

Transport Access Program

Banksia Station Upgrade

Review of Environmental Factors





Banksia Station Upgrade – Review of Environmental Factors

Transport Access Program Ref-6449148

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Abbreviations

Term	Meaning
AS	Australian Standard
BS	British Standard
ссту	Closed Circuit Television
CEMP	Construction Environmental Management Plan
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)
ESD	Ecologically Sustainable Development (refer to Definitions)
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)
IS rating	Infrastructure Sustainability rating under ISCA rating tool (v 1.2)
ISCA	Infrastructure Sustainability Council of Australia
LGA	Local Government Area
NES	National Environmental Significance (refers to matters of National Environmental Significance under the EPBC Act)
NPfl	Noise Policy for Industry (EPA, 2017)
NSW	New South Wales
RailCorp	(former) Rail Corporation of NSW
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Rockdale LEP 2011	Rockdale Local Environmental Plan 2011
SEPP	State Environmental Planning Policy
TGSI	Tactile Ground Surface Indicators

Definitions

Term	Meaning
'A' frequency rating	Frequency weightings are used to adjust sound level meters so that they are measuring and reporting noise levels that represent what humans hear. The human ear is more sensitive to midrange frequencies between 500 Hz and 6 kHz (for example a child's scream) and less sensitive to very low or very high pitch noises. Sound level meters have inbuilt frequency weighting networks that very roughly approximate the human loudness response at low sound levels. It should be noted that the human loudness response is not the same as the human annoyance response to sound. Here low frequency sounds can be more annoying than midrange frequency sounds even at very low loudness levels. The 'A' weighting is the most commonly used frequency weighting for occupational and environmental noise assessments.
Asset Standards Authority	The ASA is an independent body within Transport for NSW, responsible for engineering governance, assurance of design safety, and ensuring the integrity of transport and infrastructure assets.
Average Recurrence Interval	The likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100-years.
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the Construction Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
dBA	See 'A' frequency rating.
Decibel (dB)	The decibel (dB) is a unit used to measure the intensity of a sound by comparing it to a given value on a logarithmic scale. The logarithmic scale allows a wide range of values to be compressed into a more comprehensible range, typically 0–120 dB.
Construction Contractor	The entity appointed by Transport for NSW to undertake the construction of the Proposal. The Construction Contractor is responsible for all work on the project, both design and construction.
Detailed design	Detailed design broadly refers to the process that the Construction Contractor undertakes (should the Proposal proceed) to refine the concept design to a design suitable for construction (subject to Transport for NSW acceptance).
Determining Authority	A Minister or public authority on whose behalf an activity is to be carried out or public authority whose approval is required to carry out an activity (under Division 5.1 of the EP&A Act).
Disability Standards for Accessible Public Transport 2002	The Commonwealth <i>Disability Standards for Accessible Public Transport 2002</i> (as amended) are a set of legally enforceable standards, authorised under the Commonwealth <i>Disability Discrimination Act 1992</i> for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Ecologically Sustainable Development	As defined by clause 7(4) Schedule 2 of the EP&A Regulation. Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.

Term	Meaning
Feasible	A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.
Interchange	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.
Noise management level	A noise management level is a criteria for managing noise levels associated with an activity. They are site/project specific and are calculated based on the level of ambient noise (represented by the rating background level (RBL)) already at the site. A noise management level will consist of the RBL plus an allowable increase in noise emissions (e.g. RBL + 10 dB). If noise emissions increase above the NML, sensitive receivers are likely to be disturbed. There are usually two types of noise management level, 'noise affected' and 'highly noise affected'. The noise affected level represents the point above which there may be some community reaction to noise. The highly noise affected level represents the point above which there may be strong community reaction to noise.
Noise sensitive receiver	In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (e.g. schools, TAFE colleges), health care facilities (e.g. nursing homes, hospitals), recording studios and places of worship/religious facilities (e.g. churches).
Out of hours work	Defined as work carried out <i>outside</i> standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act.
Rail possession	Rail possession is the term used by railway building/maintenance personnel to indicate that they have taken possession of the track (usually a section of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Reasonable	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
Sydney Trains	From 1 July 2013, Sydney Trains replaced CityRail as the provider of metropolitan train services for Sydney.
The Order	Environmental Planning and Assessment (COVID-19 Development – Infrastructure Construction Work Days) Order 2020
The Proposal	The construction and operation of the Banksia Station Upgrade.
The Proposal Site	The area that would be impacted by the Proposal during construction and operation.

Term	Meaning
The Study Area	The Proposal site and the wider area that may be indirectly impacted by the Proposal, which may vary slightly between specialist studies.
Vegetation Offset Guide (Transport for	The Transport for NSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 5.5 of the EP&A Act.
NSW, 2019b)	The guide provides for planting of a minimum of eight trees for each large tree with a diameter at breast height of more than 60 centimetres, four trees where the diameter at breast height is 15-60 centimetres, or two trees where the diameter at breast height is less than 15 centimetres.

Executive summary

Overview

The NSW Government is upgrading Banksia Station to improve accessibility and to prepare for service improvements on the T4 Illawarra Line and South Coast Line. The Banksia Station Upgrade (the Proposal) forms part of two NSW Government initiatives:

- The Transport Access Program, which aims to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure. Under this program, work is proposed to provide a station precinct at Banksia that is accessible to people with a disability, limited mobility, parents/carers with prams and customers with baggage.
- The More Trains, More Services Program that over the next ten years will transform the rail network and provide customers with more reliable, high capacity turn up and go services. This program includes a network reconfiguration strategy that will result in customers boarding and alighting trains at Banksia Station from Platforms 3 and 4 instead of Platforms 1 and 2.

The Proposal includes:

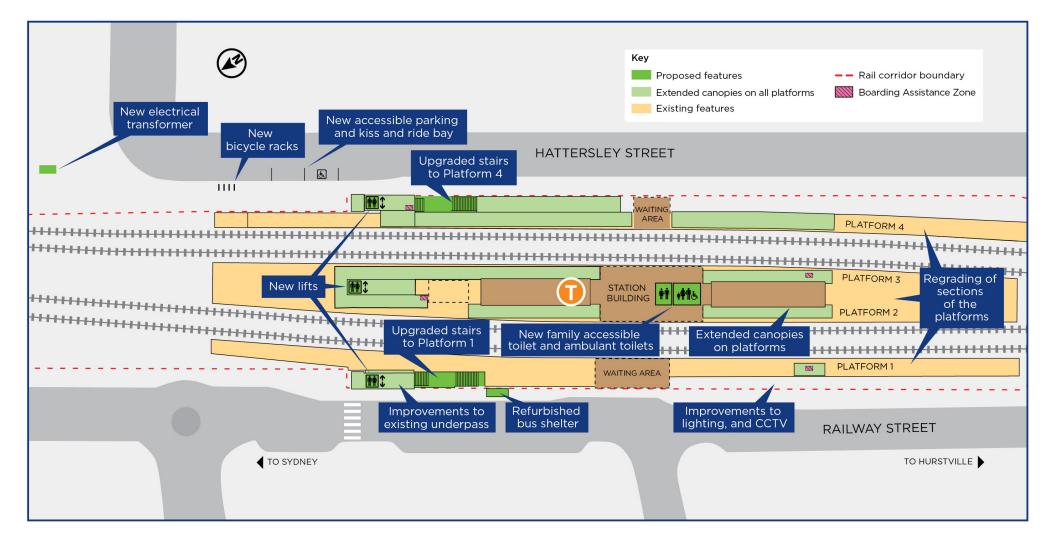
- three new lifts providing access to Platforms 1, 2/3 and 4
- new platform canopies on Platforms 2/3 and 4
- new boarding assistance zone canopy on Platform 1
- a new unisex ambulant toilet and a family accessible toilet in the existing building on Platform 2/3
- a new accessible parking space and kiss and ride space on Hattersley Street
- a widened footpath between the lift and bus stop on Railway Street
- · regrading sections of the platforms
- new lighting, CCTV and wayfinding signage
- electrical and drainage upgrades for new infrastructure.

A detailed description of the Proposal is provided in Chapter 3 of this Review of Environmental Factors (REF). An overview of the Proposal is shown in Figure ES-1 and a photomontage shown in Figure ES-2.

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

This REF has been prepared to assess the environmental impacts associated with 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 start in late 2020 and finish in early 2023.



(Indicative only, subject to detailed design)

Figure ES-1 Key features of the Proposal



(Indicative only, subject to detailed design)

Figure ES-2 Photomontage of the Proposal, viewed from Railway Street

Need for the Proposal

The Proposal would ensure that Banksia Station would meet legislative requirements under the Commonwealth *Disability Discrimination Act 1992* and the Commonwealth *Disability Standards for Accessible Public Transport 2002*. The Proposal would also ensure that customers receive a continuing level of amenity, safety and comfort on Platforms 3 and 4. The canopies proposed for these platforms would encourage customers to spread evenly along these platforms during inclement weather, reducing train dwell times and improving timetable reliability.

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

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

Community and stakeholder consultation

Community consultation activities for the Proposal would be undertaken during the public display period of this REF. Feedback is invited to assist Transport for NSW in understanding what is important to customers and the community. The REF would be displayed for a period of two weeks. An online feedback portal is available for stakeholders at http://www.transport.nsw.gov.au/banksia. 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.

Feedback can be sent to:

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

Or submitted via:

- yoursay.transport.nsw.gov.au/banksia
- the project web page www.transport.nsw.gov.au/banksia

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

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

Transport for NSW develops initial concept design options for the project, including identification and consideration of environmental constraints, risks and opportunities.



We are here

Transport for NSW prepares a Review of Environmental Factors (REF) for public display and invites submissions.



Transport for NSW assesses and responds to feedback and prepares a submission report/determination report with proposed conditions to minimise environmental impacts.



Transport for NSW determines the Proposal.

Conditions of Approval made available
on Transport for NSW website.



Construction commences subject to compliance with conditions.

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 on Platform 2/3 to meet the needs of a growing population
- canopies along Platforms 2/ 3 and 4 that promote the use of the length of these
 platforms, thereby reducing train dwell times and improving timetable reliability. The
 canopy on Platform 1 would provide cover at the lift and the boarding assistance
 zone
- improved accessibility of interchange between train and bus services and private vehicles at Banksia Station
- improved drainage infrastructure in the pedestrian underpass to prevent the nuisance flooding that currently occurs during heavy rain events.

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

- demolition of the lantern structure above the underpass at the northern end of Platform 2/3 and the booking office within the underpass, which form part of the heritage listed Banksia Railway Station Group. Other proposed direct impacts to the Banksia Station heritage item include internal modifications to the Platform 2/3 building, lowering the floor of the Platform 4 waiting room, removing parts of the brick retaining walls along Railway Street and Hattersley Street and regrading some areas on the platforms
- the permanent loss of about two unmarked one-hour parking spaces on Railway Street, immediately south of the bus stop, to accommodate footpath widening work
- the permanent loss of up to five unmarked two-hour parking spaces on the eastern side of Hattersley Street, opposite the station entrance, to accommodate an accessible parking space and a kiss and ride space
- changes to views of Banksia Station from publicly accessible viewpoints on Railway Street and Hattersley Street. The new lifts and canopies would be clearly visible from outside of the station and there would be more restricted views of the heritage buildings on the platforms and across the rail corridor
- temporary disruption to station facilities and amenities during construction, including during scheduled Sydney Trains shutdowns
- removal of one tree at the entrance to the station on Hattersley Street to accommodate one of the proposed lifts
- temporary impacts on local traffic flow associated with construction traffic and partial road closures of Railway Street and Hattersley Street
- temporary changes to vehicular, bus, bicycle and pedestrian access around the station during construction
- temporary reduction in parking availability for customers and local residents during construction

- temporary noise impacts to adjacent residential areas during construction, including periods of weekend work
- minor temporary impacts to air quality from excavation work, stockpiling of excavated material and vehicle emissions.

Further information regarding these impacts and mitigation measures are provided in Chapter 6 and Chapter 7 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 *Environmental Planning and Assessment Regulation 2000*, to ensure that Transport for NSW takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

The detailed design of the Proposal would also be designed in accordance with the Infrastructure Sustainability Council of Australia Infrastructure Sustainability Rating Scheme (v1.2) taking into account the principles of ecologically sustainable development.

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

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

1 Introduction

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

1.1 Overview

The NSW Government is committed to facilitating and encouraging the use of public transport, such as trains, by upgrading stations to make them more accessible, and improving interchanges around stations with other modes of transport such as buses, bicycles and cars. The NSW Government is also committed to building a modern and up-to-date rail system that

will play its part in making Sydney a more productive and liveable city.

1.1.1 Transport Access Program

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

The Transport Access Program aims to provide:

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

1.1.2 More Trains, More Services Program

Over the next ten years the More Trains, More Services Program will simplify and modernise the rail network, creating high capacity and turn-up-and-go services for many customers. Customers will experience more frequent train services, with less wait times, less crowding and more seats on a simpler, more reliable network.

The More Trains, More Services Program is about building a modern and up-to-date rail system that will play its part in making Sydney a more productive and liveable city. The NSW Government's *Future Transport Strategy 2056* (Transport for NSW, 2018a) identifies More Trains, More Services as a priority initiative and is a commitment to the State's transport and infrastructure needs.

More Trains, More Services is key to enabling Greater Sydney Commission's vision for the Greater Sydney Region Plan, *A Metropolis of Three Cities* (Greater Sydney Commission, 2018a), where most residents live within 30 minutes of their jobs, education and health facilities, services and great places.

More Trains, More Services is a program of staged investments that will progressively transform the rail network into a modern and reliable system using world class technology.

The program is already delivering better customer outcomes through timetable enhancements and the integration of the Sydney Metro Northwest with the existing heavy rail network. The current stage of More Trains, More Services will focus on delivering greater capacity, reliability and connectivity for customers on the T4 Eastern Suburbs & Illawarra Line, South Coast Line and T8 Airport & South Line.

These services will be enabled by upgrading and modernising signalling and control systems and using digital technology that, when combined with other infrastructure upgrades, will deliver major increases in the capacity and reliability of the network.

1.2 The Proposal

The Proposal forms part of the Transport Access Program and More Trains, More Services Program. The key features of the Proposal are summarised as follows:

- three new lifts and landings to provide access between Railway Street, Hattersley Street, the existing underpass and the platforms
- upgraded stairs between Platform 1 (Railway Street) and Platform 4 (Hattersley Street) and the underpass to include new compliant handrails, tactile ground surface indicators (TGSIs) and nosing
- new platform canopies on Platform 2/3 and Platform 4
- new boarding assistance zone canopy on Platform 1
- interior changes to the existing station building on Platform 2/3 including a new unisex ambulant toilet and a new family accessible toilet
- upgraded interchange infrastructure around the station including:
 - o a refurbished bus shelter on Railway Street
 - o a new kerb ramp at the Railway Street pedestrian crossing
 - widening of the footpath to 2.5 metres between the lift and bus stop on the eastern side of Railway Street
 - one new accessible car parking space and one kiss and ride space along Hattersley Street
 - o a new kerb ramp at the Hattersley Street entrance
- upgraded surfaces (re-grading/re-surfacing) on all four platforms to provide compliant accessible paths to station amenities and between the new lifts and boarding assistance zones
- upgraded power supply infrastructure including a new transformer (to be installed on land next to Fortescue Reserve)
- upgraded drainage including the installation of new pumps in the underpass and new stormwater pipes to transfer rainfall runoff from the canopies on Platform 2/3 and in the underpass to existing stormwater pipes on Hattersley Street
- ancillary work including adjustments to lighting, electronic ticketing, relocation or replacement of existing customer facilities, improvements to station communications, hearing loops, wayfinding signage and new tactile ground surface indicators (TGSIs).

Subject to planning approval, construction is expected to start in late 2020 and finish in early 2023.

A detailed description of the Proposal is provided in Chapter 3 of this Review of Environmental Factors (REF). An overview of the key features of the Proposal is also provided in Figure 3-1.

1.3 Location and existing infrastructure

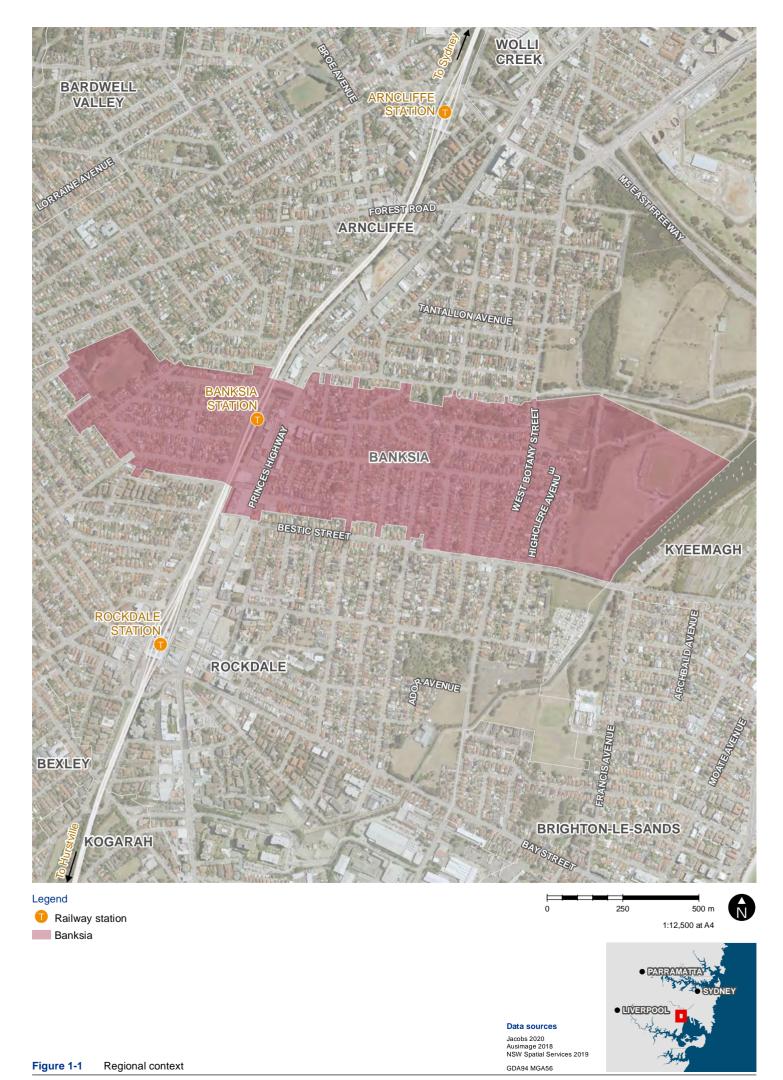
Banksia Station is located on the T4 Illawarra Line in Sydney's south, about 10 kilometres by rail from Central Station. The suburb of Banksia consists of predominantly low density housing and some medium density blocks of flats.

The Proposal study area is generally bounded by Railway Street to the west and the Princes Highway to the east. Banksia local centre is located on the western side of the station and comprises a strip of shops along the western side of Railway Street. There is a mix of detached dwellings and commercial properties associated with the Princes Highway corridor along the eastern side of Hattersley Street at the station.

The Proposal is mostly located within the station itself, and a small section of kerb, footpath and road on Railway Street, Hattersley Street and Taylor Avenue. Additionally, a new transformer is proposed in open space on the north-western corner of the intersection of Hattersley Street and Taylor Avenue, just west of Fortescue Reserve.

Banksia Station is within the Bayside local government area (LGA). The *Rockdale Local Environmental Plan 2011* (Rockdale LEP 2011) applies to the Banksia area and identifies the land use zones within the study area: the rail corridor is zoned SP2 Infrastructure, Banksia local centre is zoned B1 Neighbourhood Centre, land east of the station between Hattersley Street and the Princes Highway is zoned B4 Mixed Use and Fortescue Reserve is zoned RE1 Public Recreation.

