result in impacts to existing door thresholds and door architecture Impacts are minor direct (physical) impact to heritage significance of the building • relocation of existing modern brick privacy wall (would not result in any impacts to significant original fabric) as the wall is a representation of the original heritage privacy wall. Indirect (visual) heritage impacts for works related to modifying the toilets would result in negligible indirect (visual) impacts as the proposal would not alter the aesthetic character. For installation of the IMSB cabinet, impacts would be a minor indirect (visual) heritage impact. For modifications to the waiting room, the indirect (visual) heritage impact would be minor to moderate.
External modifications to platform station building: • construction of proposed awning • replacement of privacy wall.	• construction of proposed awning over the entrance to the new Family Accessible Toilet (existing men's toilet) would involve no new penetrations or fixings to the existing brickwork and installed at a distance of two metres away from the existing wall. Impacts would result in a neutral direct (physical) impact • removal and replacement of brick privacy wall with canopied privacy wall would continue to promote the legibility and integrity. Impacts are assessed as a neutral direct (physical) impact • indirect (visual) heritage impacts for works on the replacement of privacy wall would have negligible to minor indirect (visual) impacts.
Utility services works	Works and associated impacts include new in-platform and above-ground services. Location, depth and configuration of any service conduits would be developed during detailed design. Direct and indirect impacts would be assessed in further assessment in detailed design.

Overall, the construction of the Proposal would have neutral to moderate direct (physical impact) and negligible to minor indirect (visual) impact to the heritage significance of the Faulconbridge Station. The Proposal would not result in any direct (physical) impacts to heritage listed items surrounding the Proposal. However, the proposed works may result in a negligible indirect (visual) impact to the heritage significance of nearby three heritage listed items.

No significant archaeological resources have been identified in the study area. Project works would therefore not impact any significant archaeological remains.

b) Operation phase

The Proposal would result in a new visual elements associated with the new lifts and canopy structures introducing modern features. In review, this may result in a negligible visual impact to *Blue Mountains LEP 2015* listed heritage items surrounding the Proposal, as their view to the station would be disrupted, including:

- Faulconbridge Cemetery – Sir Henry Parkes Grave (Item FB012)
- The Pines (Item FB015)
- House (Item FB016).

The locations of the utility services and signage work associated with the Proposal would be confirmed during detailed design. Any above ground features associated with utilities or signage may alter the existing nature of the station platforms, be installed along the walls of the building and/or obstruct detailing (brickwork, timber sills and lintels). This may result in moderate direct (physical) impacts to Faulconbridge Railway Station Group.

6.5.3. Mitigation measures

The following mitigation measures are proposed with respect to potential non-Aboriginal heritage impacts:

- options for the use of transparent materials for the proposed anti-throw screens on the new walkway structure should be considered during detailed design. Partially transparent materials such as metal mesh may not occlude heritage significant views from the perspective of the footbridge, however from further distances these screens would appear opaque and block views. Material schedules to be provided during detailed design would require further heritage impact assessment by the project's appointed heritage consultant during later design stages
- during regrading works at the northern extent of the platform, heritage significant garden beds should be reinstated at their present locations following the completion of works:
    - if there is insufficient room to meet platform clearances at their current location, it is recommended that these are relocated to a new location
    - alternatively, new garden beds should be provided to offset the loss of those that would be removed for the installation of a compliant access path along the station platform, in line with the TfNSW *Vegetation Offset Guideline* (2019c)
- the regrading works for the platform should avoid impacting existing door thresholds and any elements of former station architecture (such as buried boot scrapers) of the station platform building. Platform regrading works must avoid impacting the significant brick retaining wall coping of the platform edges
- the removed platform seating should be appropriately reinstated along the platform. The existing platform bubbler located against the western wall of the station master's room should be conserved and protected *in situ* during works
- it is recommended that during detailed design that cladding and material finishes for the proposed lift be as lightweight and recessive as possible to ensure that adverse visual impacts to Faulconbridge Station are minimised
- it is recommended the proposed canopy design for the Family Accessible Toilet entrance should incorporate slim, lightweight and transparent materials in order to prevent the loss of significant views or detailing. The proposed canopy should require a minimum amount of penetrations or modifications of significant heritage fabric, and should avoid

penetrations or fixings into areas of significant detailing (such as timber bargeboards and finials, brackets, awnings or decorative sills). Final designs for the canopy structure should be incorporated into future detailed design heritage impact assessment

- in order to mitigate any impact upon the entrance and façade of the building, it is recommended that the existing brick and stonework located at the entrance to the men's toilets be protected during the demolition and construction phase
- during the installation of fireproof walls and ceiling in the new MSB room, penetrations on decorative fabric (skirting boards, lintels, cornices) should be avoided to minimise irreversible harm to elements of high heritage value
- removal of existing tiling and finishes from the existing men's and women's toilets should be conducted with care to avoid damaging original walls and detailing underneath which are heritage fabric. The reinstallation of tiling and finishes in these rooms should endeavour to use existing penetrations and fixing points to minimise harm to the original brick fabric located underneath
- the current scope of works includes a variety of works to built and movable heritage items within the waiting room. Detailed design should provide final drawings which require heritage impact assessment from a suitably qualified heritage advisor who has been appointed to the project. The following design and mitigation measures are recommended during the development of detailed design:
    - final drawings are to depict the proposed widening of the doorways in both plan and elevation and indicate the amount of material (brickwork, timber door frame, skirting boards etc) to be removed from these openings. Any works to these areas should be minimal and sympathetically designed to contribute to the heritage significance of the platform building
    - final drawings are to indicate whether existing floor levels need to be raised or lowered during works. Should the existing floor require modification to a new level, original timber joists and floorboards should be carefully removed and reinstated at the new level. Modifications to the floor of the waiting room should endeavour to remove linoleum finishes on the floor and restore the timber floorboards to their original condition
    - final drawings may indicate the removal of the existing movable heritage items within the waiting room (seating). It is recommended that the conservation of the timber benches within the waiting room be considered, in order to contribute to the heritage interpretation of the room and the station overall. Any removed seats should be safely stored onsite to prevent loss of the item and its contextual significance. Train destination indicators currently on display in the waiting room are also items of moveable heritage and should be conserved in the room. Should timber seating be removed, any seats should be removed intact and accessioned into the Sydney Trains Heritage movable heritage collection, and long term use and storage options for the seating developed in consultation with Sydney Trains Heritage
    - final drawings should be provided to depict the construction of the new waiting room library bookshelf. Any new furniture should not block or obscure the existing fireplace, which is an original architectural feature of the room of heritage significance. Should new library structures require attachment to existing walling, existing insignificant penetrations from current furniture should be utilised as much as possible to minimise the need for new penetrations
    - a schedule of movable heritage objects in the waiting room should be prepared in consultation with Sydney Trains. The schedule of objects would be prepared prior to commencement of works and provide guidance in accordance with the Sydney Trains Movable Heritage Strategy on the temporary and long-term curation of these items

- new tiling to be installed on original fabric should also be affixed and grouted with care to prevent long-term damage to underlying brickwork. Original decorative features (such as skirting boards and cornices) that are to be overlayed with tiling should be physically protected prior to the installation of tiling
- the installation of the IMSB cupboard in the women's waiting room should be painted and matched to existing colour schemes within the room, to ensure that the cupboard would be visually recessive within the space. Fixings and penetrations to install the IMSB cupboard should minimise damage to original physical fabric of the room and should avoid all areas of significant detailing
- proposed platform regrading should not cover over or obscure original sub-floor ventilation grates of the platform building. Should platform elevations be adjusted that may cover grates, a small cavity should be provided in the platform surface near the grates so that they can continue to allow air flow to freely ventilate
- above ground conduit installation and modifications to existing telephone and help points should endeavour to use existing penetrations and entry points to structures. Conduits should not cover significant fabric or areas of detailing wherever possible. Conduits and conduit casings should not introduce large noticeable structures or items in areas of significant detailing or within significant view lines. During detailed design, conduit works should adhere to the principles and guidelines outlined in the Sydney Trains Heritage *Technical Note, Installation of New Electrical and Data Services at Heritage Sites* (Sydney Trains, 2017) to prevent minor cumulative impacts to fabric from occurring due to ad hoc conduit design solutions. Conduit design solutions should avoid ad hoc solutions which can cause further direct and indirect impacts to heritage significant fabric
- a Photographic Archival Recording (PAR) should be prepared for the station, in accordance with the *Photographic Recording of Heritage Items Using Film or Digital Capture* (NSW Heritage Office, 2006)
- the SoHI has been prepared for supporting the REF for the determination of the concept design of the project. Detailed design would be developed post determination approval, and new works or significant changes to station building design would require further heritage assessment and possible approval
- a suitably qualified heritage practitioner must be engaged during detailed design to provide heritage advice and input into developing design phases, and to oversee heritage sensitive works at Faulconbridge Station
- should new works not detailed in the scoping design be proposed during detailed design, these new works should be assessed by a suitably qualified heritage practitioner who has been engaged for the project for adverse heritage impacts. New or increased adverse heritage impacts may require further approval from TfNSW and consultation with Sydney Trains Heritage as required
- a copy of this SoHI report should be provided to Sydney Trains for their review and comment
- under ISEPP provisions, TfNSW should provide a copy of the complete SoHI to Blue Mountains City Council for their comment
- following the completion of the detailed design process, further heritage assessment would be required to confirm the degree of adverse heritage impacts from the project works. Should detailed design indicate that significant fabric would be demolished or removed, TfNSW may need to complete a Sydney Trains s170a notification for Sydney Trains to review and sign as landowner delegate
- consideration should be given to the provision of interpretation as part of the project, which would outline the history, associations and significance of Faulconbridge Station and the wider Faulconbridge area. Interpretive measures could involve interpretive