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



1.3.1 Station access and facilities

Banksia Station consists of four platforms that are accessed via a pedestrian underpass that provides cross-rail corridor connectivity linking Railway Street and Hattersley Street. Access to the platforms is from the underpass via stairs. There are also stairs at both ends of the underpass to Railway Street and Hattersley Street. From the top of these stairs there are ramps to street level.

The pedestrian infrastructure surrounding the station includes a footpath on the station side of Railway Street that extends from the station entrance to a bus stop. A pedestrian crossing and kerb ramp at the ramp to the underpass provides access to the shops along the western side of Railway Street. On the station side of Hattersley Street, a footpath extends from the station entrance to Fortescue Reserve. This footpath widens to the kerb at the station entrance and includes a bike parking rack and a kerb ramp.

Platforms 1 and 4 are on separate side platforms alongside Railway Street and Hattersley Street respectively. Platform 2/3 are on a single central island platform. Trains arriving on Platforms 1 and 3 proceed to the city via Sydenham. Trains on Platforms 2 and 4 proceed to Hurstville.

There are existing buildings on each of the platforms:

- Platform 1 a small building comprising a covered waiting area that is open to the
 platform and an enclosed store room, located near to the middle of the platform. A
 canopy extends from the building to the edge of the platform.
- Platform 2/3 a large building comprising five rooms in a row: (from north to south) a heritage store room with a door to Platform 3, a waiting room with doors to both Platform 2/3, a female bathroom also with doors to both platforms, a small store room with a door to Platform 2 and a male bathroom with an open doorway and privacy wall. A canopy extends from the building to the edges of both the platforms. There are two other buildings on Platform 2/3: a lantern located directly above the underpass and an enclosure over the stairs between the platforms and the underpass.
- Platform 4 a small building comprising an enclosed waiting room located near the middle of the platform. A canopy extends from the waiting room to the edge of the platform.

A ticket booking office is located in the middle of the underpass opposite the stairs to Platform 2/3. Other existing customer facilities within the station precinct include Opal card readers in the underpass, an Opal top up machine near the ticket booking office and a pay telephone on the northern side of the building on Platform 2/3.

1.3.2 Interchange facilities

Banksia Station does not have a formal commuter parking area and customers generally park on the roads surrounding the station. Parking restrictions on surrounding roads vary from 15 minute parking to unrestricted parking. Informal unrestricted commuter parking is located beneath the trees on the eastern side of Railway Street to the south of the station. There is unrestricted parking along much of Hattersley Street including some 90-degree parking alongside the rail corridor at the southern end of the street. Taylor Avenue also has unrestricted parking.

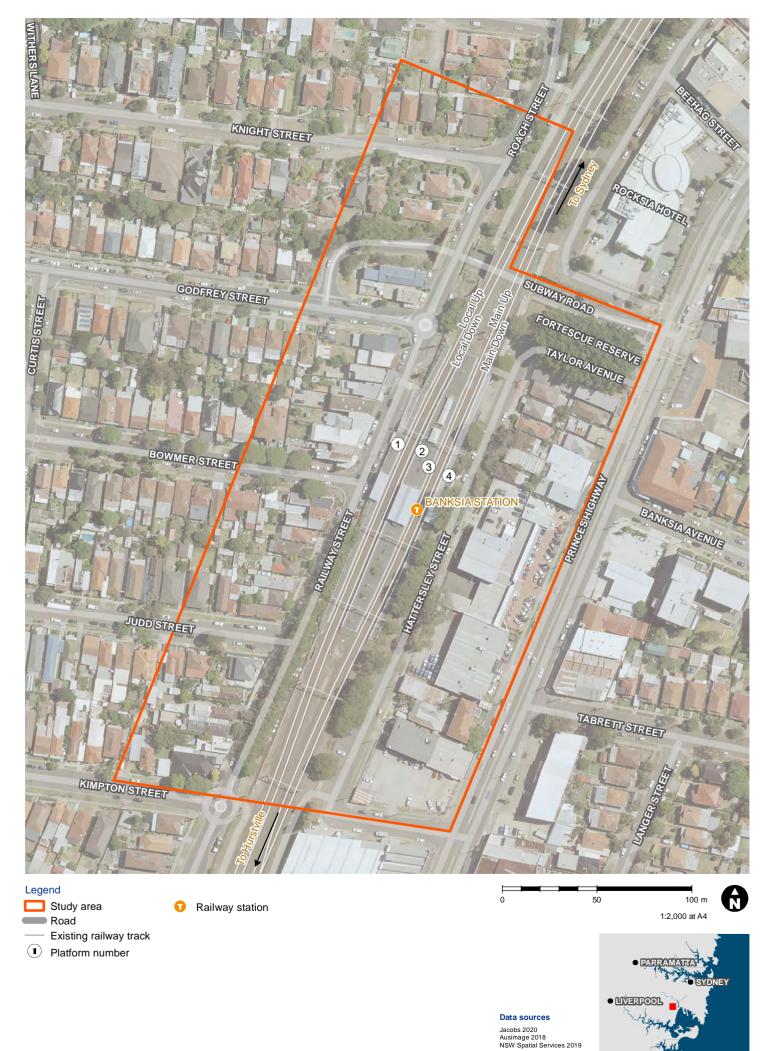
The station does not have a formalised kiss and ride area.

There is a pair of bus stops on Railway Street to the south of the station entrance. These stops service the 420 bus route, operating between Eastgardens and Burwood via Sydney Airport and Rockdale, and night ride services. The bus stop on the eastern side of Railway Street has a shelter while the stop on the western side of the street has a seat only.

A taxi zone is located on the eastern side of Railway Street just north of the station entrance.

An uncovered bike parking rack is provided at the Hattersley Street entrance to the station. About four bikes can be parked in the rack.

The site location of Banksia Station is shown in Figure 1-2. Photos of the existing station infrastructure are shown in Figure 1-3 to Figure 1-7.



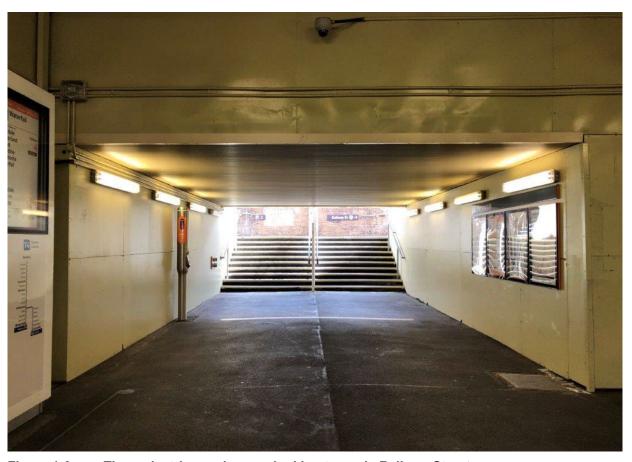


Figure 1-3 The pedestrian underpass looking towards Railway Street



Figure 1-4 Platform 1 building



Figure 1-5 Platform 2/3 building



Figure 1-6 Covered stairs and underpass lantern on Platform 2/3



Figure 1-7 Platform 4 building

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by Transport for NSW to assess the potential impacts of the Proposal. For the purposes of this work, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act* 1979 (EP&A Act).

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

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

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 Minister for the Environment for any necessary approvals under the EPBC Act. Refer to Chapter 4 for more information on statutory considerations.

2 Need and options considered

Chapter 2 discusses the need and objectives of the Proposal, having regard to the objectives of the Transport Access Program and the More Trains, More Services Program (refer to Section 1.1). This chapter also provides a summary of the options that have been considered during development of the Proposal and why the preferred option has been chosen.

2.1 Strategic justification

Improving transport customer experience is the focus of the NSW Government's transport initiatives. Transport interchanges and train stations are the important gateways to the transport system and as such play a critical role in shaping the customer's experience and perception of public transport. 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 Banksia Station Upgrade, the subject of this REF, forms part of the Transport Access Program, which is an initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure. The Proposal would improve accessibility of the station in line with the requirements of the Commonwealth *Disability Discrimination Act 1992* and the *Disability Standards for Accessible Public Transport 2002*.

Banksia Station Upgrade also forms part of the More Trains, More Services Program, which is a program of staged investments that will progressively transform the rail network into a modern and reliable mass transit system using world class digital technology. The program is already delivering better customer outcomes through timetable enhancements and integration of Sydney Metro Northwest with the heavy rail network. The current stage of the More Trains, More Services Program will focus on delivering greater capacity, reliability and connectivity for customers on the T4 Eastern Suburbs & Illawarra Line, South Coast Line and T8 Airport and South Line.

As part of the broader network re-configuration strategy, customers will board and alight trains at Banksia from different platforms and these alternative platforms do not currently have sufficient canopy cover for customer amenity. The Proposal involves canopy upgrades to platforms at these stations to ensure that customers receive a continuing level of amenity, safety and comfort and spread evenly along the platform.

In April 2019, the NSW Government outlined its key policy priorities, which included creating well-connected communities with quality local environments. The Proposal assists in meeting this priority by providing the community of Banksia with greater access to Banksia Station and all the places that it provides connections to. In turn, Banksia would also become a more accessible destination for users of the Sydney Trains network. The Proposal would improve the liveability of the area around Banksia Station.

The Disability Inclusion Action Plan 2018-2022 (Transport for NSW, 2017a) was developed by Transport for NSW in parallel with the development of Future Transport Strategy 2056 (Transport for NSW, 2018a). The plan builds on the objectives of Future Transport Strategy 2056 in relation to accessibility to transport. The Transport Access Program has been identified in this plan as a key action of ensuring transport networks in Sydney are accessible for all potential users.

The Future Transport Strategy 2056 (Transport for NSW 2018a) provides a comprehensive strategy for all modes of transport across NSW over the next 40 years, while also delivering on current commitments. The More Trains, More Services Program is identified in the Future Transport Strategy 2056 (Transport for NSW, 2018a) as a priority initiative and is a commitment to the state's transport and infrastructure needs.

The More Trains, More Services Program is key to enabling the Greater Sydney Commission's vision for the Greater Sydney Region Plan, *A Metropolis of Three Cities*, where most residents live within 20 minutes of their jobs, education and health facilities, services and great places.

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

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

Policy / Strategy **Overview How the Proposal aligns** The Strategy identifies the Future Transport Future Transport Strategy 2056 is an update Strategy 2056 of NSW's Long Term Transport Master Plan. Transport Access Program as (Transport for It is a suite of strategies and plans for delivering on the customer NSW, 2018a) transport to provide an integrated vision for outcome of providing fully the state. accessible transport for all customers by increasing Future Transport Strategy 2056 identifies 12 compliance with the Disability customer outcomes to guide transport Discrimination Act 1992 and investment in Greater Sydney. One of the 12 accompanying disability customer outcomes is to ensure fully standards. accessible transport for all customers. Other customer outcomes include connecting The Proposal similarly assists people and places by providing fast and in achieving this customer convenient interchanging, enhancing the outcome by increasing the liveability of places and delivering transport accessibility of Banksia Station infrastructure that is affordable and makes for all customers. the best use of available resources and The Strategy also identifies the assets. More Trains, More Services Program as providing modern and reliable turn-up-and-go services to customers. The Proposal forms part of the More Trains, More Services Program and would deliver on the customer focus and safety and performance outcomes of the Strategy. The Proposal particularly A Metropolis of The Greater Sydney Region Plan (the Three aligns with Objective 6 of the Three Cities -Cities Plan) is the NSW Government's 40-Three Cities Plan, which is to **Greater Sydney** year land use plan for Sydney. It establishes ensure 'services and Region Plan a vision for a metropolis of three cities – the infrastructure meet Eastern Harbour City, Central River City and (Greater Sydney communities' changing needs'. Western Parkland City. Commission, The Proposal would support 2018a) One of the four main visions identified in the this objective as it would Three Cities Plan relates to increasing the increase the accessibility of liveability of Greater Sydney. Improving Banksia Station. The physical, social and spatial accessibility community of Banksia would across all ages and abilities is identified as have greater access to part of the wider priority of increasing Banksia Station and all the liveability. The Three Cities Plan recognises places that it provides the importance of designing places and connections to. In turn, transport to be accessible by all people as Banksia would also become a the population grows and demographics more accessible destination for change. users of the Sydney Trains network. The Proposal would

improve the liveability of the area around Banksia Station.

Policy / Strategy

Overview

How the Proposal aligns

Eastern City District Plan (Greater Sydney Commission, 2018b)

The Eastern City District Plan is the district level guide for implementing the Greater Sydney Region Plan. This Plan covers the Bayside local government area and is a 20-year plan to manage growth in the context of economic, social and environmental matters to meet the 40-year vision for Greater Sydney.

One of the planning priorities identified in the Plan is to provide 'services and social infrastructure to meet people's changing needs'. In response to the rapidly ageing population and substantial number of residents with a disability in this district, the Plan identifies the need to focus on accessibility, inclusion and safety when designing and building public transport and transport interchanges. This will encourage a greater cross-section of people to lead physically active and socially connected lives.

The Proposal aligns with the vision of the Plan to focus on accessibility and inclusion when designing and building public transport. The Proposal would change the level of accessibility at Banksia Station from not being accessible by wheelchair to being accessible by wheelchair. The Proposal would also improve access for people with limited mobility and parents/carers with prams.

Bayside West Precincts Plan 2036

(Department of Planning and Environment, 2018) The NSW Government's Planned Precincts program aims to ensure that the necessary infrastructure is in place to support the growth of Sydney. The Bayside West Precincts, comprising Cooks Cove and parts of the existing suburbs of Arncliffe and Banksia, were nominated for the Planned Precincts program by the former Rockdale City Council (now Bayside Council). The NSW Government endorsed the nomination in July 2014 (Arncliffe and Banksia) and 2015 (Cooks Cove).

The Bayside West Precincts Plan 2036 sets out strategic land use and infrastructure planning to guide the future transformation of the Bayside West Precincts. The Plan will inform future changes to the planning controls to enable the rezoning of the Arncliffe and Banksia Precincts, through future amendments to the Rockdale LEP 2011).

At Banksia, the Bayside West Precincts extends from the Princes Highway to Railway Street and includes the Proposal site. The Bayside West Precincts Plan 2036 proposes the expansion and revitalisation of Banksia local centre and the rezoning of land between the station and the Princes Highway for higher density housing with mixed use opportunities.

The Proposal is aligned with the Bayside West Precincts Plan 2036 as it would improve accessibility and interchange at Banksia Station and improve the liveability of the area around Banksia Station.

Building Momentum – State Infrastructure Strategy 2018-2038

(Infrastructure NSW, 2018)

The State Infrastructure Strategy 2018-2038 makes recommendations for each of NSW's key infrastructure sectors including transport.

The Strategy recognises that public transport is critical to productivity, expanding employment opportunities by connecting people to jobs and reducing congestion.

A key recommendation in the Strategy is to invest in transport infrastructure that is integrated with land use to create opportunities for agglomeration and enhance productivity, liveability and accessibility.

The Proposal represents an investment by the NSW Government in public transport to improve accessibility, amenity, safety and comfort for customers. These improvements would increase the attractiveness of public transport to residents of Banksia and surrounding areas and may encourage greater patronage.

Policy / Strategy	Overview	How the Proposal aligns
Disability Inclusion Action Plan 2018-2022 (Transport for NSW, 2017a)	The Disability Inclusion Action Plan 2018-2022 was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing organisations within NSW. The Plan contains five overarching key actions including to create liveable communities, accessible systems and processes and accessible customer information technology. The Plan calls for the continued roll-out of the Transport Access Program across NSW to increase accessibility to stations.	The Proposal will principally deliver on the Plan's key action of creating liveable communities. The Proposal will make Banksia a more liveable community for people with a disability by improving accessibility at Banksia Station and interchange at the station to other transport modes including bus, taxi and private vehicle.
Bayside 2030, Community Strategic Plan, 2018–2030 (Bayside Council, 2018)	Bayside 2030 sets out Bayside Council's strategic direction to 2030. It identifies four themes that describe the Bayside of the future. These themes focus on vibrancy, connectivity, sustainability and prosperity.	The Plan envisages a community that can easily travel to work by accessible, reliable public transport. The Proposal will enable this vision at Banksia by making Banksia Station more accessible to the community.

2.1.1 Existing accessibility

BCA Logic was engaged to review accessibility of the existing station and the Proposal. Some of the main aspects of the existing station that were identified as not complying with the *Disability Standards for Accessible Public Transport 2002* include:

- access to the underpass and platforms is via stairs, making these areas inaccessible for wheelchairs
- there is a step at the entry to the Platform 4 waiting room, making it also inaccessible for wheelchairs
- there are no accessible parking spaces
- most existing handrails on stairs are non-compliant
- · there is no family accessible toilet
- existing doorway widths including to waiting areas and toilets are too narrow.

2.2 Objectives of the Proposal

The objectives of the Proposal have been prepared with consideration of the overarching objectives of the Transport Access Program (refer to Section 1.1.1) and the More Trains, More Services Program (refer to Section 1.1.2).

The specific objectives of the Banksia Station Upgrade are to:

- provide a station that is accessible to people with a disability, limited mobility, parents/carers with prams and people with luggage
- improve customer experience by improving accessibility for people with mobility issues (including increased access to station facilities such as the toilets, pay telephone and accessible parking spaces)

- improve pedestrian connectivity between the station and bus stops
- reduce potential pedestrian conflict and crowding points along the platforms
- improve integration with the surrounding precinct
- improve customer safety
- improve wayfinding in and around the station
- respond to the heritage values of the site
- improve customer amenity.

2.3 Options considered

Two main design options were considered for improving accessibility at Banksia Station as part of the Transport Access Program:

- Lifts to connect the platforms to a new footbridge This option proposed a new footbridge over the rail corridor just south of the current underpass. The footbridge would be connected to each platform via a lift and stairs. The lifts between the footbridge and Platform 1 and Platform 4 would also connect to Railway Street and Hattersley Street respectively. New stairs would also be built between Platform 1 and Railway Street and Platform 4 and Hattersley Street. The existing underpass including the stairs between the underpass and the platforms would remain in use in their current state.
- Lifts to connect the platforms to the existing underpass This option proposed new lifts between the existing underpass and the platforms. The lifts between the underpass and Platform 1 and Platform 4 would also connect to Railway Street and Hattersley Street respectively. The existing stairs between the underpass and Platform 1 and Platform 4 would be rebuilt and would include landings at Railway Street and Hattersley Street respectively. The existing ramps from Railway Street and Hattersley Street to the underpass would be removed. The lift between the underpass and Platform 2/3 would be located in the existing booking office. The station manager's office would be relocated from the booking office within the underpass to the existing platform building on Platform 2/3.

Both options would provide similar improvements to accessibility including interchange to other transport modes on Railway Street and Hattersley Street. Both options could also include similar canopies along the platforms.

The underpass option has several benefits compared to the footbridge option:

- Sustainability Adapting the underpass to include lifts to the platforms optimises the
 ongoing use of existing infrastructure at Banksia Station and minimises the amount
 of additional new infrastructure that needs to be maintained. With the footbridge
 option, the existing underpass would be retained and would remain the most direct
 route between the station entrances and the platforms.
- Equitable access All customers would enter the station and access the platforms
 via the underpass. This would provide equitable access for all customers and
 pedestrians crossing the rail corridor between Railway Street and Hattersley Street.
 In comparison, the footbridge option would create a second, less direct means of
 accessing the platforms and crossing the rail corridor. This footbridge option would
 therefore provide a less equitable access than the underpass option.
- Visual impacts The underpass option would maximise the amount of new infrastructure developed below the level of the existing platforms and, therefore, minimise its potential visual impact. In comparison, the footbridge options would introduce a large new structure to the station precinct that could dominate views of

the station from several viewpoints. The underside of the footbridge would need to be at least 6.5 metres above the tracks and the top of the lifts would extend more than six metres above this level.

Different design options were also considered for the canopies proposed on the station platforms. These design options included providing about 20 metres or up to about 80 metres of new canopy on both Platforms 3 and 4, which, combined with the existing canopies at the Platform 2/3 building and Platform 4 waiting room, would provide up to about 40 metres or about 90 metres of canopy cover respectively along both of these platforms. Different design options for the canopies and roofs on the lift shafts and lantern underpass were also investigated to minimise the potential heritage impacts of the Proposal.

2.3.1 The 'do-nothing' option

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

The 'do nothing' option was not considered a feasible alternative as it would be inconsistent with the legislative requirements of the *Disability Discrimination Act 1992* 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.

Under the 'do nothing' option the canopy coverage on the platforms would remain the same and customers would be more likely to wait and board trains where there are existing canopies. This would lead to slower train boarding and longer train dwell times, which would reduce the reliability of the timetable proposed for the T4 Illawarra Line.

The 'do nothing' option was not considered a feasible alternative as it is inconsistent with NSW Government objectives and would not encourage the use of public transport nor meet the needs of the Banksia community.

2.4 Justification for the preferred option

The underpass option was chosen as the preferred option for improving the accessibility at the station as it would provide more equitable access and have fewer impacts on Railway Street and visual amenity than the footbridge option. Additionally, the footbridge option would require significant piling work, which would result in greater construction impacts than the underpass option.

Providing about 90 metres of canopy coverage along Platforms 3 and 4 is the preferred option for providing customer amenity that is supportive of higher frequency train services on the T4 Illawarra Line as it would encourage passengers to spread along a greater length of Platforms 3 and 4 and thereby increase the efficiency of train boarding, reduce train dwell times and increase timetable reliability compared to providing about 20 metres of canopy coverage.

3 Proposal description

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

3.1 The Proposal

As described in Chapter 1, the Proposal involves an upgrade of Banksia Station as part of the Transport Access Program and More Trains, More Services Program which would improve accessibility and amenity for customers. The Proposal would include the following key features:

- three new lifts and landings to provide access between Railway Street, Hattersley Street, the existing underpass and the platforms
- upgraded stairs between Platform 1 (Railway Street) and Platform 4 (Hattersley Street) and the underpass to include new compliant handrails, TGSIs and nosing
- new platform canopies on Platforms 1, 2/3 and 4
- interior changes to the existing station building on Platform 2/3 including a new unisex ambulant toilet and a new family accessible toilet
- upgraded interchange infrastructure around the station including:
 - o a refurbished bus shelter on Railway Street
 - o a new kerb ramp at the Railway Street pedestrian crossing
 - widening of the footpath to 2.5 metres between the lift and bus stop on the eastern side of Railway Street
 - one new accessible car parking space and one kiss and ride space along Hattersley Street
 - o a new kerb ramp at the Hattersley Street entrance
- upgraded surfaces (re-grading/re-surfacing) on all four platforms to provide compliant accessible paths to station amenities and between the new lifts and boarding assistance zones
- upgraded power supply infrastructure including a new transformer (to be installed on land next to Fortescue Reserve)
- upgraded drainage including the installation of new pumps in the underpass and new stormwater pipes to transfer rainfall runoff from the canopies on Platform 2/3 and in the underpass to existing stormwater pipes on Hattersley Street
- ancillary work including adjustments to lighting, electronic ticketing, relocation or replacement of existing customer facilities, improvements to station communications, hearing loops, wayfinding signage and new TGSIs.

Figure 3-1 shows the general layout of key features of the Proposal.

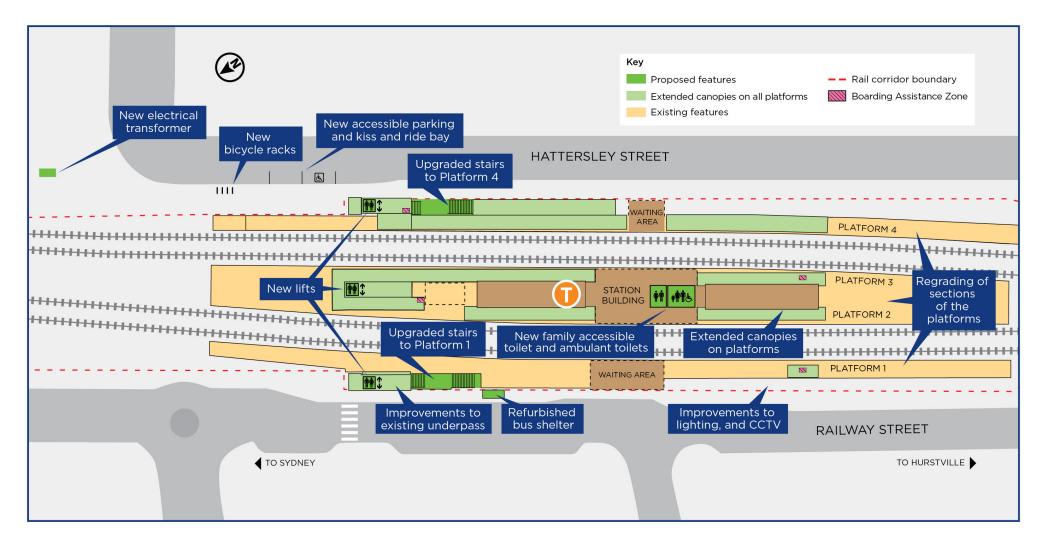


Figure 3-1 Key features of the Proposal

3.2 Scope of work

3.2.1 Station upgrade

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

- construction of three new lifts to provide access between Railway Street, Hattersley Street, the existing underpass and the platforms. Each lift would involve construction of a lift pit, foundation and lift shaft structure. This work would include:
 - construction of a new lift (Lift 1) and landings between Railway Street, the underpass and Platform 1. The existing ramp from Railway Street to the underpass would be demolished
 - construction of a new lift (Lift 2) and landings between the underpass and Platform 2/3. The existing underpass lantern on Platform 2/3 including roof, walls and windows would be demolished. The existing booking office within the underpass would also be demolished
 - construction of a new lift (Lift 3) and landings between Hattersley Street, the underpass and Platform 4. The existing ramp from Hattersley Street to the underpass would be demolished
- upgrade of the existing stairs between the underpass and Platform 1 to include a landing on Railway Street, new compliant handrails, TGSIs and nosing
- upgrade of the existing stairs between the underpass and Platform 4 to include a landing on Hattersley Street and the underpass to include new compliant handrails, TGSIs and nosing
- lowering the floor of the Platform 4 waiting room to provide level access
- construction of a new platform canopy at the boarding assistance zone on Platform 1
- construction of a new platform canopy to provide about 90 metres of canopy coverage along Platform 2/3 between Lift 2, the existing stairs to the underpass, existing platform building and extending to the boarding assistance zone
- construction of a new platform canopy to provide about 90 metres of canopy coverage along Platform 4 from Lift 3 to a point beyond the waiting room
- internal work to the existing building on Platform 2/3 including:
 - o converting the existing heritage store room to become a cleaner's store room
 - converting the existing female toilets to become a new station manager's office.
 This work would involve the permanent closure of the western doorway, installation of new desks and a kitchen and bathroom
 - converting the existing general store room to become a new unisex ambulant toilet. This work would involve installing new fixtures and finishes
 - converting the existing male toilets to become a new family accessible toilet.
 This work would involve removing the existing privacy wall and internal walls, doors and fittings and installing an external door and new fixtures and finishes including a baby change table
- upgrade of the existing surface (regrading/re-surfacing) of Platform 1 either side of the waiting room and extending from the waiting to the boarding access zone to achieve a maximum cross fall of 1:40 and to provide compliant accessible paths and ramps to station amenities

 upgrade of the existing surface of Platform 2/3 between Lift 2 and boarding assistance zones including the areas of the platform around the stairs to the underpass and existing platform building.

3.2.2 Electrical upgrade

An existing overhead wiring structure that spans from Platform 1 to Platform 4 is located where the new stairs to these platforms are proposed. This overhead wiring structure would be removed and a replacement overhead wiring structure would be installed on Platforms 1 and 4 next to the new stairs.

To accommodate power requirements for the Proposal, an upgrade of the existing low voltage electrical supply would be required. The work would include:

- a new pad-mounted transformer located on land next to Fortescue Reserve
- a small section of underground cabling from the transformer to the station
- installation of cabling in new galvanised steel troughing along Platform 4 to the underpass and then along the ceiling of the underpass to a new switchboard new Lift 2
- installation of cabling in a new combined services route under the edge of Platform 2 from near Lift 2 to the proposed switch room in the existing platform building.

3.2.3 Parking, kiss and ride and pedestrian work

Parking, kiss and ride and pedestrians work would include:

- provision of a new kerb ramp at the Railway Street pedestrian crossing
- provision of a 2.5 metre wide pedestrian pathway between the lift and bus stop on the eastern side of Railway Street
- provision of one new accessible car parking space and one kiss and ride space along Hattersley Street
- provision of a new kerb ramp at the Hattersley Street entrance.

3.2.4 Drainage work

Drainage work would include:

- hydraulics work for the lift and canopy downpipe systems
- installation of a grated trench drain around the perimeter of the underpass and regrading of the underpass floor
- installation of new pumps in the underpass and new stormwater pipes to transfer rainfall runoff from the canopies on Platform 2/3 and in the underpass to existing stormwater pipes on Hattersley Street.

3.2.5 Ancillary work

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

- new lighting and public address system
- upgrade all existing TGSIs and safety zone markings to platform edges and stairs
- new/upgraded wayfinding signage and provision of the statutory/regulatory signage

- removal of an existing tree at the Hattersley Street entrance to the underpass and trimming of a tree near to the new transformer proposed near to Fortescue Reserve
- sanitary drainage and potable water adjustments for the station toilets
- temporary relocation of one bench for the installation of the station staff shed on Platform 2/3
- adjustment of the height of the pay telephone at the northern end of the building on Platform 2/3
- temporary removal of the Opal top up machine in the underpass. This would be reinstated in the same location prior to the completion of the work
- temporary site compounds for storage of materials and equipment
- temporary work (where required) during construction to maintain pedestrian access to the station.

3.2.6 Materials and finishes

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

Subject to detailed design, the Proposal would include the following:

- lifts solid base to each lift shaft with painted steel and glass infill panels
- lift cars –stainless steel and glass doors
- lift landings flooring to match the adjacent pavement types
- new canopies steel frame and cladding
- upgraded stairs replace non-compliant handrails, nosing and TGSIs on existing stairs
- regraded platform surface to achieve compliance.

Subsequent design iterations would be submitted to Transport for NSW's Urban Design and Sustainability Review Panel at various stages for comment before being accepted by Transport for NSW.

3.3 Design development

3.3.1 Engineering and environmental constraints

The design development of the Proposal has been influenced by a number of engineering and environmental constraints, including:

- Architecture: the immediate presence of the underpass as an integrated part of the main entry to the station is an important constraint. Furthermore, the flooding issues identified with the existing underpass have had an important impact in the evaluation of preliminary scoping design options
- Earthing, bonding and electrolysis: future and/or existing lightning systems have been designed to maintain a minimum two metre separation to overhead wiring structures

- **Drainage:** drainage design is constrained by existing structures and level interfaces, the proposed drainage structures, and pipe connection interfaces
- **Existing structures:** the placement and integrity of existing structures needed to be considered during the development of the design these structures included the platforms, station buildings, overhead wiring and any associated rail infrastructure within the rail corridor
- Sydney Trains' requirements: modifications for existing structures and new structures within the rail corridor must be designed and constructed with consideration of train impact loads, structural clearances to the track, and safe working provisions
- **Utilities:** utility relocations including electrical, signalling and communication equipment owned by Sydney Trains. Relocation of high voltage and low voltage power lines next to and above the station
- Heritage: Banksia Railway Station Group, including the platform buildings, platforms, underpass and brick retaining walls, is listed as an item of local heritage significance on the RailCorp Section 170 Heritage and Conservation Register
- **Construction access:** Access to the station is to be maintained during the construction process.

3.3.2 Design standards

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

- Disability Standards for Accessible Public Transport 2002 (issued under the Commonwealth Disability Discrimination Act 1992)
- National Construction Code
- relevant Australian Standards
- Asset Standards Authority standards
- Infrastructure Sustainability Council of Australia (ISCA) Infrastructure Sustainability Rating Scheme (v1.2)
- Transport for NSW Urban Design Guidelines
- Guidelines for the Development of Public Transport Interchange Facilities (Ministry of Transport, 2008)
- Crime Prevention Through Environmental Design principles
- Standard for Fixed Guideway Transit and Passenger Rail Systems
- Work, Health and Safety Act 2011
- Disability (Access to Premises Buildings) Standards 2010
- Designing for Pedestrians: A Level of Service Concept, John J Fruin (1971)
- RailCorp Engineering standards
- other Transport for NSW policies and guidelines
- relevant council standards.

3.3.3 Sustainability in design

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

The Banksia Station Upgrade Project is one of a number of projects within the Transport Access Program that is using version 1.2 of the IS rating tool and targeting an 'Excellent' rating. This requires the achievement of between 50 and 75 points out of a possible 100. The rating scheme provides an independent and consistent methodology for the application and evaluation of sustainability outcomes in infrastructure projects.

The detailed design and construction of the Proposal will address the following key issues:

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

3.4 Construction activities

3.4.1 Work methodology

Subject to approval, construction is expected to commence in start in late 2020 and finish in early 2023. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Construction Contractor in consultation with Transport for NSW.

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

Table 3-1 Indicative construction staging for key activities

Activities	Timing
 establish site compounds (i.e. fencing, tree protection zones, site offices, amenities and plant/material storage areas) establish temporary facilities as required (e.g. temporary access stairs, temporary toilets, temporary construction lights etc.) 	Typically standard construction hours (7am to 6pm Monday to Friday and 8am to 1pm Saturday) with some potential out of hours during rail possessions
erect site hoarding as required	
	 establish site compounds (i.e. fencing, tree protection zones, site offices, amenities and plant/material storage areas) establish temporary facilities as required (e.g. temporary access stairs, temporary toilets, temporary construction lights etc.) erect site hoarding as required service location and relocation

Stage	Activities	Timing
Lift work	 removal of the existing station manager's office, store room and communications room within the underpass excavation of lift pits (including temporary shoring if required) piling work for lifts waterproof (as required), install reinforcement, formwork and concrete to form the lift pits erect glass and steel shaft structures install and commission lifts, including fit-out. 	Typically standard construction hours with some potential out of hours during rail possessions
Canopy work	 piling work for canopy footings concrete pour erect steel framework and roof. 	Typically standard construction hours with some potential out of hours during rail possessions
Station building work	 reconfigure existing male and female toilets to allow for a new family accessible toilet and unisex ambulant toilet 	Typically standard construction hours with some potential out-of-hours during rail possessions
Platform modification work	 regrade platform surface install TGSIs along platforms install new platform canopy relocate seating adjust pay telephone height install new Opal card reader 	Standard construction hours or rail possessions
Installation of services and infrastructure	 install station services (station platform information, CCTV, Emergency Help Points, public address (PA) system, lighting and ticketing machines) relocate existing platform infrastructure (e.g. seating and bins) install new seating. 	Typically standard construction hours with some potential out of hours during rail possessions
Finalisation work	 remove temporary construction hoardings and reinstate platform bitumen where required site clean-up. 	Typically standard construction hours with some potential out of hours during rail possessions

3.4.2 Plant and equipment

An indicative list of plant and equipment that would be required is provided below. Additional equipment that would likely to be used would be identified during detailed design by the Construction Contractor.

- trucks
- drilling rig
- 200 tonne crane
- hand held tools and equipment
- small excavator

- concrete trucks and pumps
- additional trucks and cars for general use
- demolition saw
- lighting tower

- franna mobile cranes
- piling rig
- water cart
- concrete pump and truck

3.4.3 Working hours

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

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

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

Out of hours work is required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to ensure the safety of railway workers and operational assets. It is estimated that at least five rail possessions would be utilised to facilitate the work. The key work proposed to occur during rail possessions include:

- service relocations
- platform work including demolition and reconstruction of the stairs between the underpass and Platform 1 and Platform 4
- demolition of the underpass lantern on Platform 2/3 to create a void between these platforms and the underpass and then lifting a piling rig into the underpass through this void
- piling, excavation, shoring and pile capping at the lifts pits, and removal of the spoil generated
- installing a drainage sump and pump in the underpass
- lifting the piling rig out of the underpass
- excavating the canopy and overhead wire structure footings
- installing the lift shaft structures, canopies and overhead wire structures
- regrading platform surfaces and tactile installation.

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

The Minister for Planning and Public Spaces has recently made a number of orders under section 10.17 of the EP&A Act in response to the COVID-19 pandemic. This includes the *Environmental Planning and Assessment (COVID-19 Development – Infrastructure Construction Work Days) Order 2020* (the 'Order'), which applies to construction activities for projects which have been subject to a completed assessment under Division 5.1, or approval under Division 5.2 of the EP&A Act.

The Order extends the standard construction hours to allow infrastructure construction work on Saturday, Sunday and public holidays (7am to 6pm) for projects approved prior to the 9 April 2020 (when the Order commenced).

Should the Proposal be approved, this would occur after 9 April 2020, and therefore the Order would not be applicable. Notwithstanding, Transport for NSW will consider its position with regard to extending standard construction hours consistent with the intention of the Order through the determination process. In the event that Transport for NSW would seek to extend the standard construction hours, the potential environmental impacts of doing so would be further assessed as part of the determination process.

3.4.4 Earthwork

Excavation and earthwork would generally be required for the following:

- the construction of three new lift pits, which would require excavation through Platforms 1 and 4 and the underpass into the existing soil/fill at the proposed lift locations
- the proposed new stairs between Platform 1, Railway Street and the underpass, and between Platform 4, Hattersley Street and the underpass
- removal and relocation of existing platform infrastructure including an overhead wiring structure where the new stairs are proposed on Platform 1 and Platform 4
- piling work for canopy footings
- regrading sections of Platform 1 and Platform 2/3 and lowering of the floors of the Platform 2/3 and Platform 4 waiting rooms and proposed ambulant toilet on Platform 2/3
- the installation of underground low voltage electrical cables between the new transformer next to Fortescue Reserve and the northern end of Platform 4 of the station.

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

3.4.5 Source and quantity of materials

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

3.4.6 Traffic access and vehicle movements

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

- additional vehicle movement on the surrounding road network
- minor disruptions to pedestrian/cyclist movements in and around the station
- temporary increase in walking distance for rail customers during rail possessions
 when the underpass is closed to access the bus stops for train replacement buses
 located on Railway Street (Hattersley Street, Taylor Avenue, Princes Highway,
 Subway Road, Godfrey Street and Railway Street)
- temporary road closures on Railway Street and Hattersley Street to facilitate set up area for cranes
- higher road safety risk levels associated with construction vehicle-pedestrian interactions
- temporary reduced parking availability for customers and local residents.

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 Temporary site facilities

Temporary site facilities would be required to accommodate a site office, amenities, laydown and storage areas for materials, piling rig and crane set up and material delivery areas.

A construction site compound is proposed at the southern end of Hattersley Street in the existing 90-degree parking area alongside the rail corridor. There is a vehicle gate into the rail corridor at this location. This area would be used for a site office including a crib room and toilet facilities. These portable buildings may be double stacked.