signage, panels or displays at entry/exit points to the station, including in the existing waiting room and on the proposed lift and walkway structure and would be considered during detailed design.

Based on the Proposal, a notification under Section 170A of the Heritage Act would be required to Heritage Division of the EES by Sydney Trains. formerly OEH) at least 14 days prior to commencement of works.

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

6.6. Biodiversity

6.6.1. Existing environment

This section provides a summary of the *Biodiversity Assessment Report* (*Technical Paper 5*) prepared by WSP (2019) and the *Arboricultural Impact Assessment* (*Technical Paper 6*) prepared by Earthscape Horticultural Services (2019), which included a desktop assessment, literature review and site inspection of the study area. The detailed methodologies for the *Biodiversity Assessment Report* and the *Arboricultural Impact Assessment* are provided in *Technical Paper 5* and *Technical Paper 6* respectively.

Vegetation communities

Two vegetation communities were recorded within or adjacent to the study area during field survey and comprise of one native vegetation type and one non-native vegetation type. A description of each vegetation community is provided below.

Highly disturbed areas with no or limited native vegetation

This non-native vegetation community occurs over most the Proposal area with all associated works being located wholly within this vegetation type. The vegetation comprises of ornamental landscape plantings, exotic lawn, opportunistic regrowth and environmental weeds.

On the western of the station the proposed upgrade of the existing footbridge over the Great Western Highway several small immature native trees that are considered opportunistic regrowth occur (Figure 6.17). These trees include: *Acacia parramattensis* (Parramatta wattle), *Corymbia gummifera* (Red Bloodwood), *Eucalyptus sclerophylla* (Hard-leaved Scribbly Gum) and *Syncarpia glomulifera* (Turpentine) along with a specimen of *Acacia longifolia subsp. longifolia* (Sydney golden wattle) (Figure 6.18). Other include *Quercus robur 'Fastigiata'* (Columnar English Oak), *Quercus palustris* (Pin Oak) and planted ornamental trees *Acer palmatum* (Japanese Maple) (Figure 6.19).

On the eastern side of the station all works would be restricted to this highly disturbed area with the proposed eastern compound area wholly utilising existing cleared areas (Figure 6.20).

Figure 6.17 Proposed western compound area that would utilise existing exotic lawn area

Figure 6.18 Proposed eastern compound area that would utilise existing cleared area

Figure 6.19 Scattered opportunistic regrowth native trees on the western side of the station near the proposed upgrade of the existing footbridge

Figure 6.20 Scattered ornamental plantings near the commuter car park on the western side of the station

PCT 1081 Red Bloodwood – Grey Gum Woodland on the edges of the Cumberland Plain, Sydney Basin Bioregion

This native vegetation community was recorded to occur adjacent to the Proposal on both the east and west sides of the station. The vegetation exhibits an open forest structure dominated by *Acacia parramattensis* (Parramatta wattle), *Allocasuarina littoralis* (Black She-oak), *Corymbia gummifera* (Red Bloodwood), *Eucalyptus oblonga* (Sandstone Stringybark), *Eucalyptus punctata* (Grey Gum), *Eucalyptus sclerophylla* (Hard-leaved Scribbly Gum) and Syncarpia glomulifera (Turpentine). A shrub layer dominated by *Acacia longifolia subsp. longifolia* (Sydney golden wattle), *Kunzea ambigua* (Tick Bush) and *Pittosporum undulatum* (Sweet Pittosporum) also occurs.

Based on floristic, geographic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 1081 Red Bloodwood within BioNet Vegetation Classification (Office of Environment & Heritage 2019).

PCT 1081 does not form part of any listed threatened ecological community under either the BC Act or EPBC Act.

On the western side of the station, this vegetation type occurs to the north of the proposed construction compound (Figure 6.21) whilst on the eastern side of the station it occurs to the south and east of the proposed compound and is bordered by Sir Henrys Parade (Figure 6.22).

Figure 6.21 A patch of PCT 1081 on the western side of the station

Figure 6.22 PCT 1081 on the eastern side of the station showing Eucalyptus sclerophylla (Hard-leaved Scribbly Gum) in the foreground and flowering specimens of Acacia parramattensis (Parramatta wattle)

Fauna habitats

The fauna habitat within the study area is limited, with majority of vegetation in the form of planted ornamental native and exotic trees and shrubs.

Much of the original vegetation within the Proposal study area has been cleared for rail infrastructure and urban development and what remains is landscape gardens, plantings and minor native regrowth. The habitat and vegetation within the study area provides limited resources and lacks important features such as hollow bearing trees, rocky outcrops, dense litter layer or fallen woody debris. None of these trees contain cavities that would be suitable as nesting hollows for arboreal mammal or birds.

The Proposal study area does not provide any significant habitat for fauna and species likely to utilise resources are those that are well adapted to urban environments or those species that are highly mobile (i.e. birds and bats). The surrounding trees (both native and introduced) provide some foraging habitat (i.e. fruits and blossom) for mobile species (i.e. birds and bats). There is some evidence of sugar glider feeding on one of the native trees. It is unlikely that these resources are heavily utilised or relied upon by majority of fauna but instead are intermittently used whilst foraging within the greater locality.

Weeds

No Priority Weeds listed under the *Biosecurity Act 2015* for the Greater Sydney Region were identified in the Proposal study area.

Threatened biodiversity

Threatened Ecological Community

No threatened ecological communities were identified within the study area. All vegetation observed within the Proposal study area comprised of ornamental planted exotic and native garden specimens that do not form part of any recognised native NSW Plant Community Type.

Threatened Flora

No threatened flora was identified during site inspections. Background investigations identified 28 threatened flora species listed under the BC Act and/or EPBC Act that were considered to have the potential to occur within the locality of the Proposal study area (*Biodiversity Assessment Report* in *Technical Paper 5*). Following field surveys, it is considered that the Proposal study area is unlikely to provide habitat to threatened flora species.

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

Threatened Fauna

No threatened fauna species were identified during site inspections. Background investigations identified 35 threatened fauna species listed under the BC Act and/or EPBC Act that have been previously recorded or have the potential to occur within the locality (see *Biodiversity Assessment Report* in *Technical Paper 5* for further details). The likelihood of these species occurring within the study area was determined based on field investigations and fauna habitat available. The Proposal would not provide any significant habitat for these species.

Migratory species

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

A total of five species listed as migratory under the EPBC Act were identified during background investigations that have been previously recorded or have the potential to occur within the locality (*Biodiversity Assessment Report* in *Technical Paper 5*). Of these, no species are considered likely to utilise the habitat present within the Proposal study area.

The habitats within the Proposal study area are unlikely to constitute important habitat for any of the listed species. The habitat present is unlikely to support significant proportions of the population of any migratory species, nor are the habitats critical to any life stage of these species. Due to their mobile nature, the mentioned species are likely to utilise higher quality habitat within the greater locality and where more extensive tracts of native vegetation occur.

6.6.2. Potential impacts

a) Construction phase

Direct impacts

Direct impacts to biodiversity as a result of the Proposal are considered negligible due to the existing disturbed nature of the available habitat and the nature of the construction works to be undertaken. Vegetation clearing would be minimal and limited to 11 trees including six exotic ornamental trees and five native trees Exotic ornamental tree species included *Acer palmatum* (Japanese Maple) and *Quercus palustris* (Pin Oak). Native tress recorded included *Corymbia gummifera* (Red Bloodwood) and *Eucalyptus sclerophylla* (Hard-leaved Scribbly Gum). The species recorded as of a young age cohort and do not bear hollows.

Direct mortality or trauma to fauna is also expected to be minimal as habitat to be removed is of low quality (i.e. planted native trees and landscape gardens).

Impacts to threatened fauna

No threatened fauna is likely to be significantly impacted by the Proposal. It is unlikely that any threatened fauna identified within the locality would have a moderate to higher likelihood to utilise the habitat within the study area. It is also unlikely for any threatened fauna to rely on

the habitat to be removed or impacted. The mitigation measures outlined below in Section 7 would ensure that any possible indirect impacts would be minimised.

Removal of vegetation

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

The proposed development would necessitate a removal of the following 11 trees:

- six trees of low and very low retention values:
    - Native Tree ID: T19, T22 (*Corymbia gummifera* [Red Bloodwood]) and T20 (*Eucalyptus sclerophylla* [Hard-leaved Scribbly Gum])
    - Exotic Tree ID: T13, T14, T25 (*Acer palmatum* [Japanese Maple]).
- five trees of moderate retention values:
    - Native Tree ID: T18, T21 (*Corymbia gummifera* [Red Bloodwood])
    - Exotic Tree ID: T15, T16, T17 (*Quercus palustris* [Pin Oak]).

These trees either located within the Road Reserve or Public Reserve as shown in Figure 6.23.

These trees are considered of very low ecological value and do not from part of part of any threatened ecological community or important habitat for threatened species. Refer to *Arboricultural Impact Assessment* report in *Technical Paper 6* for the location of these trees identified for removal.

None of the six trees of low and very low retention values are considered significant or worthy of special measures to ensure their preservation. The removal of these trees to accommodate the proposed development is therefore considered warranted in this instance. T14 and T25 (*Acer palmatum* [Japanese Maple]) are exempt from Council's Tree Management Controls.

None of the five trees of moderate retention values are considered to have special ecological or heritage significance, but are all in good health and condition and contribute positively to the amenity of the site especially trees T15, T16 and T17 (*Quercus palustris* [Pin Oak]). As the above five trees make contributions to the amenity of the streetscape, mitigation measures and offset requirements would be considered for these trees to accommodate for loss of amenity including replacement planting for the trees to be removed within the site. Other construction activities would also occur within the tree protection zones (TPZ) or adjacent to the TPZs of other trees. Majority of this work would not result in any adverse impacts on the trees on site, provided the mitigation measures outlined in Section 6.6.3 are implemented.

Following trees should be protected prior to and during construction from all activities that may result in detrimental impacts by erecting a suitable protective fence:

- Native Tree ID: T23, T24 (*Eucalyptus sclerophylla* [hard-leaved Scribbly Gum]), T27, T28 (*Eucalyptus haemastoma* [Scribbly Gum]).

On the eastern side of the station, all works would be located within existing disturbed areas and would not result in vegetation removal. Impacts on the eastern side would be limited to tree pruning at most and unlikely to pose any long-term impact on existing biodiversity values.

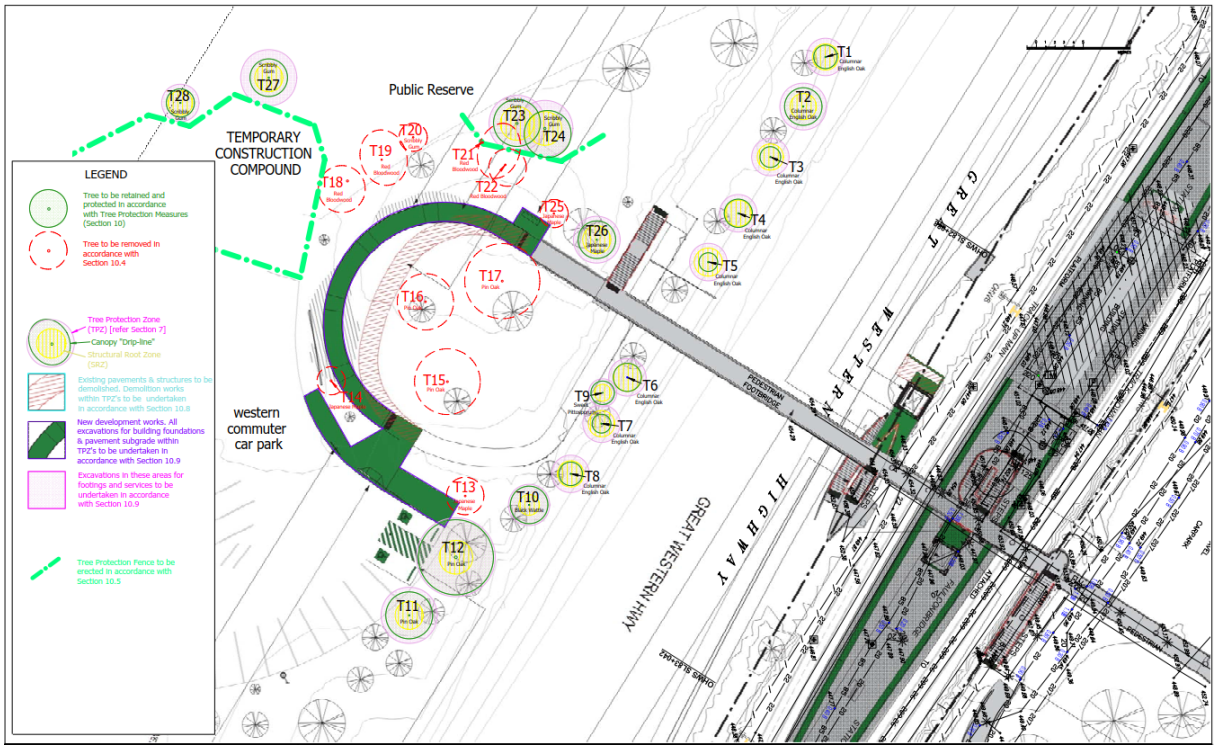

Figure 6.23 Tree removal near proposal

Potential environmental impact of noise, light and vibrations on wildlife

Many animals detect and depend on sound to communicate, navigate, evade danger and find food, but human-made noise can alter the behaviour of animals or interfere with their normal functioning (Bowles, 1997). In some cases this can harm their health, reproduction, survivorship, habitat use, distribution, abundance, or genetic composition (Forman *et al*. 2000). However, variation in ambient noise, such as from wind or other animals, is part of the natural environment and many animals display behavioural adaptations to this variation. For example, certain species of frogs avoid vocalising during loud calling by cicadas or other frogs and some species would time their calls during brief periods of silence (Schwartz & Henderson, 1991).

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

Under present conditions there is moderate light pollution within the study area associated with the Faulconbridge train station and car park. The increase of lighting during the construction and operation of the proposal is likely to be inconsequential and significant ecological light pollution impact to wildlife is unlikely. Refer to *Biodiversity Assessment Report* in *Technical Paper 5* for more details.

Weeds

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

Conclusion on construction impacts

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

b) Operation phase

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

6.6.3. Mitigation measures

Construction of the Proposal must be undertaken in accordance with TfNSW's *Vegetation Management (Protection and Removal) Guideline* (TfNSW, 2019d, TfNSW's *Fauna Management Guideline* (TfNSW, 2019e) and TfNSW's Biodiversity Offsets Calculator. Various controls for the protection of biodiversity and trees on site would be incorporated into the CEMP and implemented during construction work, including:

- the removal of trees T13, T14, T15, T16. T17, T18, T19, T20, T21, T22 and T25 should be carried out by an experienced tree surgeon in accordance with the NSW WorkCover Code of Practice for the Amenity Tree Industry (1998). Care should be taken to avoid damage to other trees during the felling operation
- trees/vegetation nominated to be removed in the Proposal plans would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through temporary protection measures discussed below
- opportunities for tree retention would be investigated during detailed design, the preference is that trees would be retained
- 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 TfNSW's Vegetation Offset Guideline (2019c) (refer to Biodiversity Assessment Report in *Technical Paper 5*). In accordance with Section 5 of the guideline, it is expected that 40 trees would be required to meet this offset requirement. This should be undertaken in consultation with stakeholders including Sydney Trains and Council.