Temporary laydown and storage areas are required by the Construction Contractor for plant, equipment, materials, demolition materials being stored for reuse and stockpiles. Four potential laydown areas have been identified:

- Taylor Avenue The portion of the road pavement alongside Fortescue Reserve between Hattersley Street and the Princes Highway that is currently used for street parking.
- Grassed area between the rail corridor and Fortescue Reserve This location is the site of the proposed substation. There is an existing layback section in the kerb to enable vehicles to access this area.
- Intersection of Railway Street, Knight Street and Roach Street The strip of land between the railway tracks and the footpath. The rail corridor boundary fence at this location would be temporarily removed and a temporary fence placed next to the footpath to increase the area available for laydown. A temporary vehicle access gate into the rail corridor would be installed to provide direct access from Railway Street to this laydown area.
- Platform 2/3 A hoarding storage area is proposed at the northern end of Platform 2/3.

Two potential areas for a piling rig, crane set up, and material delivery have been identified:

- Railway Street The portion of the road pavement alongside the station entrance between the pedestrian crossing and bus shelter. The bus zone at this location would need to be temporarily relocated.
- Hattersley Street The portion of the road pavement alongside the station entrance that is signposted as a no stopping zone.

The proposed construction site compound, materials laydown and storage areas and piling rig and crane set up and material delivery areas are shown in Figure 3-2).

Impacts associated with using these areas have been considered in this REF including requirements for rehabilitation.

3.4.8 Service relocation and adjustments

The Proposal has been designed to avoid relocation of services where feasible, however further investigation may be required. It is likely some services may require relocation, including any existing communications and low voltage cables near the proposed lifts.

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

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

3.5 Property acquisition

Transport for NSW propose to permanently acquire the vacant land between the eastern side of the rail corridor and Fortescue Reserve (Lot 1 DP 664831) on which a transformer is proposed to be installed as part of the Proposal. This land is also proposed as a temporary laydown area for construction materials.

3.6 Operation and maintenance

Ongoing operation of the existing station would remain unchanged with Sydney Trains operating and maintaining the station. Structures constructed under this Proposal would be maintained by Sydney Trains.



4 Statutory considerations

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

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The 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 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 Disability Discrimination Act 1992

The Disability Discrimination Act 1992 implements Australia's international human rights obligations under the Convention on the Rights of Persons with Disabilities as well as obligations relating to non-discrimination under other treaties. It protects people with disability against discrimination in many areas of public life including accessing public places. The Act allows for standards to be made, including but not limited to, Disability Standards for Accessible Public Transport 2002, and Disability (Access to Premises – Buildings) Standards 2010.

The Proposal would be designed having regard to the requirements of this Act.

4.2 NSW legislation and regulations

4.2.1 Transport Administration Act 1988

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

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

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

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 Transport for NSW, which do not require development consent under Part 4 of the Act.

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

Clause 228 of the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) prescribes the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has 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 4-1 provides a list of other relevant legislation applicable to the Proposal.

Table 4-1 Other NSW legislation applicable to the Proposal

Applicable legislation	Considerations
Biodiversity Conservation Act 2016	The <i>Biodiversity Conservation Act 2016</i> establishes a framework for assessing and protecting environmental and public interests. The Proposal site does not contain suitable habitat for any listed threatened species, population or ecological community and the Proposal would not impact on any threatened species, population or ecological community (refer to Section 6.7).
Biosecurity Act 2015	Clause 22 requires any person who deals with a biosecurity matter has a duty to ensure that in so far as is reasonably practicable, the potential biosecurity risk is prevented, eliminated or minimised. Appropriate management methods would be implemented during construction if declared noxious weeds in the Bayside LGA are identified at the Proposal site (refer to Section 6.7).
Contaminated Land Management Act 1997	Section 60 of the <i>Contaminated Land Management Act 1997</i> imposes a duty on landowners to notify the Department of Planning, Industry and Environment and potentially investigate and remediate land if contamination is above Environment Protection Authority guideline levels.
	The Proposal site has not been declared under the <i>Contaminated Land Management Act 1997</i> as being significantly contaminated (refer to Section 6.8).

Applicable legislation	Considerations
Heritage Act 1977 (Heritage Act)	Sections 57 and 60 of the Heritage Act require approval for work that may have an impact on items listed on the State Heritage Register. Sections 139 and 140 of the Act similarly require approval where relics are likely to be exposed.
	Section 170 of the Act where items listed on a government agency Heritage and Conservation Register are to be impacted.
	One listed heritage item is located with the Proposal site, the Banksia Railway Station Group. This heritage item is listed on the RailCorp Section 170 Heritage and Conservation Register.
	A Statement of Heritage Impact has been prepared for the Proposal and is summarised in Section 6.4. It identifies that the Proposal would have direct (physical) and indirect (visual) impacts to the Banksia Station heritage item.
	Formal notification is to be provided by the asset owner to the Heritage Council regarding the demolition of structures associated with the Banksia Railway Station Group at least 14 days prior to the demolition of these structures in accordance with Section 170A(1)(c) of the Heritage Act.
	No items of state heritage significance were identified near the Proposal, and therefore an approval under Section 60 of the Heritage Act would not be required.
Land Acquisition (Just Terms Compensation) Act 1991	Property acquisition would need to be managed in accordance with the Land Acquisition (Just Terms Compensation) Act 1991.
Protection of the Environment Operations Act 1997	The Proposal does not involve a 'scheduled activity' under Schedule 1 of the <i>Protection of the Environment Operations Act 1997</i> . Accordingly, an Environment Protection Licence is not required for the Proposal.
	However, in accordance with Part 5.7 of the <i>Protection of the Environment Operations Act 1997</i> , Transport for NSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Construction Contractor.
Roads Act 1993	Section 138 of the <i>Roads Act 1993</i> 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 <i>Roads Act 1993</i> states that public authorities do not require consent for work on unclassified roads.
	The roads surrounding the Proposal site are local roads, managed and maintained by Bayside Council (refer to Section 6.1).
	The Proposal would involve work on Railway Street and Hattersley Street, which are not classified roads. No approvals under the <i>Roads Act 1993</i> are therefore expected to be required.
	However, the work would be undertaken in consultation with Bayside Council including obtaining a road occupancy licence(s) for temporary road closures to facilitate work.
Waste Avoidance and Resource Recovery Act 2001	Transport for NSW would carry out the Proposal having regard to the requirements of the <i>Waste Avoidance and Resource Recovery Act 2001</i> . A site-specific Waste Management Plan would be prepared during detailed design (refer to Section 6.11).

Applicable legislation	Considerations
Water Management Act 2000	Approval under the <i>Water Management Act 2000</i> is required for certain types of developments and activities that are carried out in or near a river, lake or estuary. Under section 91E of the <i>Water Management Act 2000</i> , it is an offence to carry out a controlled activity in, on or under waterfront land unless a controlled activity approval has been issued.
	The Proposal would not involve any water use (from a natural source e.g. aquifer, river – only from the network), water management work, drainage or flood work, controlled activities or aquifer interference.

4.2.4 Key State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

The State Environmental Planning Policy (Infrastructure) 2007 (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.

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.

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 carried out under the requirements of the Infrastructure SEPP.

It is noted that the Infrastructure SEPP prevails over all other environmental planning instruments except where State Environmental Planning Policy (Major Development) 2005, State Environmental Planning Policy (Coastal Management) 2018 applies. The Proposal does not require consideration under these SEPPs and therefore these instruments have not been further considered as part this REF.

State Environmental Planning Policy No 55 - Remediation of Land

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

4.2.5 Rockdale Local Environmental Plan 2011

The Proposal is located within the Bayside LGA (formerly Rockdale LGA). Local environmental plans are prepared by councils for their respective LGAs. There is no local environmental plan for the Bayside LGA at the time this REF was written and therefore the Rockdale LEP 2011 has been considered.

The provisions of the Infrastructure SEPP prevail over local environmental plans. Nevertheless, during the preparation of this REF, the provisions of the Rockdale LEP 2011 were considered.

Figure 4-1 shows the relevant section of the zoning map from the Rockdale LEP 2011, with the indicative location of the Proposal.

Table 4-2 summarises the relevant aspects of the Rockdale LEP 2011 applicable to the Proposal.

Table 4-2 Relevant provisions of the Rockdale LEP 2011

Provision description

Relevance to the Proposal

Clause 2.3 - Zone objectives and Land Use Table

Applicable land zones

Under the Rockdale LEP 2011, the Proposal is located in areas zoned as:

- SP2 Infrastructure (Railway) for the proposed work associated with the station
- B1 Neighbourhood Centre for the proposed work in Railway Street
- B4 Mixed Use for the proposed work in Hattersley Street and Taylor Avenue
- RE1 Public Recreation for the proposed substation between the rail corridor and Fortescue Reserve.

Zone objectives

The objectives of the applicable land zones are as follows:

- SP2 Infrastructure (Railway) 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
- B1 Neighbourhood Centre to provide a range of small-scale retail, business and community uses that serve the needs of people who live or work in the surrounding neighbourhood, to ensure that development within the zone does not detract from the economic viability of the commercial centres in Zone B2 Local Centre and Zone B4 Mixed Use within the local area and to ensure that the nature, scale and type of development is compatible with adjacent residential development.
- B4 Mixed Use to provide a mixture of compatible land uses and to integrate suitable business, office, residential retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.
- RE1 Public Recreation to enable land to be used for public open space or recreational purposes, to provide a range of recreational

Provision description	Relevance to the Proposal
	settings and activities and compatible land uses and to protect and enhance the natural environment for recreational purposes.
	The Proposal is consistent with the objectives of these zones.
	Permissible development within land zones
	Development for the purposes of a rail infrastructure facility is permissible with consent under the provisions of the SP2 Infrastructure (Railway) zone and road development is permissible with consent under the B1 Neighbourhood Centre and B4 Mixed Use zones. However, as the provisions of the Infrastructure SEPP prevail over the Rockdale LEP 2011, development consent from Bayside Council is not required.
Clause 5.10 – Heritage conservation	Clause 5.10 of the Rockdale LEP 2011 aims to conserve the environmental heritage of the local area, the heritage significance of heritage items and heritage conservation areas, archaeological sites and Aboriginal objects and places.
	A discussion of potential impacts to local heritage and the requirements for consent is provided in Section 6.4.
Clause 6.2 – Earthworks	Clause 6.2 of the Rockdale LEP 2011 aims to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land.
	Potential impacts as a result of earthworks are discussed in Section 6.8.
Clause 6.6 – Flood planning	Clause 6.6 of the Rockdale LEP 2011 aims to minimise the flood risk to life and property and flood impacts on the environment.
	The Proposal site for Banksia Station is located in a flood planning area. Potential impacts on flooding are discussed in Section 6.9.
Clause 6.8 – Biodiversity protection	Clause 6.8 of the Rockdale LEP 2011 aims to protect native fauna, flora and ecological processes and encourage the recovery of native fauna and flora and their habitats.
	Potential impacts on biodiversity are discussed in Section 6.7.
Clause 6.9 – Riparian land, watercourses and artificial waterbodies	Clause 6.9 of the Rockdale LEP 2011 aims to protect and maintain water quality, the stability of the bed and banks and ecological processes within watercourses and artificial waterbodies and aquatic riparian habitats.
	Potential impacts on water quality are discussed in Section 6.9.



4.3 Ecologically sustainable development

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

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

The principles of ESD have been adopted by Transport for NSW throughout the development and assessment of the Banksia Station Upgrade. Section 3.3.3 summarises how ESD has been incorporated in the design development of the Proposal. Section 6.12 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 the Banksia Station Upgrade, including a range of Transport for NSW 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.

Workshops and meetings carried out during design development included:

- meeting with Sydney Trains to discuss the potential heritage impacts of the Proposal
- meeting with Bayside Council to discuss temporary facility locations during the construction phase of the Proposal and potential parking impacts during the operational phase of the Proposal
- constructability review workshops
- safety in design workshops including hazard identification and security risk workshops.

Transport for NSW provided project updates to the community in December 2019 and March 2020. The updates informed the community of early investigation work that were required to inform the concept design.

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.

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

Table 5-1 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 Consultation with Councils – development with impacts on council related infrastructure and services	Consultation is required where the Proposal would result in: substantial impact on stormwater management services generating traffic that would place a local road system under strain involve connection to or impact on a council owned sewerage system involve connection to and substantial use of council owned water supply significantly disrupt pedestrian or vehicle movement involve significant excavation to a road surface or footpath for which Council has responsibility.	 The Proposal includes work that would: connect to the stormwater system disrupt pedestrian and vehicle movements impact on road pavements under Council's care and control impact on Council-operated footpaths. Transport for NSW would consult with Bayside Council throughout the public display, detailed design and construction phases of the Proposal.
Clause 14 Consultation with Councils – development with impacts on local heritage	 Where railway station work: substantially impacts on local heritage item (if not also a State heritage item) substantially impacts on a heritage conservation area. 	Banksia Station is not listed on the Rockdale LEP 2011 heritage schedule (refer to Section 6.4). Consultation with Bayside Council is not required in regard to this aspect.
Clause 15 Consultation with Councils – development with impacts on flood liable land	Where railway station work impacts on land that is susceptible to flooding, reference would be made to the Floodplain Development Manual: The Management of Flood Liable Land (Department of Infrastructure, Planning and Natural Resources, 2005).	Banksia Station is located in a flood planning area under the Rockdale LEP 2011. Whilst the Proposal is unlikely to change flood patterns, Transport for NSW would consult with Bayside Council throughout the public display, detailed design and construction phases of the Proposal.
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	Where railway station work impacts on flood liable land, written notice must be given (together with a scope of work) to the State Emergency Service. Any response to the notice received from the State Emergency Service within 21 days after the notice is given must be taken into consideration.	Banksia Station is located in a flood planning area under the Rockdale LEP 2011. Whilst the Proposal is unlikely to change flood patterns, Transport for NSW would consult with the State Emergency Service throughout the public display phase of the Proposal.
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	Where railway station work impacts on land within a coastal vulnerability area and is inconsistent with a certified coastal management program that applies to that land.	Banksia Station is not located on land within the coastal zone. Consultation with Bayside Council is not required in regard to this aspect.

Clause Clause particulars Relevance to the Proposal Clause 16 I For specified development which The Proposal is not located adjacent **Consultation with** includes consultation with the to land reserved under the National public authorities Environment, Energy and Science Parks and Wildlife Act 1974. other than councils Group of the Department of Planning, Accordingly, consultation with the Industry and Environment (former Environment, Energy and Science Office of Environment and Heritage) Group of the Department of Planning, for development that is undertaken Industry and Environment on this adjacent to land reserved under the matter is not required. National Parks and Wildlife Act 1974, Consultation with other public and other agencies specified by the authorities as specified in this clause Infrastructure SEPP where relevant. is not required. However, consultation Although not a specific Infrastructure with Sydney Trains would be ongoing SEPP requirement, other agencies through the next phases of the Transport for NSW may consult with Proposal. could include: Transport for NSW (formerly Roads and Maritime Services) Sydney Trains Heritage NSW. Clause 104 | For traffic-generating development The Proposal is not a development for specified in Column 1 of the Table to **Consultation with** any of the purposes identified in **Transport for NSW** Schedule 3 that involves new premises Column 1 of the Table to Schedule 3. of the relevant size or capacity, or an Consultation with Transport for NSW enlargement or extension of existing is not required in regard to this aspect. premises, being an alteration or addition of the relevant size or capacity written notice of the intention to carry out the development must be given to Transport for NSW in relation to the development. Any response to the notice that is received from Transport for NSW within 21 days after the notice is given must be taken into consideration.

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:

- development of a dedicated web page for the project on the Transport for NSW website which can be found at www.transport.nsw.gov.au/banksia
- public display of the REF on the project web page
- installation of project signage at the station with quick response (QR) codes taking customers to the project web page
- distribution of a project newsletter to the local community via letterbox drop outlining the Proposal and inviting feedback on the REF
- advertisement of the REF public display in local newspapers with a link to the Transport for NSW website that includes a summary of the Proposal and information on how to provide feedback
- consultation with Bayside Council, Sydney Trains and other non-community stakeholders
- targeted social media campaigns
- door knocking local residents and businesses.

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

The REF would be placed on public display on the Transport for NSW website¹ and NSW Government Have Your Say website². Under normal circumstances, printed copies of the REF would be available at varying locations. However, due to the COVID-19 restrictions, these will not be available for this Proposal.

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

¹ https://www.transport.nsw.gov.au/projects/current-projects/banksia-station-upgrade

² https://www.nsw.gov.au/improving-nsw/have-your-say/banksia-station-upgrade

Feedback can be sent to:

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

Or submitted via:

- yoursay.transport.nsw.gov.au/banksia
- the project web page www.transport.nsw.gov.au/banksia

5.4 Aboriginal community involvement

A search for known Aboriginal heritage items in the vicinity of Banksia Station (plus a 200 metre buffer) was carried out on 18 March 2020 using the Aboriginal Heritage Information Management System database maintained by the Environment, Energy and Science Group of the Department of Planning, Industry and Environment. The search confirmed there to be no known Aboriginal heritage items within or close to Banksia Station.

The extensive landscape modification that has occurred across the Proposal study area 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. Therefore, it was not considered necessary to undertake specific Aboriginal consultation.

5.5 Ongoing consultation

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

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

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

5.5.1 Effects of COVID-19 on engagement

In response to the evolving COVID-19 situation, Transport for NSW is following NSW Health advice and changing the way it approaches community consultation for important transport infrastructure projects.

It is important for the community to have their say on all transport infrastructure projects and while this is not business as usual, Transport for NSW will ensure all appropriate community consultation is carried out.

This means consultation will be carried out in different ways, including via social media, teleconferencing and video conferencing, to ensure the community can practice social distancing.

Transport for NSW will continue to deliver projects across NSW, while ensuring the safety of all staff and the community.

6 Environmental impact assessment

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

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

6.1 Traffic and transport

6.1.1 Existing environment

Station access

Banksia Station is accessed via a pedestrian underpass connecting both Railway Street and Hattersley Street with stairs to the station platforms. Entry into the underpass is via ramps followed by stairs at both the Railway Street and Hattersley Street entrances. The existing access is not compliant with *Disability Standards for Accessible Public Transport 2002* (see Section 2.1.1), resulting in its consideration for an upgrade.

Surrounding road network

Banksia Station is located between Railway Street to the west and Hattersley Street to the east (refer to Figure 1-2). Railway Street is a local two-way road that runs parallel to the rail corridor and connects Rockdale to the south and Arncliffe to the north. Hattersley Street is a local two-way road that runs parallel to the station platforms and connects to the Princes Highway at both its northern and southern ends.

The Princes Highway is located to the east of the Proposal site and is a major road running north-south between Sydney and the Victorian border. The Princes Highway is a classified road managed by Transport for NSW. The Princes Highway near the Proposal site is generally three lanes in each direction with a posted speed limit of 60 kilometres per hour. It is the closest road to the Proposal that is approved for B-double heavy vehicles.

Rail corridor access

Vehicle access to the rail corridor near Banksia Station is provided at existing gates at the intersection of Railway Street and Kimpton Street and at the southern end of Hattersley Street. Vehicle access to the rail corridor is shown in Figure 3-2.

Parking

There is no dedicated commuter car park facility at Banksia Station. Customers generally park on surrounding streets including an informal unrestricted parking beneath the trees on the eastern side of Railway Street to the south of the station. Parking at the southern end of Hattersley Street is characterised by three areas of 90-degree parking on the western side of the road alongside the rail corridor.

The station does not have a formalised kiss and ride area. There is taxi zone and bus zone to the north and south respectively of the pedestrian crossing and station entrance on the eastern side of Railway Street. There is a no stopping zone on the western side of Hattersley Street at the station entrance.

Parking restrictions in the study area vary from one hour parking near the station and Banksia local centre to unrestricted parking spaces further away.

The Princes Highway within the study area operates under 'clearway' restrictions, which prohibit kerbside parking and stopping during weekday morning (northbound) and evening (southbound) peak periods.

Public transport

Rail

Banksia Station is on the T4 Eastern Suburbs & Illawarra Line providing services to Bondi Junction, Hurstville, Cronulla, Waterfall and Helensburgh from Central. Trains run from Banksia Station towards the city and Hurstville every 10 minutes in peak periods and every 30 minutes in off peak periods.

Bus

There are bus stops located along either side of Railway Street on the western side of Banksia Station. The southbound bus stop is located about 25 metres south of the station entrance and comprises a small shelter with a seat. The northbound bus stop comprises a seat only and is located just south of the intersection of Railway Street and Bowmer Street, about 100 metres south of the station entrance.

These bus stops are serviced by the following bus services including three NightRide (train replacement) services:

- route 420 Eastgardens to Burwood via Sydney Airport and Rockdale
- route 420N Eastgardens to Burwood via Sydney Airport and Rockdale (night service)
- route N10 Sutherland to City Town Hall
- route N11 Cronulla to City Town Hall
- route N20 Riverwood to City Town Hall via Airport.

Pedestrian infrastructure

There is a pedestrian crossing of Railway Street at the station entrance. There is a kerb ramp at the Hattersley Street entrance to the station.

There is a pedestrian footpath along the station (eastern) side of Railway Street that extends from north of the station to just south of the bus shelter alongside the station platforms. At the Hattersley Street entrance to the station there is a footpath that extends north from the station entrance to Fortescue Reserve and continues through the centre of the park to the intersection of the Princes Highway and Subway Road.

Bicycle facilities

Railway Street is identified on Transport for NSW's Cycleway Finder tool as a high-difficulty on-road bicycle route. A single bike rack with four bicycle parking spaces is provided at the station entrance on Hattersley Street. There are no dedicated bicycle lanes near to the station.

6.1.2 Potential impacts

Construction phase

Haulage routes

As described in Section 3.4, a construction site compound is proposed at the southern end of Hattersley Street and laydown and storage areas for materials are proposed in Taylor Avenue, on the corner of Taylor Avenue and Hattersley Street and at the intersection of Railway Street, Knight Street and Roach Street. The final construction haulage route would be determined by the nominated Construction Contractor during the detailed design of the Proposal. Heavy vehicle access to the Proposal site would be via the Princes Highway. There is no right turn

from the Princes Highway into Hattersley Street or Taylor Avenue and therefore vehicles travelling to the construction site compound and laydown and storage areas on these streets would need to approach from the south. Access to the laydown and storage area at the intersection of Railway Street, Knight Street and Roach Street from the Princes Highway would be via Subway Road and Railway Street. There is a clearance of 4.2 metres beneath the railway bridges over Subway Road.

Traffic

The construction traffic generated by the Proposal would be up to three heavy vehicles and 15 light vehicles per day during standard construction hours. During rail possessions, construction vehicle movements would increase to about 20 light vehicles and 20 heavy vehicles per day. Most construction traffic would be due to construction workers travelling to and from the Proposal site. These vehicles would use the local road network to access the Proposal site. The heavy vehicles would be required for the delivery and removal of materials, plant and equipment. Given the low construction vehicle volumes predicted, this additional traffic is unlikely to impact the performance of the surrounding road network and intersections.

During some rail possessions, one large crane and/or up to three small cranes would be required to load and unload materials, plant and equipment and transfer them between the station platforms or underpass and delivery vehicles as applicable.

Most of the construction work would occur within the rail corridor. However, the work on Railways Street, Hattersley Street and Taylor Avenue (for the footpath, kerb ramp, accessible parking and kiss and ride spaces and temporary laydown areas) could result in traffic impacts due to the need for temporary traffic management controls such as lane closures. However, the work would be relatively fast and any delays on the surrounding road network would be temporary and minor.

Parking

The proposed construction site compound on Hattersley Street in the 90-degree parking area would occupy up to 10 unrestricted parking spaces at this location.

The materials laydown and storage areas on Taylor Avenue and at the intersection of Railway Street, Knight Street and Roach Street would result in a temporary reduction in available street parking when in use:

- Taylor Avenue The laydown area would occupy up to nine unrestricted parking spaces along the northern side of Taylor Avenue between Hattersley Street and the Princes Highway.
- Intersection of Railway Street, Knight Street and Roach Street Up to eight unrestricted parking spaces along the eastern side of Railway Street and Roach Street would be occupied during possessions or when vehicle access to the laydown area is required. These spaces would be required to enable vehicles to enter the rail corridor and for trucks to safely turn into and out of this laydown area.

While there may be a temporary reduction of up to 17 parking spaces at these material laydown and storage areas, the actual impact would depend on which of the laydown areas are in use at any one time and whether the construction site compound and laydown areas occupy the entire areas shown in Figure 3-2. This temporary loss of parking during construction is expected to cause a minor inconvenience to commuters who drive to the station. Some commuters who regularly park their vehicle in Hattersley Street or Taylor Avenue may have to park in other nearby streets that are further from the station.

There would be additional temporary impacts to parking during weekend rail possessions when cranes are operating in Railway Street and/or Hattersley Street. The number of parking spaces impacted would depend on the size of the crane and the nature of the items being lifted. There is reduced demand for parking near the station on weekends and the impact of the temporary loss of parking due to construction occurring during possessions is expected to

cause only a minor inconvenience to businesses and customers in Banksia local centre and local residents.

Figure 6-1 shows the location of these construction parking impacts of the Proposal.

Other temporary impacts to parking would occur during construction when work is occurring on roads, such as widening of the footpath along the eastern side of Railway Street and construction of the accessible parking space and kiss and ride space on Hattersley Street.

Pedestrians and cyclists

Temporary restrictions and disruptions to pedestrian and bicycle access would occur as a result of the following construction activities:

- closure of the underpass during some rail possessions including when cranes are
 required to lift materials, plant and equipment between delivery vehicles and the
 station platforms and underpass from Railway Street and/or Hattersley Street. Users
 of the underpass would be required to detour via Railway Street, Godfrey Street,
 Subway Road, Princes Highway, Taylor Avenue and Hattersley Street, which would
 add about 350 metres to pedestrian and cyclist travel
- upgrading the existing stairs between the underpass and Platform 1 and Platform 4, which would impede customer access to these platforms
- upgrading the footpath on the eastern side of Railway Street between the station entrance and bus shelter, which would impede customer entrance to the station and access to the bus stop.

These impacts to pedestrian and cyclist access would mostly occur during rail possessions, when train services would be replaced by a bus service operating along Railway Street. Pedestrians and cyclists needing to connect between Railway Street and areas to the east of the rail corridor would be more impacted than those connecting between Railway Street and areas to the west of the station.

Emergency vehicle access

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

Operation phase

Pedestrians

The Proposal would allow for accessible movement to and from the underpass, station platforms, external road network and accessible parking spaces. It would also make it easier during wet weather for customers to access the platforms and pedestrians to cross the rail corridor.

The Proposal would improve pedestrian movements within Banksia Station due to the installation of lifts between the underpass, platforms and Railway Street and Hattersley Street entrances, regrading of some platform surfaces and improved access to the waiting room on Platform 4.

The Proposal would make pedestrian movements to and from Banksia Station easier due to:

- new kerb ramps at the station entrances on Railway Street and Hattersley Street
- a wider footpath along the eastern side of Railway Street between the station entrance and bus shelter

- a wider footpath at the station entrance on Hattersley Street where the accessible parking and kiss and ride spaces are proposed
- improvements to the stormwater drainage infrastructure in the underpass, which would reduce the likelihood of the underpass flooding during heavy rainstorms.

Traffic

The Proposal is not anticipated to cause a direct increase in traffic generation during operation.

Parking

The Proposal would provide one new accessible parking space and one new kiss and ride space and remove seven existing parking spaces.

The new accessible parking on the western side of Hattersley Street at the station entrance would benefit customers with a disability and/or limited mobility by providing them with a dedicated parking space that is within a few metres of the new lift to Platform 4 and the pedestrian underpass.

The new kiss and ride space would also be on the western side of Hattersley Street alongside the new accessible parking space. The kiss and ride space would benefit all customers by provided a dedicated location at the station entrance for drop-off and pick-up. It should reduce the occurrence of motorists stopping at informal locations on Hattersley Street to allow passengers drop-off and pick-up, which can lead to traffic congestion and/or safety issues.

There is insufficient road width on Hattersley Street at the station entrance for both the new accessible parking space and kiss and ride space on the eastern side of the road and the existing parking spaces on the eastern side of the road. Up to five unmarked two-hour parking spaces would need to be removed from the eastern side of the road by replacing the current parking signage at this location with signage prohibiting parking. This permanent loss of five parking spaces is expected to inconvenience the residences and businesses at the northern end of Hattersley Street. The time restriction on the five affected parking spaces means most commuters who drive to the station would not be directly impacted. However, if demand for parking remains the same then there would be more competition for all the remaining parking spaces on Hattersley Street and Taylor Avenue.

About two unmarked one-hour parking spaces would also be lost on Railway Street, immediately south of the bus stop, to accommodate footpath widening work. A 2.5 metre wide footpath is proposed between the station entrance and the bus stop and this would require a new kerb that would be further into the road. The new kerb along this widened section of footpath would curve back to tie-in with the existing kerb where these two parking spaces are currently located. The permanent loss of these two parking spaces within the Banksia local centre would make it a little more inconvenient for customers of these businesses to travel there by car.

Figure 6-1 shows the location of the operational parking impacts of the Proposal.



Public transport

The proposed canopies on Platforms 3 and 4 would facilitate efficient boarding of trains by encouraging customers to spread evenly along these platforms during inclement weather. This would reduce train dwell times at Banksia Station and improve the reliability of the timetable proposed for the T4 Illawarra Line.

The refurbished bus shelter proposed on the eastern side of Railway Street at Banksia Station, together with the proposed accessibility upgrades to the station and the footpath between this bus stop and the station entrance would enable accessible interchange between train and bus services at Banksia. This would improve the liveability of Banksia for both local residents and visitors to the area.

6.1.3 Mitigation measures

Construction

The following general mitigation measures are recommended to minimise the potential traffic and transport impacts during construction of the Proposal (refer to Table 7-1 for a full list of proposed mitigation measures):

- prior to the commencement of construction, a Construction Traffic Management Plan 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 access to Banksia Station, Banksia local centre, Fortescue Reserve and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made)
 - managing impacts and changes to on and off-street parking
 - ensuring parking locations for construction workers are away from Banksia Station and Banksia local centre and details of how this will be monitored for compliance
 - designating routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses
 - details for temporarily relocating the taxi rank and bus stop on Railway Street, if required, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired
 - consulting with Bayside Council during preparation of the Construction Traffic Management Plan and obtaining necessary road occupancy licences for temporary road closures. The performance of all project traffic arrangements would be monitored during construction
- communication would be provided to the community and local residents via notifications and signage to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work
- suitable vehicle and pedestrian provisions would be maintained throughout construction to ensure that pedestrian connectivity is not impacted as a part of the work and that suitable and safe paths are provided
- qualified traffic controllers would be used during construction work to ensure safe and efficient movement of vehicle and pedestrian traffic around the work site as well

as in and out of construction compounds and laydown areas and in and out of the rail corridor

- fencing and barriers would be installed between the construction site and outside the construction zone to ensure safe and easy navigation of pedestrians and cyclists
- all work with the potential to impact pedestrian movements such a lifting should be carried out during scheduled weekend rail possessions.

Operation

Transport for NSW would work with Bayside Council to investigate potential locations where new parking spaces could be created to offset the permanent loss of seven parking spaces at Banksia Station. These investigations would focus on Hattersley Street and nearby areas.

6.2 Landscape and visual amenity

This section provides a summary of the *Banksia Station Upgrade Visual Impact Assessment* prepared by Jacobs (2020) (Technical Paper 1). The methodology used to carry out this assessment is provided in Section 1 of Technical Paper 1. The assessment included a desktop analysis and site inspection to identify the potential visual impacts of the Proposal on views to Banksia Station from surrounding publicly accessible areas and views within the station across the platforms.

6.2.1 Existing environment

Banksia Station is located on an embankment supported by retaining walls between Railway Street and Hattersley Street. The landform rises gradually to the north to the railway bridge over Subway Road, and descends gradually to the south, becoming generally level with the intersection of Railway Street and Kimpton Street and southern end of Hattersley Street.

Banksia Station is a local landmark, particularly the platforms and station buildings and also the mural painted on the retaining wall and rear of the Platform 1 waiting room and store on Railway Street. The station consists of two side platforms either side of an island platform that are connected by stairs to a pedestrian underpass between Railway Street and Hattersley Street.

The side platforms are characterised by small timber waiting rooms near the middle of these platforms. A large timber building in the middle of the island platform accommodates a heritage store room, waiting room, store room and toilets. There are covered stairs between the underpass and the island platform. There is also a lantern structure above the underpass at the northern end of the island platform. The rail corridor includes numerous power poles and overhead wiring structures.

The boundary of the rail corridor along Railway Street is characterised by a low brick retaining wall at the rear of Platform 1. At the southern end of the platform the retaining wall supports a garden bed behind the platform fence. Starting from south of the intersection of Railway Street and Bowmer Street there is a row of large Camphor Laurel (*Cinnamomum camphora*) trees along the eastern side of Railway Street, ending just north of the intersection of Railway Street and Kimpton Street. These trees restrict views of the station from this section of Railway Street.

The boundary of the rail corridor along Hattersley Street is also characterised by a low brick retaining wall at the rear of Platform 4. South of the Platform 4 waiting room building the retaining wall supports a garden bed behind the platform fence. Starting from the Platform 4 waiting room building there are a mix of large Brush Box (*Lophostemon confertus*) and Camphor Laurel (*Cinnamomum camphora*) trees along the inside boundary of the rail corridor and the western side of Hattersley Street, ending at the southern end of Hattersley Street. These trees restrict views of the station from this section of Hattersley Street.

The station is located within a well-established suburban area of Banksia. Development of the land to the west of the station comprises a strip of shops along the western side of Railway Street at the station surrounded by low density residential development. Development of the land to the east of the station comprises mostly commercial development associated with the Princes Highway corridor, a small number of detached dwellings opposite the station entrance on Hattersley Street and Fortescue Reserve to the north-east of the station. Fortescue Reserve is characterised by large Morton Bay Fig (*Ficus macrophyllal*) trees along the southern (Taylor Avenue) boundary of the park with a footpath that cross the park diagonally from the station to the intersection of the Princes Highway and Subway Road.

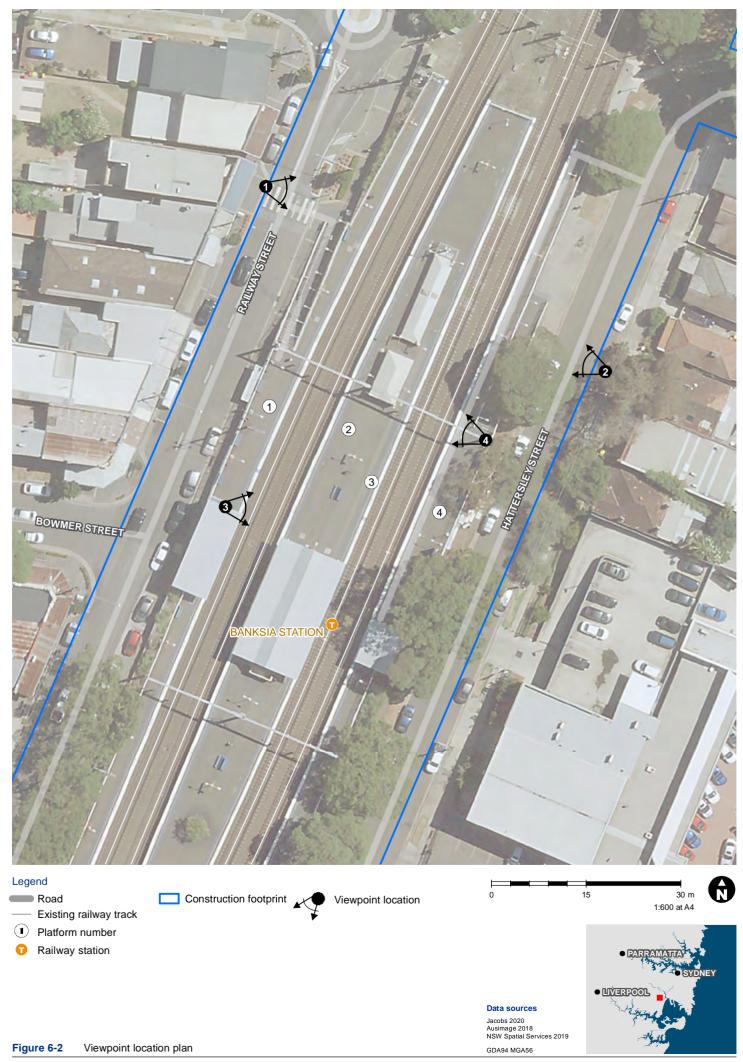
At night, the Proposal is in an area that is well lit due to street lights on Railway Street and Hattersley Street as well as lighting from nearby commercial, retail and residential properties.

6.2.2 Potential impacts

Four viewpoints were selected as representative of the range of views to and within Banksia Station from key publicly accessible locations

- Viewpoint 1 The view from the western side of Railway Street at the pedestrian
 crossing looking south-east towards the station entrance and the retaining wall along
 the rear of Platform 1 (refer to Figure 6-3). Visually dominant features at this location
 include the brick retaining wall along the rear of Platform 1, the painted mural on the
 retaining wall and the rear of the Platform 1 waiting room, white loop-top fencing atop
 the retaining wall and at the station entrance, overhead wire structures across the
 railway tracks and power poles and wires along the edge of the rail corridor.
- Viewpoint 2 The view from the eastern side of Hattersley Street looking south-west and west towards the retaining wall along the rear of Platform 4 and the station entrance (refer to Figure 6-5 and Figure 6-7). Visually dominant features at this location include the brick retaining wall along the rear of Platform 4, white loop-top fencing atop the retaining wall and at the station entrance, an overhead wire structure, a large Brush Box (*Lophostemon confertus*) tree at the station entrance and vehicles parked along the kerb.
- Viewpoint 3 The view from Platform 1 adjacent to the waiting room looking north-east and east towards Platform 2/3 and beyond this to Platform 4 (refer to Figure 6-9 and Figure 6-11). Visually dominant features at this location include Platform 2/3, an overhead wire structure across the railway tracks and associated overhead wiring, the stair lantern over the stairs between the pedestrian underpass and Platform 2/3, the lantern on Platform 2/3 above the pedestrian underpass and the Platform 2/3 building.
- Viewpoint 4 The view from the top of the stairs to Platform 4 looking west and south-west towards the centre of Platform 2/3 (refer to Figure 6-13 and Figure 6-15). Visually dominant features at the location include Platform 2/3, the building on Platform 2/3 with the Platform 1 waiting room beyond, overhead wiring and the second storeys of the buildings on the western side of Railway Street.

The location of each viewpoint is shown in Figure 6-2.



Construction phase

Views during the daytime

Table 6-1 summarises the daytime visual impacts during construction assessed at each of the representative viewpoint locations.