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures to be incorporated into the CEMP.

6.7. Socio-economic impacts

6.7.1. Existing environment

As discussed in Chapter 4, the Proposal would primarily be located within the existing rail corridor. Land use surrounding the Proposal typically comprises of low density residential properties in bushland characterised area. The closest residences are approximately 20 metres from the proposed work, on Sir Henrys Parade. There are no existing businesses located within the immediate vicinity of the Proposal.

Other community, religious and educational facilities located within the broader area include:

- Sir Henry Parkes Grave (about 25 metres south)
- Faulconbridge Public School (about 1,500 metres north-east)
- Faulconbridge Aikido Aiki Kai (about 105 metres north-east)
- Browett Park (about 120 metres north-east)
- Children's House Montessori (about 275 metres north-east)
- Blue Mountains Podiatry Faulconbridge (about 270 metres north-east).

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

- local residents, particularly on Railway Avenue, Sir Henrys Parade, Clarinda Avenue and Great Western Highway
- customers including train passengers using Faulconbridge station.

A review of the 2016 Australian Bureau of Statistics (ABS) Census data was undertaken for Faulconbridge. The suburb of Faulconbridge has a population of about 4,000 people with a median age of 40 years. Of this population, about 90 per cent were identified as being employed and 7.6 per cent travelled to work via train, which was the second most common mode of travel to work (ABS, 2016).

6.7.2. Potential impacts

a) Construction phase

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

- temporary changes to vehicular, bicycle and pedestrian access to, through and around the station
- temporary closures of Faulconbridge Station to accommodate construction work (as part of pre-scheduled rail 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 an increase in truck movements in the area, delivering site materials, plant and equipment
- construction noise, dust and visual impacts.

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

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

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

b) Operation phase

Overall, the Proposal would provide positive socio-economic benefits to Faulconbridge and the Blue Mountains LGA, including:

- improved access to public transport by providing an accessible route to Faulconbridge Station platforms through the provision of upgraded footpaths and lifts, regraded platform surface and upgraded accessible parking spaces
- improved customer amenity and facilities at the station including a new family accessible toilet and unisex ambulant toilet, adjusted drinking fountain and telephone booth, new TGSIs and wayfinding signage
- improved access to transport interchange facilities through improved paths to meet DSAPT requirements
- increased active transport facilities opportunity through the provision of bike hoops

- potential increased use of public transport to and from Faulconbridge
- additional lighting and CCTV would provide positive CPTED outcomes for the area.

The Proposal has also considered increased patronage in design development to accommodate the forecasted Sydney Trains patronage growth and changing travel patterns.

6.7.3. Mitigation measures

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

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

6.8. Contamination, geology and soils

6.8.1. Existing environment

Landform, geology and soils

The eastern and western side of Faulconbridge Station consists of two different type of topography, geology and soil landscape. The *Soil Landscapes of Central and Eastern NSW – v2* provides the following information on natural topography, geology and associated soil landscape (DPIE, 2019).

The natural topography of the eastern side of Faulconbridge station consists of undulating to rolling low hills with local relief of around 20 to 80 metres and slopes of between 10 to 25 per cent. The eastern side of Faulconbridge Station is underlain by Hawkesbury Sandstone consisting of medium to coarse-grained quartz sandstone with minor shale and laminite lenses. The landscape comprises predominantly shallow to moderately deep soil (30 to 100 centimetres). Limitations associated with the soil landscape include steep slopes, localised rockfall hazard and water erosion hazard.

The natural topography of the western side of Faulconbridge Station consists of level to gently undulating broad crests and ridges on plateau surfaces with local relief of less than 20 metres and slope less than five per cent. The western side of Faulconbridge station is underlain by Hawkesbury Sandstone consisting of medium to coarse-grained quartz sandstone with minor shale and laminite lenses. The landscape comprises predominantly shallow soil (less than 50 centimetres). Limitations associated with soil landscape include shallow, localised non-cohesive soils and localised water erosion hazard.

Acid sulphate soils

A review of the Australian Soil Resource Information System (CSIRO, 2014) identified that there is an extremely low probability of occurrence of acid sulphate soils within 200 metres of the Proposal study area.

Contamination

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

A search of the public register of notices issued by the NSW EPA under *Contaminated Land Management Act 1997* was conducted on 26 August 2019 and found that there are no sites

with notices within 500 metres of the proposal. Therefore, this indicates that there are no regulated sites in the vicinity of Faulconbridge Station.

6.8.2. Potential impacts

a) Construction phase

The Proposal would require excavation work for the installation of foundations and footings for new lift shaft, lift and stairs. Other trenching or excavation may be required for footpath and relocation of services.

Soil disturbance

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

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

Such impacts can be a 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.

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

Contamination

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

The Proposal has the potential to disturb asbestos containing material and other hazardous substances (such as lead paint and PCBs) from the works within the station building. There is also potential for construction activities to result in the contamination of soil through accidental fuel or chemical spills from construction plant and equipment.

Appropriate mitigation measures would be implemented to manage any hazardous substances encountered during demolition work. This would include the removal of hazardous materials by appropriately licensed asbestos/hazardous waste removalists (refer to Section 6.8.3 below).

b) Operation phase

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

6.8.3. Mitigation measures

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures with respect to potential soil and contamination impacts.

6.9. Hydrology and water quality

6.9.1. Existing environment

Surface water

A review of ePlanning portal indicated that the Proposal study area is not located within a flood planning area due to the elevation and topography of the local area. Local creeks surrounding the station include Linden Creek and Numantia Creek from the station.

It is expected runoff from the rail corridor and station area would generally discharge through to local council-maintained infrastructure.

Groundwater

Depth to groundwater within the Proposal study area is unknown. A search of the Australian Groundwater Explorer database on 11 September 2019 indicates that there are no registered groundwater bores within 500 metres of the Proposal. The closest registered ground bore is around 685 metres to the north east of the Proposal.

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 2017* classified as being in good 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.

Faulconbridge station resides within the Grose or Glenbrook drinking water Catchment and Nepean River (Figure 6.24).

Besides the importance of preserving aquatic ecosystems, waterway health, and visual amenity, there are also a variety of uses for water bodies such as Wentworth Falls Lake for recreation and aquatic foods.

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.

There is not expected to be any groundwater impacts during construction as no deep excavations that may encounter the groundwater table are proposed.

The Proposal site is not expected to be subject to wide spread 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 vegetation clearing or excavation have been undertaken. These impacts would be minimised through implementing the mitigation measures outlined in Section 7.2.

As part of the Proposal study area lies within an identified drinking water catchments, WaterNSW requires that any impacts from the Project 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.

Overall, the minor nature and extent of construction at the Proposal, these impacts are considered unlikely to significantly impact water quality.

Figure 6.24 Location of major catchment areas within the Blue Mountains Local Government Area

Source: Blue Mountains Waterways Health Report 2017

b) Operation phase

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

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

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

6.9.3. Mitigation measures

As noted in Section 6.8.3, a site-specific Erosion and Sediment Control Plan would be prepared and implemented for the Proposal to manage risks to water quality. Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures with respect to water quality and hydrology.

6.10. Air quality

6.10.1. Existing environment

Regional air quality

The Sydney north-west monitoring region provides the most representative air quality monitoring results for the Proposal. The Sydney north-west monitoring region includes air quality monitoring sites at Parramatta North, Richmond, St Marys, Prospect and Rouse Hill.

Air quality results obtained from the closest St Marys monitoring station (approximately 23 km from the Proposal) indicate that the 2018 annual average concentrations of particulate matter ($PM_{2.5}$) at St Marys monitoring station is around 7.8 µg/m^3 (micrograms per cubic meter)

The sensor at Faulconbridge from the Blue Mountains and Lithgow Air Watch Project also provides indicative measurement of pollutants in real time. On 13 September 2019 11:00AM, the sensors indicate the concentrations of particulate matter ($PM_{2.5}$) is around 9 µg/m^3 (micrograms per cubic meter). Hence, the concentration of $PM_{2.5}$ at the Proposal area is likely to be below 10 µg/m^3 (micrograms per cubic meter).