Table 6-1 Assessment of visual impacts during construction of the Proposal

Viewpoint	Assessment of visual impact	Impact rating
Viewpoint 1 – View looking south-east from Railway Street pedestrian crossing	The construction activity at the station entrance on Railway Street would dominate this view and would be a noticeable change. Construction activities in this view would include the loading and unloading of materials, plant and equipment to and from delivery vehicles on Railway Street and lifting of these onto the platforms and into the underpass, excavation of the pit for the lift between the underpass, Railway Street and Platform 1 followed by erection of the lift shaft and installation of the lift, replacement of the stairs between the underpass and Platform 1 and widening of the footpath between the station entrance and bus stop, alongside the retaining wall at the rear of Platform 1.	High
Viewpoint 2 – View looking west from Hattersley Street at the station entrance	The construction activity at the station entrance on Hattersley Street would dominate this view. This would include the loading and unloading of materials, plant and equipment to and from delivery vehicles on Hattersley Street and lifting of these onto the platforms and into the underpass, excavation of the pit for the lift between the underpass, Hattersley Street and Platform 4 followed by erection of the lift shaft and installation of the lift, replacement of the stairs between the underpass and Platform 4, erection of canopies on Platform 4 and work on Hattersley Street for the accessible parking space and kiss and ride space.	High
	The proposed construction compound and laydown area on the verge alongside the stairs between the underpass and Platform 4 would also be clearly visible in this view but may also obscure some of the work associated with the new stairs between the underpass and Platform 4.	
	The removal of the large Brush Box (<i>Lophostemon confertus</i>) tree at the station entrance on Hattersley street would result in there being no screening from this viewpoint of the lift shaft between the underpass and Platform 4 and the canopy on Platform 4 near the lift.	
Viewpoint 3 – View looking north-east from next to the Platform 1 waiting room	The construction activity at the northern ends of Platform 2/3 and Platform 4 would be a noticeable change and would dominate this view. Platform 1 would not be accessible to customers during those weekend rail possessions when work would be carried out at the station. Customers would be able to see work carried out during standard construction hours and the state of work sites during the periods between weekend rail possessions. This would include hoarding are the demolished lantern over the underpass on Platform 2/3, erection of the lift shafts above Platform 2/3 and Platform 4 and installation of these lifts and erection of canopies on Platform 2/3 and Platform 4.	Moderate to High

Viewpoint	Assessment of visual impact	Impact rating
Viewpoint 4 – View looking south-west from the top of the stairs on Platform 4	The construction activity at the platform building on Platform 2/3 would be visible from this view. Platform 4 would not be accessible to customers during those weekend rail possessions when work would be carried out at the station. Customers would be able to see work carried out during standard construction hours and the state of work sites during the periods between weekend rail possessions. This would include hoarding are the platform building on Platform 2/3 and erection of canopies on Platform 2/3.	Moderate to High

Views at night

The construction work site and construction compounds and laydown areas would be lit for safety when work occurs at night. This would primarily occur when work is carried out during weekend rail possessions. Generally, any lighting of the construction work site and construction compounds and laydown areas would be visually absorbed into the surrounding brightly lit environment of the station and surrounding development.

The construction work would create a minor reduction in visual amenity at night. There would be negligible adverse visual impacts at night during the construction work.

Urban design and landscape character

The Proposal would require the removal of one large Brush Box (*Lophostemon confertus*) on the western side of Hattersley Street at the station entrance. The removal of this tree would result in a reduction in the landscape quality at the entrance to the station on Hattersley Street. The Proposal would also require trimming of another large Brush Box (*Lophostemon confertus*) near to the new transformer proposed near to Fortescue Reserve.

Operation phase

Views during the daytime

Table 6-2 summarises the daytime visual impacts during operation assessed at each of the representative viewpoint locations.

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

Viewpoint	Assessment of visual impact	Impact rating
Viewpoint 1 – View looking south- east from Railway Street pedestrian crossing	The upgrade work would substantially alter the view of the station entrance on Railway Street. The lift structure between the underpass, Railway Street and Platform 1 would be a new and prominent feature in this view (refer to Figure 6-4). Due to the elevated nature of Banksia Station, the new lift structure height on Platform 1 would appear accentuated and would dominate the view. Beyond this the lift shafts on Platform 2/3 and Platform 4 and new canopies extending along these platforms from these lifts would also be partially visible. The widened footpath along the eastern side of	Moderate
	Railway Street between the station entrance and upgraded bus shelter would provide a clearer interchange pathway between rail and bus services and reinforce the station precinct's transport interchange function.	

Other more subtle changes to this view would include the new stairs between the underpass, Railway Street and Platform 1, which would not be that dissimilar to the existing stairs between this platform and the underpass. The northern end of the existing mural on the retaining wall at the rear of Platform 1 that faces Railway Street would be removed where the new stairs are located. The rest of the mural would remain intact (refer to Figure 6-4).

Overall, the scale and massing of the new lifts and canopies would obstruct views to the heritage platform buildings from Railway Street. However, over time the new infrastructure and canopies would appear consistent with other rail infrastructure in view.

Viewpoint 2 – View looking west from Hattersley Street at the station entrance

The upgrade work would result in a noticeable change in the views of the station from this location. The removal of the tree at the station entrance would open up a clear unobstructed view to the lift structure and new canopies (refer to Figure 6-8). The lift shaft would be seen in the centre of the view. Beyond this the lift shafts on Platform 2/3 and Platform 1 and new canopies extending Platform 4 and Platform 2/3 from the lifts would also be partially visible.

Other more subtle changes to this view would include the new stairs between the underpass, Hattersley Street and Platform 4 (refer to Figure 6-6), which would not be that dissimilar to the existing stairs between this platform and the underpass.

The new accessible parking space and kiss and ride space would be another minor change to this view.

Overall, the scale and massing of the new lifts and canopies would obstruct views to the heritage platform buildings from Hattersley Street.

Over time the new infrastructure and canopies would appear consistent with other rail infrastructure in view.

Moderate

Viewpoint	Assessment of visual impact	Impact rating
Viewpoint 3 – View looking north-east from next to the Platform 1 waiting room	The upgrade work would result in the view from Platform 1 looking across to the northern ends of Platform 2/3 and Platform 4 having a much greater concentration of station infrastructure (refer to Figure 6-10 and Figure 6-12). The new lift structures on these platforms would become a dominant element in this view. The new canopies extending from the lifts on these platforms would reduce views to areas east of the station. The existing heritage structures within the view including the roof over the stairs between Platform 2/3 and the underpass would become less prominent. The loss of the heritage lantern over the underpass would also be apparent from this view. Over time the new infrastructure and canopies would appear consistent with other rail infrastructure in view.	Moderate
Viewpoint 4 – View looking south-west from the top of the stairs on Platform 4	The upgrade work would result in the view from Platform 4 looking across to the middle of Platform 2/3 and Platform 1 having a much greater concentration of station infrastructure (refer to Figure 6-13 to Figure 6-16). The new canopy on Platform 2/3 would prevent the existing building on this platform from being viewed in its entirety. This canopy together with the lift structures on Platform 2/3 and Platform 1 would also reduce views to areas west of the station. Over time the new infrastructure and canopies would appear consistent with other rail infrastructure in view.	Moderate



Figure 6-3 Viewpoint 1 – View looking south-east from the top of the stairs on Platform 4



Figure 6-4 Photomontage of the Proposal during operation from viewpoint 1



Figure 6-5 Viewpoint 2 – View looking south-west from Hattersley Street at the station entrance



Figure 6-6 Photomontage of the Proposal during operation looking south-west from viewpoint 2

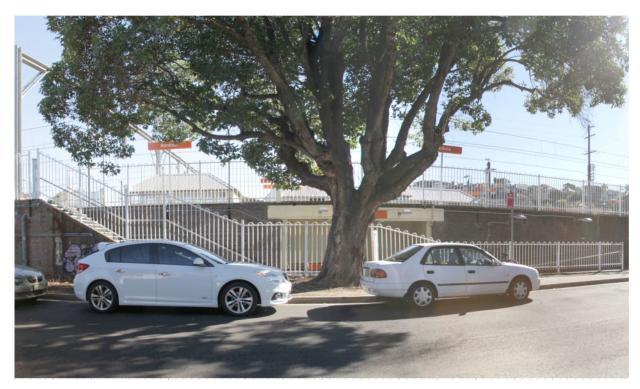


Figure 6-7 Viewpoint 2 – View looking west from Hattersley Street at the station entrance



Figure 6-8 Photomontage of the Proposal during operation looking west from viewpoint 2



Figure 6-9 Viewpoint 3 – View looking north-east from next to the Platform 1 waiting room



Figure 6-10 Photomontage of the Proposal during operation looking north from viewpoint 3



Figure 6-11 Viewpoint 3 – View looking east from next to the Platform 1 waiting room



Figure 6-12 Photomontage of the Proposal during operation looking east from viewpoint 3



Figure 6-13 Viewpoint 4 – View looking south-west from Railway Street pedestrian crossing



Figure 6-14 Photomontage of the Proposal during operation looking south-west from viewpoint 4



Figure 6-15 Viewpoint 4 – View looking west from Railway Street pedestrian crossing



Figure 6-16 Photomontage of the Proposal during operation looking west from viewpoint 4

Views at night

During operation, the upgraded station would continue to be brightly lit for security and safe use at night. Additional lighting would be installed for the new lifts and on the platforms. The canopies and lift structures would provide some shielding of this additional lighting, however, the station's position on an embankment would limit this shielding benefit.

Generally, the character of the proposed station upgrade at night would be visually absorbed into the surrounding brightly lit station environment and the legibility of the precinct would be improved. Overall, the visibility of the station at night would be increased during operation.

Urban design and landscape character

During operation, there would be a substantial improvement to accessibility created by the introduction of lifts, improvements to the platform levels and TGSIs, new platform-level canopies and improvements to the footpath alongside the station on Railway Street. There would be less shade at the Hattersley Street entrance to the station due to the removal of a large Brush Box (*Lophostemon confertus*) tree. However, this would be offset by improved amenity at this entrance as a result of the new kiss and ride space and more direct access between Hattersley Street and Platform 4 via either the new stairs or lift.

6.2.3 Mitigation measures

The following mitigation measures are proposed to manage the potential visual impacts of the Proposal (refer to Table 7-1 for a full list of proposed mitigation measures):

- Detailed design of the Proposal would consider the following mitigation measures to reduce the visual impact and create a development that is in keeping with the character of Banksia Station. These measures include:
 - select materials to be consistent with existing elements found within the station.
 A colour palette that is complementary to the heritage character of Banksia
 Station would be selected
 - where possible, the design would reduce the bulk and dominance of the lift structures from the public domain
 - consider the inclusion of additional landscaping to offset the removal of the street tree in Hattersley Street and also assist to filtering views to the elevated lift structures.
- all permanent lighting should be designed and installed in accordance with the requirements of AS 1428.2 Design for Access and Mobility – Enhanced and Additional Requirements – Buildings and Facilities
- worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations
- temporary hoardings, barriers, traffic management and signage would be removed when no longer required
- during construction, graffiti would be removed in accordance with Transport for NSW's standard requirements
- the detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles
- light spill from the construction area into adjacent visually sensitive properties would be minimised.

6.3 Noise and vibration

This section provides a summary of the *Banksia Station Noise and Vibration Impact Assessment* prepared by Renzo Tonin & Associates (2020) (Technical Paper 2). The methodology used to carry out this assessment is provided in Section 1 of Technical Paper 2. The assessment included a desktop analysis and noise monitoring to identify the potential noise and vibration impacts of the Proposal on sensitive receivers in areas surrounding Banksia Station.

6.3.1 Existing environment

Sensitive receivers

Receivers identified within the study area have all been categorised as either residential or commercial, with the commercial receivers located in Banksia local centre on the western side of Railway Street at the station and along the eastern side of the rail corridor associated with the Princes Highway corridor. There are a small number of residential receivers on the eastern side of Hattersley Street at the station entrance. Receivers near Banksia Station have been categorised in Appendix B of Technical Paper 2. Sensitive receivers near to the Proposal are identified in Table 6-3.

Table 6-3 Sensitive receivers near the Proposal

Receiver type	Name / Address	Distance to the Proposal (metres)	
Residential	74, 76, 78, 80 and 84 Hattersley Street	15	
Residential	18A, 20, 21, 1/24, 26 and	20	
Place of worship	St Savvas of Kalymnos Orthodox Church & Community	80	
Hotel	Banksia Hotel	80	
Hotel	Rocksia Hotel	100	
Educational	Bambino's Kindergarten Banksia	190	
Childcare centre	Pineapple Club Family Day Care	300	

Background noise levels

Unattended noise monitoring was carried out for a continuous period between Wednesday 8 May 2019 and Wednesday 15 May 2019 to measure ambient and background noise levels around Banksia Station. The noise monitor was placed outside a residential dwelling at 32 Railway Street, near the southern end of Platform 1 (refer to Figure 6-17). The noise environment at this monitoring site was observed to be characterised by general urban noises including light traffic on Railway Street and tree leaves rustling. Trains were audible and a dominant noise when present. Aircraft taking off from Sydney Airport and passing overhead were associated with spikes in noise of up to 79 decibels (dB(A)).

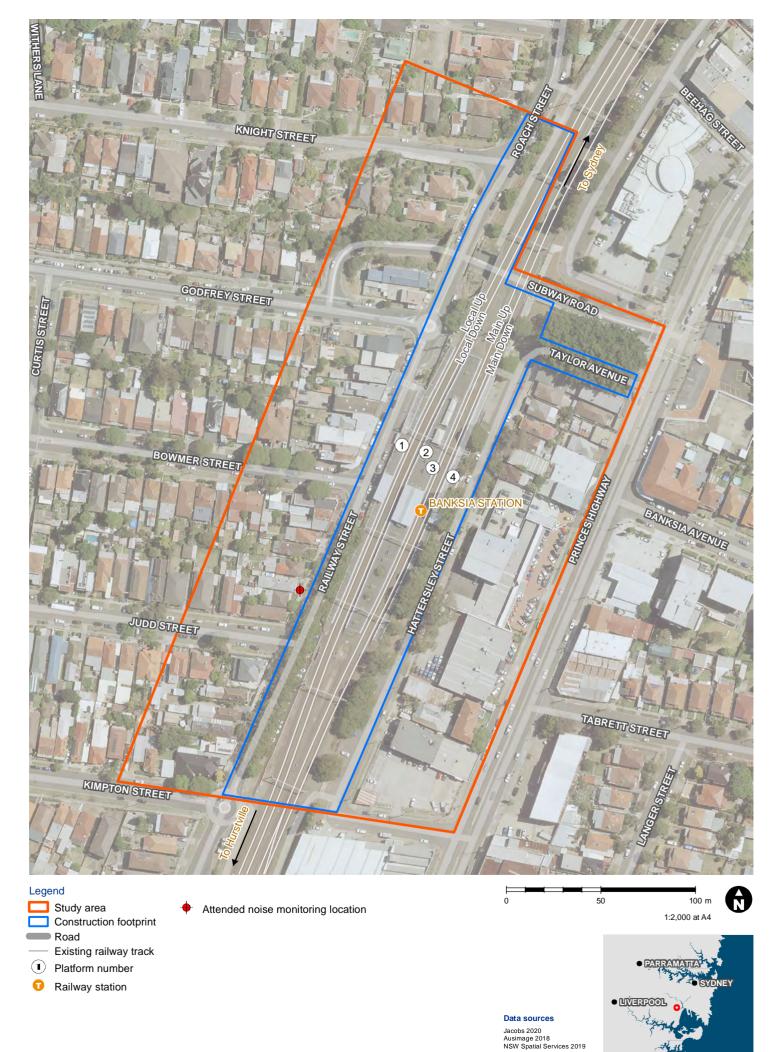
The unattended noise monitoring data was used to determine background noise levels for each day, evening and night period monitored. These periods are defined in the *Noise Policy for Industry* (NPfI) (EPA, 2017) as:

- day 7:00 am to 6:00 pm Monday to Saturday and 8:00 am to 6:00 pm Sundays and public holidays
- evening 6:00 pm to 10:00 pm Monday to Sunday and public holidays
- night 10:00 pm to 7:00 am Monday to Saturday and 10:00 pm to 8:00 am Sundays and public holidays.

Rating background levels (RBLs) for each period were then determined based on the median background noise levels for these periods and are presented in Table 6-4.

Table 6-4 Measured existing ambient and background noise levels, dB(A)

Noise logger	Location description	Rating background level			Ambient noise levels L _{Aeq 15 minute}		
no.		Day	Evening	Night	Day	Evening	Night
M1	32 Railway St, Banksia	47	49	39	63	64	60



6.3.2 Potential impacts

Construction phase

The *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009) (ICNG) provides guidance for assessing noise generated during the construction phase of developments. Noise management levels identified in the ICNG for residential receivers are presented in Table 6-5.

Table 6-5 Construction noise management levels in the ICNG for residential receivers

Time of day	Construction noise management level L _{Aeq (15min)}		
Recommended standard construction hours:	Noise affected: RBL + 10dB		
Monday to Friday 7 am to 6pm Saturday 8 am to 1pm	Highly noise affected: 75 dB(A)		
No work on Sundays or public holidays			
Outside recommended standard construction hours	Noise affected: RBL + 5 dB		

The likelihood of sleep disturbance during the night period was assessed by adopting a sleep disturbance screening level that is the higher of $L_{A90(15min)}$ + 15 dB(A) or 55 dB(A).

The construction noise management levels for residential receivers near to the Proposal are presented in Table 6-6 for work during the recommended standard construction hours ('standard') and outside of the recommended standard construction hours (OOH).

Table 6-6 Construction noise management levels at residential receivers, db(A)

Rating background level L _{A90, 15 minute}		Noise management level (L _{Aeq, 15 minute})				Sleep disturbance (L _{A1(1min)})		
Day	Evening	Night	Day (Standard)	Day (OOH)	Evening (OOH)	Night (OOH)	Screening level	Awakening reaction
47	49	39	57	52	52 ¹	44	55	65

Notes

In line with the direction in Section 2.3 of the NPfl, as the community generally expects greater control of noise during the more sensitive evening and night-time periods than during the less sensitive daytime period, the construction noise management level for the evening period is set at no greater than the daytime level.

Construction noise emissions were predicted by modelling the noise sources, receiver locations and construction activities across 13 construction scenarios and comparing the results to the noise management levels for each time period in Table 6-6.

The modelling indicates that during standard construction hours, in a worst-case scenario construction noise would range from being clearly audible to being moderately intrusive at residential receivers located opposite to the station along Railway Street and Hattersley Street when work is occurring at the closest point to these receivers. These noise impacts would generally be greater for residential receivers to the east of the station (i.e. along Hattersley Street) than to the west (along Railway Street). When these same activities are modelled to occur outside of the standard construction hours, they would range from being mostly clearly audible or moderately intrusive to highly intrusive for certain high noise impact activities.

The modelling also indicates that there is potential for sleep disturbance at the receivers closest to the station. Activities that have the potential to result in sleep disturbance are high

instantaneous noise events such as metal-on-metal clangs/bangs (i.e. excavator buckets), air releases from equipment with compressed air or high instantaneous noise events caused by hand tools. If these activities can be avoided outside of standard construction hours the predicted noise levels from instantaneous noise events are more likely to be within the sleep disturbance noise management level.

Construction vibration criteria were also defined for the Proposal. The assessment was particularly focussed on work proposed near to structures that form part of the heritage-listed Banksia Railway Station Group. The assessment identified that there is low risk of vibration impact as a result of the construction of the Proposal with the exception of the station buildings/structure itself. Recommended minimum working distances for vibration intensive plant are provided in Table 6-7.