Air pollutant sources

Based on the land uses surrounding Faulconbridge Station, the existing air quality is likely to be characteristic of a suburban environment. A search of the National Pollutant Inventory undertaken on 27 August 2019 identified no registered facilities within the Blue Mountains LGA. The search identified 73 air polluting substances from three sources in the Blue Mountains LGA.

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

Sensitive receivers

Sensitive receivers in the vicinity of the Proposal include:

- local residents, particularly on Railway Avenue, Sir Henrys Parade, Clarinda Avenue, Great Western Highway
- customers including train passengers using Faulconbridge Station.

6.10.2. Potential impacts

a) Construction phase

The main air quality impacts that have the potential to occur during construction would be temporary impacts associated with dust particles and emissions of carbon monoxide, sulphur dioxide, particulate matter (PM_{10}), particulate matter ($PM_{2.5}$) nitrous oxides, volatile organic compounds, and polycyclic aromatic hydrocarbons associated with the combustion of diesel fuel and petrol from construction plant and equipment.

Anticipated sources of dust and dust-generating activities include:

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

The Proposal would be likely to have a minimal 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 lead to increases in exhaust emissions in the local area however these impacts would be minor and short-term.

b) Operation phase

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

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

6.10.3. Mitigation measures

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures with respect to potential air quality impacts.

6.11. Waste and resources

6.11.1. Potential impacts

a) Construction phase

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

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

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

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

Waste management targets in consideration of the Infrastructure Sustainability Rating Scheme – Version 1.2 (ISCA, 2018) would be developed for the Proposal. The above waste management targets would also include reuse and recycling and be included in the sustainability management plan.

b) Operation phase

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

6.11.2. Mitigation measures

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures with respect to potential waste impacts.

6.12. Hazard and risk

6.12.1. Existing environment

The existing environment of the Proposal consists of predominantly rail infrastructure and public recreation land on the western side of Faulconbridge station. Land use surrounding Faulconbridge station is mainly low density residential properties situated in bushland characterised area. Bushfire prone land classified as vegetation Category 1 (high combustibility and likelihood of forming fully developed fires) are present within 100 metres of the Proposal, indicating a risk of bushfire.

There are potential risks in the existing environment including:

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

6.12.2. Potential impacts

a) Construction phase

Risks associated with the construction of the proposal would include:

- occupational work health and safety issues associated with the workforce undertaking the construction and the construction methods used
- environmental impacts from the transport, storage and use of fuels, chemicals and other dangerous goods required for the construction work
- environmental impacts from the generation, storage, treatment and/or disposal of proposal-related wastes, including hazardous wastes (e.g. asbestos and PCBs) and sanitary waste from temporary construction facilities
- bushfire risk resulting from:
    - construction activities that are not conducted in accordance with standard work procedures including inappropriate storage of flammable chemicals from potential ignition source
    - electrical fault from equipment used during construction if powered device are not maintained.

b) Operation phase

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

6.12.3. Mitigation measures

Refer to Table 7.1 in Section 7.2 for a full list of proposed mitigation measures with respect to potential hazards and risk.

6.13. Sustainability

The design of the Proposal would be based on the principles of sustainability, including aiming for an excellent rating as a program under the Infrastructure Sustainability Council of Australia's (ISCA) Infrastructure Sustainability (IS) Rating Tool Version 1.2 and the TfNSW 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.

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

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

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

6.14. Climate change

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

Overall, the climate change impacts are considered moderate at Faulconbridge Station. Consideration of the potential impacts of climate change on the Proposal identified the following impacts that would require further design considerations:

- increased frequency of heatwave conditions which can lead to heat stress of passengers and reduced capacity of staff
- increases in mean temperature and number of hot days that could result in the potential failure of lighting, CCTV, PA systems and other electrical components
- increased rainfall which may result in customers waiting outside during rainfall events due to the limited sheltered space
- vulnerability to bushfire risk as described in Section 6.12.

Following are mitigation options that would be considered in the next design stage:

- lift design would consider future temperature increases including insulation/glazing, cooling, and protections on electrical equipment
- ensure sufficient protections of electrical systems (such as for lifts) are in place to meet expectations of future temperature increases
- consider the installation of canopies along the accessible pathway such as between the car park and platforms and/or or along the existing stairs and along platforms to shelter commuters from extreme heat and rainfall events
- avoid use of metal outdoor furniture.

6.15. Greenhouse gas emissions

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

Projects are required to establish a baseline footprint using the *Carbon Estimate and Reporting Tool (CERT)* and demonstrate a reduction of construction related greenhouse gas emissions of at least five per cent from the established project baseline *(Note: The project baseline is automatically generated within the CERT tool, refer to CERT user manual (*2019k *for details).*

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

6.16. Cumulative impacts

6.16.1. Existing or potential projects

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

A search of the DPIE's Major Projects Register, Sydney Western City Planning Panel Development and Planning Register, and Blue Mountains City Council Development Application Register in August 2019 identified that no major development applications were listed in Faulconbridge for approval. However, the following current and proposed projects might affect the rail possession periods and have the potential to contribute to cumulative impacts from the Proposal:

- New Intercity Fleet Springwood to Lithgow Rail Corridor Modifications
- Power Supply Upgrade (PSU) Program - feeder and overhead wiring (OHW) upgrades on the Blue Mountains line
- Glenbrook Station Upgrade

- Lapstone Station Upgrade.

New Intercity Fleet Springwood to Lithgow Rail Corridor Modifications

The New intercity Fleet Springwood to Lithgow Rail Corridor Modifications is a project to modify the existing rail corridor from west of Springwood Station to Lithgow Station. This project includes minor modifications to the Ten Tunnels Deviation to accommodate the new and existing trains and enable the new trains to service customers all the way to Lithgow. Construction of the project commenced in February 2019.

Feeder and overhead wiring (OHW) upgrades on the Blue Mountains line

The feeder and overhead wiring upgrades on the Blue Mountains Line is delivered as part of the Power Supply Upgrade Program. This project aims to upgrade the electrical infrastructure including the overhead across the network to meet the expected power requirements for Sydney future rail network and new fleet of air conditioned trains.

Glenbrook Station Upgrade

The Glenbrook Station Upgrade is delivered as part of the Transport Access Program. This project aims to improve the station accessibility at Glenbrook Station. This project includes constructions of different facilities including a new lift, a new accessible kiss and ride area. This project is expected to complete in early 2020.

Lapstone Station Upgrade

The Lapstone Station Upgrade is delivered as part of the Transport Access Program. This project aims to improve the station accessibility at Lapstone Station. This project is expected to commence in mid-2020 and be completed by end of 2021

6.16.2. Potential impacts

The hi rail access point on north-east of the Proposal locates near the intersection with Sir Henrys Parade and Great Western Highway and is the main access point for hi rail equipment on the Blue Mountains Line. As these other projects are likely to utilise this hi rail access point to move equipment during the rail possession weekends, there could potentially be delays on the road and at the intersection. Similarly, the feeder and OHW upgrades on the Blue Mountains line may have some construction impacts in terms of moving equipment up the line past Lapstone Station during rail possession period. If power supply upgrades are required at the station, works would be done separately to TAP.

6.16.3. Mitigation measures

Based on this assessment, it is anticipated that any cumulative impacts associated with the Proposal would be minor, with the implementation of the mitigation measures identified in Chapter 7.

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.