Table 6-7 Recommended minimum working distances for vibration intensive plant

Plant item	Rating /	Maximum working distance (metres)				
	description	Cosmetic	Human			
		Unreinforced or light framed structures	Structurally unsound heritage structures	response		
Excavator with small hydraulic hammer	5 to 12 tonne excavator	2	10	7		
Piling rig (rotary bored)	Less than or equal to 800 millimetres	2 (nominal)	5	Not applicable		
Jackhammer	Handheld	1 (nominal)	5	Avoid contact with structure		

Operation phase

Public address system reconfiguration

The potential operational noise impacts of the Proposal were also assessed and focussed on the proposed reconfiguration of the existing public address system that is used to provide announcements on network status information, impending train arrivals and emergency messages. Public address system speakers would be spread along the new canopies proposed on Platform 2/3 and Platform 4 as well as comparable locations on Platform 1. This would result in some public address system speakers being closer to sensitive receivers, which are currently located next to the existing station buildings only.

The duration and infrequency of announcements from the public address system means that they are unlikely to significantly contribute to the overall average noise levels, provided they are designed appropriately.

Public address systems are typically controlled by software that allows for automatic adjustment of announcement volume to account for ambient noise level via appropriately located sensors. These systems will automatically reduce the announcement volumes when ambient noise levels are low, while still maintaining a sufficient level of audibility for commuters. Conversely when noise levels are higher, the PA volume adjusts accordingly. These self-adjusting systems are particularly important for periods with the most potential for annoyance, such as during the night time.

Due to the close proximity of residential receivers to Banksia Station, it will be important that the public address system is designed to minimise noise spill from the station platform, even where self-adjustment is incorporated.

Noise impacts at nearby receivers due to public address announcements have been assessed assuming the noise level during an announcement would be 10 dB above the ambient noise levels at receivers standing along the station platform. This is typical of a self-adjusting system to ensure sufficient speech intelligibility on the platform. The modelling indicates that the noise of the public address system at the nearest residential receivers has the potential to exceed the project's noise trigger levels based on the recommended amenity noise levels contained in the NPfI if the public address system is not designed to minimise noise spill away from the platforms.

6.3.3 Mitigation measures

The following mitigation measures are proposed to manage the potential noise and vibration impacts of the Proposal (refer to Table 7-1 for a full list of proposed mitigation measures):

- prior to commencement of work, a Construction Noise and Vibration Management
 Plan would be prepared and implemented in accordance with the requirements of the
 Interim Construction Noise Guideline (Department of Environment and Climate
 Change, 2009) and Construction Noise and Vibration Strategy (Transport for NSW,
 2019b). The Construction Noise and Vibration Management Plan would take into
 consideration measures for reducing the source noise levels of construction
 equipment by construction planning and equipment selection where practicable.
- the Construction Noise and Vibration Management Plan would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered include:
 - regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise
 - avoiding any unnecessary noise when carrying out manual operations and when operating plant
 - o ensuring spoil is placed and not dropped into awaiting trucks
 - avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable
 - switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off while being unloaded
 - o avoiding deliveries at night/evenings wherever practicable
 - o no idling of delivery trucks
 - keeping truck drivers informed of designated heavy 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
- the Construction Noise and Vibration Management Plan would include measures to reduce the construction noise and vibration impacts from mechanical activities.
 Reasonable and feasible noise mitigation options which would be considered include:
 - maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances

- using the most suitable equipment necessary for the construction work at any one time
- directing noise-emitting plant away from sensitive receivers
- regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc
- using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours work
- using quieter and less vibration emitting construction methods where feasible and reasonable
- work would generally be carried out during standard construction hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Any work outside these hours may be carried out if approved by Transport for NSW and the community is notified prior to this work commencing. An Out of Hours Work application form would need to be prepared by the Construction Contractor and submitted to the Transport for NSW Environment and Planning Manager for any work outside normal hours
- where the L_{Aeq (15minute)} construction noise levels are predicted to exceed 75 dBA and/or 30 dBA above the rating background level at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with Transport for NSW's Construction Noise and Vibration Strategy (Transport for NSW, 2019b). 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 carried out in accordance with the minimum working distances for vibration intensive plant identified in Table 6-7. Attended vibration monitoring or vibration trials would be carried out where these distances are required to be challenged
- to effectively mitigate potential impacts of vibration on the heritage structures within the station, activities that cause vibration are to be managed in accordance with British Standard BS 7385-2:1993 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz). If a heritage building or structure is found to be structurally unsound (following inspection) a more conservative cosmetic damage objective of 2.5 millimetres per second peak component particle velocity (from DIN 4150) shall be considered. Real time vibration monitoring is to be conducted at commencement of relevant work to confirm compliance with the adopted standard. If vibration levels approach the determined trigger level, then the construction activity shall cease and the heritage structure is to be assessed and alternative construction methodologies developed, where practicable, before construction
- vibration resulting from construction and received at any structure outside of the Proposal site 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)
 - o 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)

- property conditions surveys would be completed prior to piling, excavation of bulk fill
 or any vibratory work including jack hammering and compaction for all
 buildings/structures/roads with a plan distance of 20 metres from the work
- high noise impact construction activities would be carried out in continuous blocks of up to three hours. Respite from high noise impact activities would be provided between each block for at least one hour. No high noise impact activities would be carried out during this one hour respite period
- high noise generating construction plant and equipment would not be used during the night period
- condition surveys of all structures that form part of the Banksia Railway Station
 Group heritage listing and are not proposed for demolition would be completed prior to the commencement of construction work
- site specific minimum working distances for vibration significant plant items would be
 measured on site where plant and equipment is likely to operate close to or within
 the recommended minimum working distances for cosmetic damage. Where plant is
 required to operate within site specific minimum working distances, vibration
 monitoring is recommended to verify that vibration levels achieve compliance with
 the structural damage objectives. Where monitoring above identifies that vibration is
 likely to exceed the structural damage objectives, a different construction method
 with lower source vibration levels should be considered
- appropriate performance criteria for the public address system along the station
 platforms would be specified as part of detailed design of the Proposal to ensure
 compliance with the noise emission requirements at nearby sensitive receivers.

6.4 Non-Aboriginal heritage

This section provides a summary of the *Banksia Station Upgrade Statement of Heritage Impact* prepared by Jacobs (2020) (Technical Paper 3). The methodology used to carry out this assessment is provided in Section 1.4 of Technical Paper 3.

6.4.1 Existing environment

Historical background

In 1881, the NSW Government announced plans to construct a railway line from the Illawarra Junction (the location of the Erskineville Junction) to Hurstville. Construction of a twin tracks between the Illawarra Junction and Hurstville commenced in October 1882. The Illawarra Line opened in July 1884, with Hurstville Station operating as a terminus (Singleton, 1984).

The land associated with the suburb of Banksia was originally part of a land grant made to Simeon Henry Pearce and James Pearce's in 1854 that extended from Rockdale to Brighton-Le-Sands. Portions of the grant were subsequently sold off to prospective buyers, who utilised the heavily timbered area for tree-felling and timber-getting (Pollon and Healy 1988).

The formation and growth of Banksia as a suburb heavily relied on the construction of Banksia Station in 1906. The construction of the station resulted from a petition signed by 480 local land owners in May 1901. The petition called for the construction of a station platform as land owners were apprehensive about developing their allotments until a station was constructed (Pollon and Healy 1988).

The 1906 Banksia Station comprised an island platform and a small station building (the current Platform 2/3 building) that were accessed by a pedestrian footbridge.

Banksia Station was one of the many railway stations that were upgraded following the quadruplication of the Illawarra Line in the early 1920s. The upgrade of Banksia Station occurred in 1923 to 1924 and included:

- two side platforms (Platforms 1 and 4) with small waiting rooms located about halfway along each platform
- a pedestrian underpass linking all four platforms to Railway Street and Hattersley Street
- stairs between the original island platform (Platform 2/3) and the new underpass
- two large lanterns with boxed gabled roof forms at the northern end of Platform 2/3 to enable air circulation from the underpass below
- a booking office within the underpass
- the addition of toilets within the existing Platform 2/3 building.

The underpass proved to be prone to flooding, as evidenced by a 1933 newspaper article which reported that 'flood water damaged the line between Kingsgrove and Dumbleton (now Beverly Hills) and trains could not travel over that section. Water rose to a height of 6 feet in the subway at Banksia Railway Station and train passengers had to climb through a fence to enter the carriages' (Anonymous, 1933).

There have been no substantial modifications made to Banksia Station since the 1923 upgrade. Incremental changes have occurred across the staff offices, passenger facilities, brick facing and other station superstructure, primarily related to modernisation and/or amenity. The booking office contains a modern office fit-out that 'floats' within the original space, brickwork has been painted, toilets and other functional spaces have been upgraded over time and some doorways and windows on the Platform 2/3 building have been blocked off.

Listed heritage items

A search of the following databases was carried out on 2 July 2020 to identify statutory heritage listed items within the study area:

- Australian Heritage Database
- State Heritage Inventory, which includes items listed on the State Heritage Register, Section 170 Heritage and Conservation Registers and in LEPs including Rockdale LEP 2011.

The only heritage item directly impacted by the Proposal is Banksia Railway Station Group, which is listed on the Section 170 Heritage and Conservation Register maintained by RailCorp. There is one local heritage items listed under Schedule 5 of the Rockdale LEP 2011 within the study area but outside the footprint of the Proposal. This item is a stone house at 7 Godfrey Street.

Figure 6-18 shows the locations of heritage items within the study area.

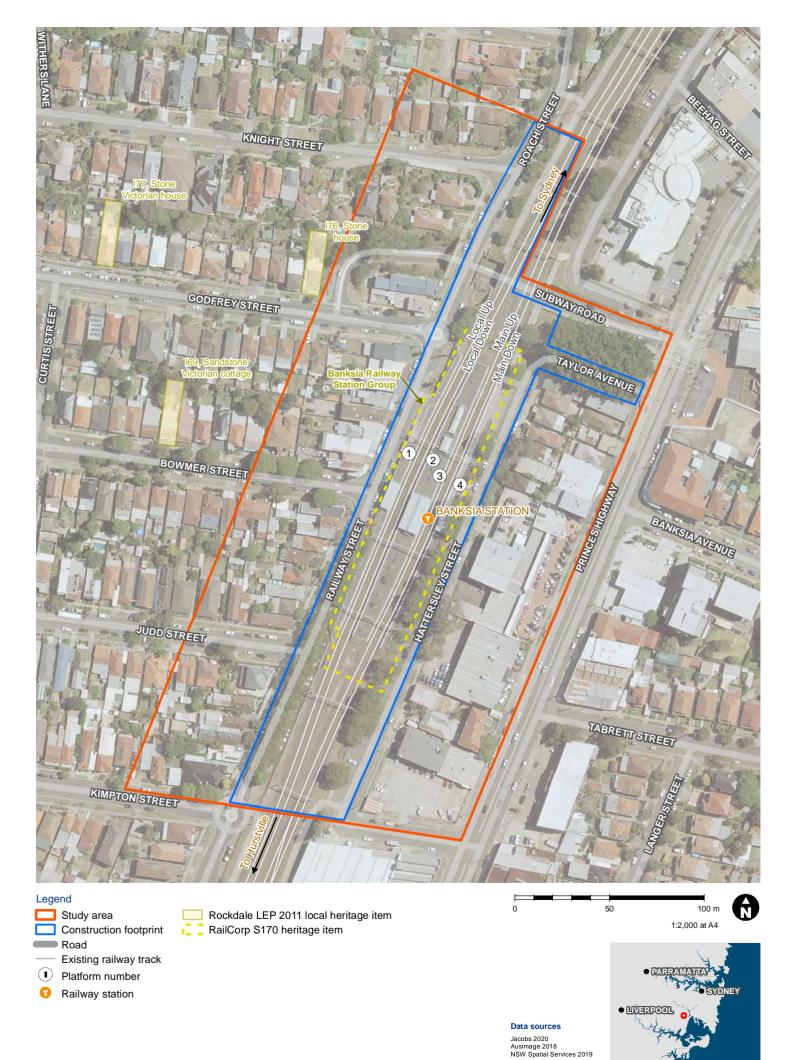
Banksia Railway Station Group

The curtilage of the Banksia Railway Station Group is bounded in the north by a line across the railway tracks level with the northern side of Godfrey Street; to the east by the boundary of the railway property fronting Hattersley Street, incorporating the retaining wall at the rear of Platform 4; to the south by a line across the railway tracks level with the southern side of Judd Street and to the west by the boundary of the railway property fronting Railway Street, incorporating the retaining wall at the rear of Platform 1 (refer to Figure 6-18).

The listing recognises the Banksia Railway Station Group, inclusive of the platform buildings, platforms, pedestrian subway and brick retaining wall, as being of local heritage significance.

The statement of significance in the listing recognises the following aspects of the station as having heritage significance:

- Historical significance The station is of historical significance as part of the early 20th century upgrading of the T4 Illawarra Line, its buildings illustrating the progress of this upgrading from 1906 to 1923. The station is also of historical significance for its role as a major transport hub for the suburb of Banksia since 1906, and for its role in the development of the suburb of Banksia.
- Aesthetic significance The station is of aesthetic significance for its 1906 building on Platform 2/3, 1923 buildings on Platforms 1 and 4 and 1923 pedestrian underpass, booking office and retaining walls, as intact representative railway station structures of their periods.
- Social significance The station has the potential to contribute to the local community's sense of place and can provide a connection to the local community's past.
- Research significance The station is of research significance for its ability to demonstrate design and construction techniques of the NSW Railways in the early 20th century (1906 to 1923).
- Rarity The 1923 pedestrian underpass, with its retaining walls and painted signage, is rare on the T4 Illawarra Line, being the only known example.
- Representativeness The station is representative within the T4 Illawarra Line context as a station that combines buildings from two periods 1906 and 1923 and includes a pedestrian underpass.



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6.4.2 Potential impacts

The potential heritage impacts of the Proposal have been categorised into four impact levels:

- *Neutral* Actions or activities that would result in a very minor change or impact to the heritage item. Generally, no mitigation is required.
- *Minor* Actions or activities that would result in a minor alteration to the heritage item. Generally, these actions can be mitigated.
- *Moderate* Actions or activities that would result in a modification to the heritage item, including its setting or landscape. These impacts may be partially mitigated.
- Major Actions or activities that would result in a long-term or otherwise substantial
 modification to a heritage item, its setting or landscape. These actions cannot be fully
 mitigated.

Construction phase

The proposed construction work would have a direct (physical) impact to heritage fabric. The heritage impact of the work has been categorised for each of the proposed work activities that would affect heritage fabric:

- Lift to Platform 2/3 The excavation for, and construction of, the Platform 2/3 lift structure would require the demolition of both the underpass lantern structure and the booking office within the underpass. As one of the major platform-level structures within the station precinct with a direct relationship to the rare pedestrian underpass, the removal of the lantern structure represents a major direct impact to the station's heritage fabric. This is also true of the removal of the booking office, which is substantially intact beyond the current office fit-out. The work required for the lift to Platform 2/3 would have a major direct (physical) impact to the Banksia Station heritage item.
- Lifts and stairs to Platforms 1 and 4 The proposed lift structures on Platforms 1 and 4 would involve the removal of some platform fabric and a portion of the original brick retaining walls on both these platforms. This work would have a minor direct (physical) impact to the Banksia Station heritage item.
- New platform canopies Piling work would occur on the platform surfaces to enable the installation of supports for the proposed new canopies. The platforms are consistent with early brick platforms, which comprise a packed earth structure with masonry retaining walls. The existing concrete coping is a later addition and was likely originally brick coping and an asphalt surface. Depending on the depth of the piling work, there is potential for the work to breach through the modern additions into original fabric. This work would have a neutral direct (physical) impact to heritage fabric.
- Regrading platforms If the proposed regrading of the platforms requires
 modification to the platform buildings, there would be the potential for a minor direct
 (physical) impact to the Banksia Station heritage item. However, if the regrading
 work does not impact the platform buildings or otherwise modify existing heritage
 fabric, this work may be of neutral direct (physical) impact.
- Lowering the floor of the Platform 4 waiting room The removal of the original floor of the Platform 4 waiting room would have a moderate direct impact to the heritage item. However, if the original floors can be salvaged and reinstated at the new floor level then the impact of this work would reduce to minor.
- Modifications to the Platform 2/3 building The Platform 2/3 building is the largest and oldest of the extant structures at the station. The work proposed to the

Platform 2/3 building would have a neutral to moderate direct (physical) impact on heritage fabric:

- The demolition of the existing women's toilets to construct the station manager's office would have the greatest potential direct impact to heritage fabric of all the modifications proposed to the Platform 2/3 building. The original women's toilet is substantially intact and the removal of heritage fabric and modification of this space would reduce the integrity of the station building as a whole. This work would have a moderate direct (physical) impact to the Banksia Station heritage item.
- The proposed widening of the waiting room doorway and installation of a new louvre system would require the removal of the existing door and transom architraves and removal of brick fabric along the door margin. This work would have a minor direct (physical) impact to the heritage item.
- The conversion of the existing men's toilets into a family accessible toilet would require the removal and replacement of existing tiling and finishes and the addition of new bathroom hardware. It would also necessitate the removal of an existing brick privacy wall and nib walls. As some of this fabric is historical in nature (though not original), this work would result in a minor direct (physical) impact to the heritage item overall.
- The proposed conversion of the existing cistern room into an ambulant toilet would require the permanent closure of an original doorway on the Platform 2/3 building's eastern elevation and construction of a stud wall. As this room currently retains original fabric and detailing, the obscuring and/or removal of this fabric in conjunction with additional fixtures into original brickwork represents a minor direct (physical) impact to the Platform 2/3 station building, and a neutral direct (physical) impact to the heritage item overall.
- Electrical upgrade The relocation of an overhead wire structure would require new
 fixtures within the platform surfaces, however, this would only have a neutral direct
 (physical) impact. The fixture of new steel troughing and combined services routes to
 Platforms 2/3 and 4 would likewise constitute a neutral direct impact to the heritage
 item.
- Other work The remaining proposed work (including landscape and streetscape work, drainage work, ancillary work and temporary site facilities) would have a neutral direct (physical) impact to the heritage item.

Operation phase

The operation of the Proposal would have an indirect (visual) impact on the Banksia Station heritage item. The design of the proposal minimises the scale of the proposed new infrastructure so that the primary heritage elements, such as the Platform 2/3 building, remain the dominant feature. The proposed new infrastructure would have the following indirect (visual) impacts on the Banksia Station heritage item:

- Lift to Platform 2/3 As previously noted, the lift between the pedestrian underpass and Platform 2/3 would require the complete demolition of the underpass lantern and the booking office within the underpass. Though the design of the lift would have some design characteristics from the original underpass lantern, the new lift shaft would be a prominent feature and the overall indirect (visual) impact of the lift structure on the Banksia Station heritage item would be moderate.
- Lifts and stairs to Platforms 1 and 4 The lift structures on Platforms 1 and 4 would be visible from street level at Railway Street and Hattersley Street and would obscure views of the heritage features of the station from some viewpoints. The

proposed scale, form, and material of the new lifts would result in a moderate indirect (visual) impact on the Banksia Station heritage item.