7.1. Environmental management plans

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

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

7.2. Mitigation measures

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

Table 7.1 Proposed mitigation measures

No.	Mitigation measure	Stage
	General	
1	A Construction Environmental Management Plan (CEMP) would be prepared by the Construction Contractor in accordance with the relevant requirements of *Guideline for Preparation of Environmental Management Plans,* Department of Infrastructure, Planning and Natural Resources, 2004) for approval by TfNSW, prior to the commencement of construction and following any revisions made throughout construction.	Pre-construction
2	A project risk assessment including environmental aspects and impacts would be undertaken by the Construction Contractor prior to the commencement of construction and documented as part of the CEMP.	Pre-construction
3	An Environmental Controls Map (ECM) would be developed by the Construction Contractor in accordance with TfNSW's *Guide to Environmental Controls Map* (TfNSW, 2019l) for approval by TfNSW, prior to the commencement of construction and following any revisions made throughout construction.	Pre-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.	Pre-construction
5	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.	Construction
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.	Construction
7	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by TfNSW. This assessment would need to demonstrate the Proposal, as modified, is not likely to significantly affect the environment.	All stages

No.	Mitigation measure	Stage
	Traffic and transport	
8	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: • 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 • ensuring adequate regulatory road signage, line marking and all other traffic control devices necessary to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised. • ensuring access to the railway station is always maintained outside of the scheduled rail possession periods • 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 • consultation with the relevant roads authorities would be undertaken during preparation of the CTMP. The performance of all project traffic arrangements must be monitored during construction. • maximising safety and accessibility for pedestrians and cyclists • ensuring adequate sight lines to allow for safe entry and exit from the site • ensuring access to railway stations, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made) • details for rail replacement bus stops if required, including appropriate signage to direct patrons, in consultation with the relevant bus operators. Particular provisions would also be considered for the accessibility impaired • measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the CTMP.	Pre-construction
9	Communication would be provided to the community and residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site works.	Construction
10	Road Occupancy Licences for temporary road closures would be obtained, where required	Pre-construction/ Construction
11	Suitable vehicle, pedestrian and cyclist paths would be maintained throughout the construction of the proposed upgrade to ensure safe and easy access throughout the interchange outside of the scheduled rail possession periods	Construction
12	Suitable pedestrian provisions would be made to ensure that pedestrian connectivity between bus stops is not impacted as a part of the works and that suitable and safe paths are provided	Construction

No.	Mitigation measure	Stage
13	Qualified traffic controllers would be used during construction works to ensure safe and efficient movement of vehicle and pedestrian traffic on the external road as well as in and out of the construction site.	Construction
14	Fencing and barriers would be installed between construction site and outside construction zone to ensure safe and easy navigation of pedestrians and cyclists.	Construction
	Landscape and visual amenity	
15	An Urban and Landscape Design Plan (ULDP) would be prepared by the Contractor, in consultation with Blue Mountains City Council, and submitted to TfNSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The ULDP, at a minimum, would address the following: • the appropriateness of the proposed design with respect to the existing surrounding landscape, built form, behaviours and use-patterns (including consideration of Crime Prevention Through Environmental Design principles). This is to include but not be limited to site analysis, vision and objectives for the infrastructure, strategies that apply to ISCA approved guidelines in accordance with Urb-1 (ISCA version 1.2) • connectivity with surrounding local and regional movement networks including street networks, other transport modes and active transport networks. Existing and proposed paths of travel for pedestrians and bicycles should be shown • integration with surrounding local and regional open space and or landscape networks. Existing and proposed open space infrastructure/landscape elements should be shown • integration with surrounding streetscape including street trees, entries, vehicle cross overs etc • integration with surrounding built form (existing or desired future) including building height, scale, bulk, massing and land-use • design detail that is sensitive to the amenity and character of heritage items located within or adjacent to the Proposal site.	Pre-construction
16	A Public Domain Plan (PDP) would be prepared by the Contractor, in consultation with Blue Mountains City Council, and submitted to TfNSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The PDP, as a minimum, would address the following: • materials, finishes, colour schemes and maintenance procedures including graffiti control for new walls, barriers and fences • location and design of pedestrian and bicycle pathways, street furniture including relocated bus and taxi facilities, bicycle storage (where relevant), telephones and lighting equipment.	Pre-construction
17	Opportunities for public art created by local artists to be incorporated, where considered appropriate, into the Proposal	Pre-construction
18	All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to AS 1158 Road Lighting and AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting the detailed design of the Proposal	Pre-construction/ Construction
19	Proposal would comply with Crime Prevention Through Environmental Design principles worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations	Pre-construction/ Construction

No.	Mitigation measure	Stage
20	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.	Construction
21	During construction, graffiti would be removed in accordance with TfNSW's Standard Requirements	Construction
22	In addition, the following mitigation measures should be considered, during construction: • temporary access arrangements should be well signed and provide a visually legible route for pedestrians • consolidate site equipment and facilities to maximise the area of useable public realm and maintain pedestrian permeability.	Construction
23	Requirements identification of design and landscaping aspects that will be open for stakeholder input, as required	Pre-construction
24	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.	Construction
	Noise and vibration	
25	Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (TfNSW, 2019a) and the Noise and Vibration Impact Assessment for the Proposal. The CNVMP will take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.	Pre-construction
26	The CNVMP shall outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include: • avoiding any unnecessary noise when carrying out manual operations and when operating plant • avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable • ensuring spoil is placed and not dropped into awaiting trucks • switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded • 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 • maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances • using the most suitable equipment necessary for the construction works at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours works	Pre-construction

No.	Mitigation measure	Stage
	– also set up the site where possible to minimise reversing (e.g. forward in, forward out movements) • use of quieter and less vibration emitting construction methods where feasible and reasonable • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours works.	
27	Works would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any works outside these hours may be undertaken if approved by TfNSW and the community is notified prior to these works commencing. An Out of Hours Work application form would need to be prepared by the Construction Contractor and submitted to the TfNSW Environment and Planning Manager for any works outside standard hours.	Construction
28	As per the *Construction Noise and Vibration Strategy* (TfNSW, 2019a), construction activities with special audible characteristics (high noise impact, intensive vibration, impulsive or tonal noise emissions) would be limited to standard hours, starting no earlier than 8am; and to continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block, unless otherwise approved by TfNSW.	Construction
29	Blasting, where required, would be limited to between 9am and 5pm Monday to Friday and 9am and 1pm Saturday. There would be no blasting on Sundays or public holidays.	Construction
30	Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.	Construction
31	Vibration resulting from construction and received at any structure outside of the Proposal area would be managed in accordance with: • for structural damage vibration - German Standard DIN 4150: Part 3 – 1999 *Structural Vibration in Buildings: Effects on Structures* and British Standard BS 7385-2:1993 *Guide to Evaluation of Human Exposure to Vibration in Buildings* (1 Hz to 80 Hz) • for human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS 7385-2:1993 *Guide to Evaluation of Human Exposure to Vibration in Buildings* (1 Hz to 80 Hz).	Construction
32	Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory works including jack hammering and compaction for all buildings/structures/roads with a plan distance of 20 metres from the works and all heritage listed buildings and other sensitive structures within 50 metres of the works (unless otherwise determined following additional assessment they are not likely to be adversely affected).	Pre-construction
33	Affected pre-schools, schools, universities and other identified sensitive receivers are to be consulted in relation to noise mitigation measures to identify any noise sensitive periods, e.g. exam periods. As much as reasonably possible noise intensive construction works in the vicinity of affected educational buildings are to be minimised.	Pre-construction

No.	Mitigation measure	Stage
	Aboriginal heritage	
34	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.	Pre-construction
35	If unforeseen unidentified Aboriginal objects are uncovered during construction, the procedures contained in the TfNSW *Unexpected Heritage Finds Guideline* (TfNSW, 2019b) would be followed, and work within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Department of Premier and Cabinet (formerly the Heritage Division of OEH now Environment, Energy and Science (EES)) and the Local Aboriginal Land Council.	Construction
36	If human remains are found, work would cease, the site secured and the NSW Police and the Department of Premier and Cabinet (formerly the Heritage Division of OEH) notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to work recommencing at the location.	Construction
	Non-aboriginal heritage	
37	A suitably qualified and experienced heritage conservation architect would be engaged to provide ongoing heritage and conservation advice throughout detailed design and any subsequent relevant design modifications. The nominated heritage conservation architect would provide specialist advice throughout the detailed design phase to ensure that the final design adheres to the following strategies and design recommendations made in the SoHI (Artefact, 2019)	Pre-construction
38	In accordance with Section 170a of the Heritage Act, Sydney Trains should provide notification of the works to Heritage Division 14 days prior to the commencement of the works.	Pre-construction
39	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in TfNSW's Unexpected Heritage Finds Guideline (TfNSW, 2019b) would be followed, and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the TfNSW Project Manager and the TfNSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and Department of Premier and Cabinet (formerly the Heritage Division of OEH). Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.	Construction
	Biodiversity	
40	Construction of the Proposal must be undertaken in accordance with TfNSW's *Vegetation Management (Protection and Removal) Guideline* (TfNSW, 2019d) and TfNSW's *Fauna Management Guideline* (TfNSW, 2019e).	Pre-construction /Construction

No.	Mitigation measure	Stage
41	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.	Pre-construction
42	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees/vegetation nominated to be removed in the Arboricultural Impact Assessment Report (Earthscape Horticultural Services, August 2019) 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.	Pre-construction
43	A tree protection plan and tree protection measures has been prepared for the Proposal (refer to the Arboricultural Impact Assessment report by Earthscape, 2019 in *Technical Paper 6*). Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Arboricultural Impact Assessment report by (Earthscape, 2019). Tree protection would be undertaken in line with AS 4970-2009 Protection of Trees on Development Sites and would include exclusion fencing of TPZs	Pre-construction
44	In the event of any tree to be retained becoming damaged during construction, the Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.	Construction
45	Should the detailed design or onsite works determine the need to remove or trim any additional trees, which have not been identified in the REF, the Construction Contractor would be required to complete TfNSW's Tree Removal Application Form and submit it to TfNSW for approval.	Construction
46	For new landscaping works, mulching and watering would be undertaken until plants are established	Construction
47	Weed control measures, consistent with TfNSW's Weed Management and Disposal Guideline (TfNSW, 2019f), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the Proposal. This would include the management and disposal of weeds in accordance with the Noxious Weeds Act 1993 and Biosecurity Act 2015.	Construction
	Socio-economic	
48	Sustainability criteria for the Proposal would be established to encourage the Construction Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.	Pre-construction
49	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.	Pre-construction
50	A Community Liaison Management Plan would be prepared prior to construction to identify all potential stakeholders and best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where practicable.	Pre-construction
51	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.	Pre-construction

No.	Mitigation measure	Stage
52	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Management Plan to be developed prior to construction.	Pre-construction
	Soils and water	
53	Prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the *'Blue Book' Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction.	Pre-construction
54	Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the works are complete and areas are stabilised.	Pre-construction
55	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.	Construction
56	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and TfNSW's *Chemical Storage and Spill Response Guidelines* (TfNSW, 2019g).	Construction
57	Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the TfNSW *Chemical Storage and Spill Response Guidelines* (TfNSW, 2019g) 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.	Construction
58	In the event of a pollution incident, works would cease in the immediate vicinity and the Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager. The EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the POEO Act.	Construction
59	The existing drainage systems would remain operational throughout the construction phase.	Construction
60	Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and TfNSW's *Water Discharge and Reuse Guideline* (TfNSW, 2019h).	Construction
	Air quality	
61	Air quality management and monitoring for the Proposal would be undertaken in accordance with TfNSW's *Air Quality Management Guideline* (TfNSW, 2019i).	Construction
62	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.	Pre-construction
63	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.	Construction

No.	Mitigation measure	Stage
64	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.	Construction
65	To minimise the generation of dust from construction activities, the following measures would be implemented: • apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) • cover stockpiles when not in use • appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading • prevent mud and dirt being tracked onto sealed road surfaces.	Construction
	Waste and contamination	
66	The CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum: • identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data.	Pre-construction
67	An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with SafeWork NSW requirements.	Pre-construction
68	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.	Pre-construction / Construction
69	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal.	Construction
70	Any concrete washout would be established and maintained in accordance with TfNSW's *Concrete Washout Guideline* – (TfNSW, 2019j) with details included in the CEMP and location marked on the ECM.	Construction
	Hazard and risk	
71	A construction safety management plan should be prepared prior to commencement of construction	Pre-construction
72	Work should be carried out in compliance with statutory requirements, industry standards throughout the construction of the Proposal	Construction
73	Dangerous goods wastes (if any) and all hazardous wastes (if found) will be managed in accordance with the Proposal CEMP (or separate Waste Management Plan, if necessary)	Construction
74	Storage of any potentially dangerous goods on site would be undertaken in accordance with standards and statutory requirements	Construction

No.	Mitigation measure	Stage
75	Goods used on site would be in accordance with manufacturers' instruction, good practice etc	Construction
76	Any hazardous wastes (if any) would be disposed of by a licensed contractor to approved facilities	Construction
77	Electrical equipment and other plant and machinery would be maintained in operational order that is fit for purpose and to prevent potential sparks	Construction
78	A site induction for contractors working on the Project would include general bushfire protection measures and requirements	Pre-construction
79	All legislative requirements regarding safe work procedures would be met, including chemical handling and storage	Pre-construction / construction
80	Prior to work commencing on any existing building or structures, a hazardous materials survey for lead paint, asbestos and other potentially hazardous materials would be required	Pre-construction
	Sustainability, climate change and greenhouse gases	
81	Detailed design of the Proposal would target a rating of 'Excellent' using the ISCA Infrastructure Sustainability Rating Scheme (v1.2)	Pre-construction
82	The detailed design process would undertake an AS 14064-2 (Greenhouse Gases – project level) compliant carbon footprinting exercise in accordance with TfNSW's *Carbon Estimate and Reporting Tool Manual* (TfNSW, 2019k). The carbon footprint would to be used to inform decision making in design and construction.	Pre-construction

8. Conclusion

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

The Proposal would provide the following benefits:

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

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

- moderate adverse visual impacts from views north and south of the station platform due to works from the lift, stairs and construction activities
- noise impacts assessed have all construction activities reaching noise exceedances; however, activities 1, 3, 4 and 6 are to occur during standard hours with no impact to sleep disturbance
- temporary disruptions to station facilities and amenities during construction
- minor direct and indirect (visual) heritage impacts on heritage fabric of the existing station building from the introduction of new elements, such as the lifts
- temporary changes to vehicular, bus, bicycle and pedestrian access to, through and movements around the station during construction
- removal of 11 trees ranging from very low to moderate retention values to accommodate construction works related to lift installation and footpath grading
- potential sediment mobilisation, dust generation, erosion risk and hazards risk during construction.

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

The Proposal has also taken into account the principles of ESD and sustainability (refer to Section 4.3 and Section 6.13). These would be considered further during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

References

- ABS 2016, census data (https://quickstats.censusdata.abs.gov.au/census_services/getproduct/census/2016/quickstat/SSC11496?opendocument).
- Blue Mountains City Council's Waterways Health Report 2017.
- Blue Mountains City Council, 2017, Disability Inclusion Action Plan 2017 – 2021.
- Bowles, A.E. (1997) Responses of wildlife to noise. in R. L. Knight and K. Gutzwiller, editors. Wildlife and recreationists: coexistence through Management and Research, Island Press, Washington D.C., USA.
- Bureau of Meteorology, 2019, 'Australian Groundwater Explorer' accessed 11 September 2019, http://www.bom.gov.au/water/groundwater/explorer/.
- CSIRO, 2014, Australian Soil Resource Information System (ASRIS), Commonwealth Scientific and Industrial Research Organisation (CSIRO), Commonwealth of Australia, viewed on 10 September 2019, accessed at http://www.asris.csiro.au/mapping/viewer.htm.
- Department of the Environment and Energy, 2019, 'National Pollutant Inventory' accessed 27 August 2019, http://www.npi.gov.au/npi-data/search-npi-data.
- DECC, 2009, Interim Construction Noise Guideline.
- Department of Environment and Conservation, 2006, Assessing Vibration: A Technical Guideline, Sydney.
- Department of Infrastructure, Planning and Natural Resources, 2004, Guideline for Preparation of Environmental Management Plans, Sydney.
- Department of Planning, Industry and Environment, 2019, Soil Landscapes of Central and Eastern NSW - v2, NSW Office of Environment and Heritage, Sydney.
- EPA, 2011, Road Noise Policy (RNP).
- Forman, R. T. T., et al. (2000). Road Ecology. Science and Solutions. Washington, Island Press.
- EPA, 2017, Noise Policy for Industry, Sydney.
- EPA, 2019, List of NSW contaminated Sites Notified to the EPA, as of 26 August 2019.
- EPA, 2014, Waste Classification Guidelines Part 1: Classifying waste, Sydney.
- Forman, R. T. T., et al. (2000). Road Ecology. Science and Solutions. Washington, Island Press.
- Greater Sydney Commission, 2018. A Metropolis of Three Cities – Greater Sydney Region Plan. NSW Government, Sydney.
- Greater Sydney Commission, 2018a, Western District Plan, Sydney.
- ISCA, 2018, Infrastructure Sustainability Rating Scheme - Version 1.2.
- Landcom, 2004, Managing Urban Stormwater: Soils and Construction Guidelines, Volume - 4th Edition, Sydney.

- Ministry of Transport, 2008, Guidelines for the Development of Public Transport Interchange Facilities.
- NSW Department of Environment and Climate Change, 2009 Interim Construction Noise Guideline (ICNG).
- NSW Heritage Office, 1998, How to Prepare Archival Records of Heritage Item, Sydney.
- NSW Government, 2015, NSW Making it Happen, Sydney.
- NSW Government, 2018, NSW State Infrastructure Strategy 2018-2038.
- NSW Heritage Office, 2006, Photographic Recording of Heritage Items Using Film or Digital Capture, Sydney.
- Office of Environment & Heritage, 2019. "BioNet Vegetation Classification 2.1." 2018, from http://www.environment.nsw.gov.au/research/Visclassification.htm.
- Schwartz, A. and R. W. Henderson (1991). Amphibians and Reptiles of the West Indies: descriptions, distributions, and natural history. Gainesville, University of Florida Press.
- Sydney Trains, 2017. Sydney Trains Heritage Technical Note, Installation of New Electrical and Data Services at Heritage Sites.
- TfNSW, 2013, Sydney's Walking Future Connecting people and places, Sydney.
- TfNSW, 2017a, Disability Inclusion Action Plan 2018-2022, Sydney.
- TfNSW, 2017b, NSW Sustainable Design Guidelines – Version 4.0.
- TfNSW, 2018, Future Transport Strategy 2056, TfNSW, Sydney.
- TfNSW, 2019a, Construction Noise and Vibration Strategy (CNVS), Sydney.
- TfNSW, 2019b, Unexpected Heritage Finds Guideline, Sydney.
- TfNSW, 2019c, Vegetation Offset Guideline (2019), Sydney.
- TfNSW, 2019d, Vegetation Management (Protection and Removal) Guideline, Sydney.
- TfNSW, 2019e, Fauna Management Guideline, Sydney.
- TfNSW, 2019f, Weed Management and Disposal Guideline, Sydney.
- TfNSW, 2019g, Chemical Storage and Spill Response Guidelines, Sydney.
- TfNSW, 2019h, Water Discharge and Reuse Guideline, Sydney.
- TfNSW, 2019i, Air Quality Management Guideline, Sydney.
- TfNSW, 2019j, Concrete Washout Guideline, Sydney.
- TfNSW, 2019k, Carbon Estimate and Reporting Tool Manual, Sydney.
- TfNSW, 2019l, Guide to Environmental Controls Map, Sydney.

Appendix A Consideration of matters of National Environmental Significance

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

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

Appendix B Consideration of clause 228

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

Factor	Impacts
(a) Any environmental impact on a community? There would be some temporary impacts to the community during construction, particularly in relation to noise, traffic and access and visual amenity. Mitigation measures outlined in Table 7.1 would be implemented to manage and minimise adverse impacts.	Minor
(b) Any transformation of a locality? The Proposal would involve the introduction of new visible elements in the landscape (two new lifts, canopy and minor adjustments/relocation of existing infrastructures). The appearance of the new elements would be consistent with the existing station elements. The Proposal would have a positive contribution to the locality by creating accessible entrances to the station and station platforms.	Minor
(c) Any environmental impact on the ecosystem of the locality? The Proposal would require minor vegetation removal. However, given the Proposal's location within an urbanised environment and the low habitat value of the trees to be removed, impacts to biodiversity and ecosystems are expected to be minor.	Minor
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? There would be some temporary impacts during construction particularly in relation to noise, traffic and access and visual amenity. The Proposal would not result in any substantial reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.	Minor
(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? Faulconbridge Railway Station is listed on the NSW Transport RailCorp s170 Heritage and Conservation Register. The Proposal would retain the overall heritage value of the existing station.	Minor
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The Proposal is unlikely to have any impact on the habitat of protected fauna.	Nil
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The Proposal is unlikely endanger any species of animal, plant or other form of life, whether living on land, in water or in the air.	Nil
(h) Any long-term effects on the environment? The Proposal is unlikely to have any long-term effects on the environment.	Nil
(i) Any degradation of the quality of the environment? The Proposal is unlikely to have any degradation on the quality of the environment.	Nil
(j) Any risk to the safety of the environment? The Proposal is unlikely to cause any pollution or safety risks to the environment provided the recommended mitigation measures are implemented.	Nil

Factor	Impacts
(k) Any reduction in the range of beneficial uses of the environment? The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.	Nil
(l) Any pollution of the environment? The Proposal is unlikely to cause any pollution or to the environment provided the recommended mitigation measures are implemented	Nil
(m) Any environmental problems associated with the disposal of waste? Hazardous wastes are present on site. However, it is unlikely to cause any environmental problems associated with the disposal of waste. All waste would be managed and disposed of with a site-specific Waste Management Plan. Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable..	Minor
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Proposal is to unlikely increase demands on resources that are, or are likely to become, in short supply.	Nil
(o) Any cumulative environmental effect with other existing or likely future activities? Cumulative effects of the Proposal are described in Section 6.16. Where feasible, environmental management measures would be co-ordinated to reduce any cumulative construction impacts. The Proposal is unlikely to have any significant adverse long-term impacts..	Nil
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The Proposal would not affect or be affected by any coastal processes or hazards.	Nil

Appendix C Neutral or beneficial effect assessment

NorBE assessment – will there be a neutral of beneficial effect on water quality? (Assessment must consider surface and ground waters and must consider construction & operational stages.)

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?**

   Potential pollutants during construction include sediments from excavation and ground disturbance, chemicals, materials and fuels from plant and equipment. Construction activities may also directly impact the underground stormwater network and surface water runoff. There is presence of hazardous substances on site, however, it is not expected to have a negative impact on the water quality with the implementation of the appropriate mitigation measures in section 7.2. Existing drainage points would be protected during construction to minimise the potential for damage. There would not be significant difference from current operation and hence would not generate any further pollutants, sediments or contaminants that could impact on water quality.

2. **For each pollutant list the safeguards needed to prevent or mitigate potential impacts on water quality (these may be Water NSW endorsed current recommended practices and/or equally effective other practices)?**

   Sediments and potential contaminants generated during excavation and construction would be managed through the following:

   - prior to commencement of work, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the ‘Blue Book’ Managing Urban Stormwater: Soils and Construction (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
   - stockpiles would be appropriately maintained, covered and contained which could include covering or regular watering to minimise dust
   - traffic movements on any disturbed areas would be limited
   - wash down areas would be appropriately constructed, and the collected material disposed of off-site
   - disturbed surfaces would be stabilised as soon as possible
   - wash down of concrete mixers, concreting equipment and trucks would take place in an appropriate area away from drainage lines and stormwater drains
   - if groundwater is encountered during excavation works, it would be managed in
   - accordance with the requirements of the Waste Classification Guidelines (EPA, 2014) and Water Discharge and Reuse Guideline (TfNSW, 2019h)
   - dangerous goods wastes (if any) and all hazardous wastes (if found) would be managed in accordance with the Proposal CEMP (or separate Waste Management Plan, if necessary)
   - storage of any potentially dangerous goods on site would be undertaken in accordance with standards and statutory requirements

- any hazardous wastes (if any) would be disposed of by a licensed contractor to approved facilities.

For a more in-depth explanation around potential impacts to water quality and for further mitigation measures in relation to soils and water, refer to sections 6.8, 6.9 and 7.2 in the REF.

Chemicals and fuels from plant and equipment used during construction:

- refuelling of vehicles or machinery is to occur within a containment or hardstand area designed to prevent the escape of spilled substances to the surrounding environment
- plant and equipment used during the works would be properly maintained and routinely inspected to minimise the risk of fuel or oil leaks
- spill kits containing spill response materials suited to the appropriate to products used on site must be readily available
- all required chemicals and fuels must be located within a bunded enclosure located away from drainage lines and stormwater drains
- plant and equipment must be regularly inspected to check for oil leaks.

3. Will the safeguards be adequate for the time required? How will they need to be maintained?

Given the short length of construction and the minor nature of the works, the safeguards proposed are considered to be adequate. The points of drainage for the sites can be adequately protected with the implementation of standard mitigation measures. Mitigation measures will be implemented and maintained and inspected through a CEMP prepared for the works.

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?

All impacts on water quality would be effectively contained on the site provided that the mitigation measures are implemented effectively. There are only man-made drainages on sites and no natural waterbodies nearby. The implementation of standard erosion and sediment controls would be sufficient to protect the drainage points on site. Implementation of the described mitigation measures would prevent any potential spills or leaks reaching any drainage points or watercourses.

5. Is it likely that a neutral or beneficial effect on water quality will occur? Why?

The implementation of the described safeguards would be adequate to prevent contamination of waterways during construction. The Proposal would not result in major differences from current operations. Hence it is considered that the Proposal is likely to have a neutral effect on water quality.