- New platform canopies The proposed canopies would greatly increase the visual bulk of built forms present on the platforms and creates a visual obstruction of views to and from the heritage buildings on the platforms, reducing the sense of open space and discrete nature of the platform buildings, which is an integral part of their aesthetic appeal. The visual impact of the proposed canopies is assessed as a major indirect (visual) impact. There is potential during detailed design of the proposal to refine the canopy design such that its indirect (visual) impact on the heritage item would reduce to moderate.
- Modifications to the Platform 2/3 building The modifications to the men's toilet entry would remove brick fabric from the elevation of the Platform 2/3 building through the widening of the toilet entrance doorway. This work would cause a minor indirect (visual) impact to heritage item. The other proposed modifications to the Platform 2/3 building would have a neutral indirect (visual) impact.
- Electrical upgrade The fixture of new steel troughing and combined services routes to Platforms 2/3 and 4 would have the potential for a minor indirect (visual) impact if the materials used are not visually recessive. The other proposed electrical upgrade work would have a neutral indirect (visual) impact to the heritage item.
- Other work The remaining proposed work (landscape and streetscape work, drainage work, ancillary work and temporary site facilities) would have a neutral direct (physical) impact to the heritage item.

6.4.3 Mitigation measures

The following mitigation measures are proposed to manage the potential non-Aboriginal heritage impacts of the Proposal (refer to Table 7-1 for a full list of proposed mitigation measures):

- a suitably qualified and experienced heritage advisor would be engaged to provide ongoing heritage and conservation advice throughout the detailed design phase of the Proposal to ensure that the final design adheres to the design recommendations made in the Banksia Station Upgrade Statement of Heritage Impact
- detailed design of the modifications proposed to the Platform 2/3 building and particularly the modifications proposed to the women's waiting room and bathroom would aim to retain and/or reuse original/early fabric including, but not limited to, cornices, joinery and ceiling roses
- detailed design of the proposed modifications to the Platform 2/3 northern waiting room and Platform 4 waiting room would investigate the opportunity to alter the existing (original) seating in these rooms to include compliant armrests
- detailed design of the lift proposed between the underpass and Platform 2/3 would retain as much of the original fabric of the underpass lantern as possible
- the existing building fabric in the Platform 4 waiting room including the stone threshold, timber framing, timber floor, seating, architraves and timber bench seating would be retained and reinstated as part of the proposed lowering of the floor in this building
- no ceilings would be removed as part of the Proposal except those of the underpass lantern and the booking office within the underpass
- detailed design of the Proposal would investigate opportunities to remove existing intrusive fabric that overlies heritage elements (such as the current halogen lighting over ceiling plasterwork) in favour of more sympathetic fittings

- detailed design of the interfaces and setbacks of the new platform canopies would aim to maximise visibility of the Platform 2/3 building and Platform 4 waiting room
- detailed design of the columns for the new platform canopies would aim to minimise their visual impact by investigating reducing the width of the columns and concealing the column footings below the wearing surface of the platform
- platform regrading work would not obscure or obstruct original fabric on the platform buildings such as ventilation grates
- detailed design of the Proposal would minimise indirect (visual) impacts to the Banksia Station heritage item by selecting sympathetic materials and finishes
- detailed design of the Proposal would include interpretation of the existing booking office, and station generally, to achieve a minimum score of 100 in accordance with the *Heritage Interpretation Guidelines* (Sydney Trains Environment Division, 2019)
- detailed design of all work that would significantly alter the layout of an internal spaces would interpret the original/early layout to retain evidence of original configurations such as nib walls and material changes
- detailed design of the proposed modifications to the existing heritage storeroom in the Platform 2/3 building would investigate opportunities for conservation
- a description of the Proposal would be submitted to Sydney Trains at least 28 days prior to the commencement of construction work as part of a notification of intent to demolish under section 170A of the *Heritage Act 1977* for their landowner consent. This notice would also be submitted to the (Heritage NSW at least 14 days prior to the commencement of construction
- all ancillary work would be carried out in accordance with the relevant Sydney Trains heritage guidelines and would avoid fixing new services to the facade of the existing platform buildings and would contain/conceal new services in new structures
- a services plan would be prepared for the Proposal and would be reviewed, assessed and endorsed by a suitably qualified heritage advisor prior to implementation
- White loop-topped fencing must not be used as balustrade in the new entrance structures on the street sides as the material does not meet the design standard required. Opportunities to replace the existing white loop-topped fencing near the station entrances should be investigated and be replaced with fencing that is more sympathetic to the Banksia Station heritage item
- prior to the commencement of construction work, during the work and at the
 completion of the work, a photographic archival recording of the areas of the Banksia
 Station heritage item that are affected by the Proposal would be prepared in
 accordance with *Photographic Recording of Heritage Items using Film or Digital*Capture (NSW Heritage Office, 2006) and *How to Prepare Archival Records of*Heritage Items (NSW Heritage Office, 1998)
- a digital copy of the archival record would be provided to Sydney Trains and Rockdale local library
- In the event that any unanticipated archaeological deposits are identified within the Proposal site during construction, the procedures contained in Transport for NSW's Unexpected Heritage Finds Guideline (Transport for NSW, 2019c) would be followed, and work within the vicinity of the find would cease immediately
- a heritage induction would be provided to workers prior to construction, informing them of the Banksia Station heritage item and guidelines to follow if unexpected heritage items or deposits are uncovered during the construction work.

6.5 Socio-economic impacts

6.5.1 Existing environment

The study area is located within Bayside LGA, which covers an area of about 4,993 hectares. As discussed in Chapter 4, the Proposal would primarily be located within the existing rail corridor. Land use surrounding the Proposal comprises commercial businesses and residential receivers. The closest receivers are about 20 metres from the proposed work, on Railway Street.

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

- surrounding residential receivers (local residents, particularly on Railway Street and Hattersley Street)
- surrounding businesses and commercial receivers including Banksia Hotel (about 80 metres east) and Rocksia Hotel (about 100 metres north)
- St Savvas of Kalymnos Orthodox Church and Community (about 80 metres east)
- Bambino's Kindergarten Banksia (about 190 metres east)
- Pineapple Club Family Day Care (about 300 metres east).

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

- commuters including train passengers using Banksia Station
- local residents, particularly on Railway Street, Hattersley Street and Bowmer Street.

A review of the 2016 Australian Bureau of Statistics Census data was undertaken for Banksia. The suburb of Banksia has a population of about 3,300 people with a median age of 38 years. Of this population, about 94 per cent were identified as being employed and about 23 per cent travelled to work via train, which was the second most common mode of travel to work (Australian Bureau of Statistics, 2020).

6.5.2 Potential impacts

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 loss of parking on Railway Street, Hattersley Street and Taylor Avenue due to the proposed site compound and materials storage and laydown areas
- temporary closures of Banksia Station to accommodate construction work (as part of scheduled rail possessions)
- temporary disruptions to station facilities and amenities (e.g. seating, toilets, pay telephone)
- temporary impacts to local traffic movements due to an increase in truck movements in the area, delivering site materials, plant and equipment
- construction noise, dust and visual impacts.

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

Construction work would be 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. The underpass would be closed during scheduled rail possessions. Pedestrians and cyclists would be diverted to Taylor Avenue, onto the Princes Highway, Subway Road and Railway Street to access the bus replacements during scheduled closures and rail possessions.

No direct impacts to social infrastructure are anticipated as work would be predominantly carried out inside the rail corridor.

If unmanaged, the local amenity of the study area may be impacted by increased noise, traffic, dust and vibration from construction activities. Impacts of the Proposal on traffic and transport, noise and vibration, and air quality, and proposed mitigation to manage these impacts, are discussed in Section 6.1, Section 6.3 and Section 6.10 respectively.

Operation phase

The Proposal would result in a permanent loss of up to five unmarked two-hour parking spaces on Hattersley Street and about two unmarked one-hour parking spaces on Railway Street. This would inconvenience local residents and visitors to Banksia local centre who may need to park further from their intended destination.

The other potential impacts of the Proposal on the community are expected to be positive, including:

- improved accessibility for customers at Banksia Station providing an accessible route to station platforms through the provision of upgraded footpaths, new lifts, regraded platform surface and one new accessible parking space
- improved customer amenity and facilities at the station including a new family accessible toilet and unisex ambulant toilet, adjusted pay telephone, new platformlevel weather protection linking the lift to the existing canopy, new TGSIs and wayfinding signage
- improved weather protection along the platforms, which would encourage customers to spread evenly along the platform thereby reducing train dwell times and improving timetable reliability
- improved transport interchange facilities including new formalised kiss and ride spaces
- more reliable pedestrian access across the rail corridor at Banksia Station following flood events due to the proposed stormwater drainage improvements in the underpass
- potential increased use of public transport to and from Banksia
- additional lighting and CCTV would provide positive Crime Prevention Through Environmental Design outcomes for the area.

6.5.3 Mitigation measures

The following mitigation measures are proposed to manage the potential socio-economic impacts of the Proposal (refer to Table 7-1 for a full list of proposed mitigation measures):

- 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
- feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable

- a Community Liaison Management Plan would be prepared prior to construction to identify all potential stakeholders and best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where practicable
- contact details for a 24-hour construction response line, Project Infoline and email address would be provided for ongoing stakeholder contact throughout the construction phase
- the community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Management Plan to be developed prior to construction.

6.6 Aboriginal heritage

6.6.1 Existing environment

A search for known Aboriginal heritage items in the vicinity of Banksia Station (plus a 200 metre buffer) was carried out on 18 March 2020 using the Aboriginal Heritage Information Management System database maintained by the Environment, Energy and Science Group of the Department of Planning, Industry and Environment. The search confirmed there to be no known Aboriginal heritage items within or close to Banksia Station.

The extensive landscape modification that has occurred across the Proposal study area 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.

6.6.2 Potential impacts

Construction phase

Construction of the Proposal would involve some minor excavation and other ground disturbance activities, particularly for the foundations and pits for each of the new lifts. Ground disturbing activities have the potential to impact Aboriginal sites, if present. However, as no known Aboriginal heritage items are located near to the Proposal and no significant excavations are proposed, no impacts to Aboriginal heritage are expected due to construction of the Proposal.

Operation phase

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

6.6.3 Mitigation measures

The following mitigation measures are proposed to manage the potential impacts of the Proposal on Aboriginal heritage (refer to Table 7-1 for a full list of proposed mitigation measures):

- 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
- if unforeseen Aboriginal objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport

for NSW, 2019c) would be followed, and work within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager, so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the Environment, Energy and Science Group of the Department of Planning, Industry and Environment and the Local Aboriginal Land Council

 if human remains are found, work would cease, the site secured and the NSW Police and the Environment, Energy and Science Group of the Department of Planning, Industry and Environment notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to work recommencing at the location.

6.7 Biodiversity

6.7.1 Existing environment

Vegetation communities

A review of the Native Vegetation of the Sydney Metropolitan Area mapping maintained by the Environment, Energy and Science Group of the Department of Planning, Industry and Environment identified that the vegetation communities in the study area comprise urban exotic and native vegetation.

The Proposal site is located within a disturbed area as a result of previous development and current rail operations. Vegetation in the Proposal site is generally restricted to urban exotic or native vegetation in the form of planted street trees and shrubs along the edges of the rail corridor. There are two garden beds at the southern end of Platform 2/3 that each contain a small tree. A garden bed along the rear of Platform 1 south of the waiting room and store room is sparsely planted with a few *Callistemon* species. A steep garden bed along the rear of Platform 3 south of the waiting room comprises dense plantings of *Lomandra longifolia*.

Adjacent to the rail corridor at the station there is a row of large Camphor Laurel (*Cinnamomum camphora*) trees along the eastern side of Railway Street, from south of the intersection of Railway Street and Bowmer Street and ending just north of the intersection of Railway Street and Kimpton Street. South of the Platform 4 waiting room building there are a mix of large Brush Box (*Lophostemon confertus*) and Camphor Laurel (*Cinnamomum camphora*) trees along the inside boundary of the rail corridor and the western side of Hattersley Street, ending at the southern end of Hattersley Street. Brush Box is endemic to coastal areas of Queensland and extending south to coastal central NSW. It is commonly used as a street tree in Sydney. Camphor Laurel is an exotic tree species.

Threatened flora and fauna

A search of the Bionet Atlas of NSW Wildlife maintained by the Environment, Energy and Science Group of the Department of Planning, Industry and Environment identified one species, the Powerful Owl (*Ninox strenua*), as being potentially identified within 200 metres of the Proposal site. No other threatened species are identified as occurring within 200 metres of the Proposal site.

A search of the Protected Matters Search Tool maintained by the Commonwealth Department of Agriculture, Water for matters of national environmental significance protected under the EPBC Act identified one wetland of international importance (Towra Point Nature Reserve, located about 6.5 kilometres to the south), three threatened ecological communities, 35 listed threatened species, 18 listed migratory species, and 25 listed marine species within one kilometre of the Proposal site.

Fauna habitat

The Proposal site contains minimal fauna habitat as it is predominantly an operational rail corridor. There are fragmented patches of foraging and shelter habitat for fauna in the urban exotic or native tree plantings and shrubs around some edges of the rail corridor.

6.7.2 Potential impacts

Construction phase

The Proposal would require the removal of one large Brush Box (*Lophostemon confertus*) tree at the entrance to the station on Hattersley Street. This tree is planted and its loss would not impact local biodiversity. The visual impact of the removal of this tree is discussed in Section 6.2.2.

The Proposal would also require trimming of another large Brush Box (*Lophostemon confertus*) near to the new transformer proposed near to Fortescue Reserve. The Proposal site is located within disturbed cleared areas within the rail corridor and surrounding developed areas. The Proposal site does not contain any threatened ecological communities, populations or species. The vegetation that exists along the edges of the rail corridor is unlikely to provide suitable fauna habitat. Therefore, no significant ecological impact is anticipated as a result of the Proposal.

Weeds may be present in proximity to the Proposal site and have the potential to spread due to the movement of construction plant and equipment across the Proposal site.

The Proposal is located within a significantly developed area within the suburb of Banksia and as such has been subject to significant historical development. Beyond a number of street trees in the Proposal site, it is considered unlikely that any significant habitat for threatened species or endangered ecological communities exist within the Proposal site.

Operation phase

There would be no impacts on biodiversity during operation of the Proposal.

6.7.3 Mitigation measures

The following mitigation measures are proposed to manage the potential impacts of the Proposal on biodiversity (refer to Table 7-1 for a full list of proposed mitigation measures):

- construction of the Proposal would be carried out in accordance with the Vegetation Management (Protection and Removal) Guideline (Transport for NSW, 2019d) and Transport for NSW's Fauna Management Guideline (Transport for NSW, 2019e)
- all workers would be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity
- disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal
- in the event of any tree to be retained becoming damaged during construction, the Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible
- should the detailed design or onsite work determine the need to remove or trim any additional trees, which have not been identified in the REF, the Construction

Contractor would be required to complete Transport for NSW's Tree Removal Application Form and submit it to Transport for NSW for approval

 weed control measures, consistent with Transport for NSW's Weed Management and Disposal Guide (Transport for NSW, 2019f), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the Biosecurity Act 2015.

6.8 Contamination, geology and soils

Potential impacts on contamination, landform, geology and soils are presented in this section, together with mitigation measures to manage any negative impacts.

6.8.1 Existing environment

Geology

The Geological map of Sydney 1:100,000 indicates that the proposal is underlain by the Hawkesbury Sandstone.

The Hawkesbury Sandstone is generally medium to coarse grained quartz sandstone with minor shale and laminate lenses.

Soils

The Soil Landscape of the Sydney 1:100,000 Map indicates that Banksia Station is underlain by Newport soil landscape lines.

The soils in the rail corridor are highly disturbed and common characteristics include unconsolidated low wet strength, impermeable soils, poor drainage, localised very low fertility and toxic materials.

Acid sulfate soils

Acid sulfate soils are soils and sediments containing iron sulfides that, when exposed to oxygen, generate sulfuric acid and potentially toxic quantities of aluminium and other heavy metals. The sulfuric acid and heavy metals are produced in forms that can be readily released and absorbed into the environment, with potential adverse effects on the natural and built environment and human health.

The Proposal site has been identified as containing Class 5 acid sulfate soils, indicating that although acid sulfate soils are not likely present, areas rated 1, 2, 3, or 4, where acid sulfate soils are likely to occur, are within 500 metres of the Proposal site.

Contamination

A search of the NSW EPA contaminated land records of notices and NSW contaminated sites notified to the EPA in March 2020 did not identify any records of contamination in the study area.

Railway corridors have the potential to contain various contaminated materials from historical and operational sources. Such sources relate to the long-term operation of the railway and the history of nearby contaminating activities. Possible sources of contamination may include fill materials, hazardous materials from structures, leaks and spills of fuels or chlorinated, historical use of pesticides, and asbestos dust from train brake pads. Standards Australia (2005) states that common non-volatiles and semivolatiles in railway yards include hydrocarbons, arsenic, phenolics (creosote), heavy metals, nitrates and ammonia.

6.8.2 Potential impacts

Construction phase

The proposal would require excavation work for the installation of the lift foundations and pits. Excavation work would also be required for piling work for canopy footings and removal and installation of station infrastructure. This work would be contained on the existing station platforms and would therefore reduce the risk of soil disturbance.

There is the potential for erosion and sedimentation, and sediment may leave the Proposal site through vehicle tracking if not managed correctly. There is the potential for unexpected finds which would require management if contaminated soils are encountered.

There is potential risk for accidental spills at the construction compounds from the storage of fuels, oils and other potentially harmful substances. The impact of accidental spills or leaks of these substances is anticipated to be low as the Proposal would not involve the storage of large quantities of fuels, oils or other potentially harmful substances on site.

Operation phase

During operation, run off and drainage from the canopies would be captured via an existing drainage system and discharged to manage operational risks to soil. The operation of the proposal is not expected to result in impacts on contamination, landform, geology and soils.

6.8.3 Mitigation measures

The following mitigation measures are proposed to manage the potential impacts of the Proposal on soils (refer to Table 7-1 for a full list of proposed mitigation measures):

- prior to commencement of work, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of work and maintained throughout construction.
- erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the work is complete and areas are stabilised.
- 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.
- 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 carried out in accordance with SafeWork NSW requirements.
- all waste would be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (EPA, 2014)* prior to disposal.

6.9 Hydrology and water quality

Potential impacts on hydrology and water quality are presented in this section, together with mitigation measures to manage any potential impacts.

6.9.1 Existing environment

Hydrology

The proposal is located within the flood planning area as identified in the Rockdale LEP 2011 and is susceptible to localised flooding.

The pedestrian underpass currently floods during heavy rain events due to water ingress from the track drainage above the underpass. Water enters the underpass through the ceiling and walls. As the underpass is a low point in the catchment and drainage network, the water needs to be pumped out of the underpass. A small pit and sump already exist in the underpass but are not adequate to keep up with ingress through the walls and entrance catchment, resulting in water pooling in the underpass. This 'nuisance flooding' is different to a catchment flood event where Railway Street is also inundated by water.

BMT WBM (2019) completed a flood study of the Spring Street Drain Catchment including Banksia Station for Bayside Council to define the existing flood behaviour in the catchment and establish the basis for subsequent floodplain management activities. A copy of the flood model used in that study has been used by Transport for NSW to assess the likely flood immunity of the underpass. Initial flood modelling shows the areas surrounding Banksia Station are flood affected zones for both minor and major storm events. Both minor and major storm events show that once Railway Street kerb and pedestrian path levels are topped by flood water the water begins spilling into the underpass. The magnitude of water during a flood event is in the order of tonnes per second. This is different from the nuisance flooding of the underpass described above which are low levels of inundation that do not pose significant threats to public safety or cause major property damage but can disrupt routine day-to-day activities.

Surface water

There is one unnamed creek located about 300 metres east of the proposed work at Banksia Station. The unnamed creek is a tributary of Muddy Creek located over 1.5 kilometres east of the Proposal site at Banksia 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 at the Proposal site is unknown. A search of the WaterNSW groundwater database indicates that there are no registered groundwater bores within 500 metres of the Proposal site.

6.9.2 Potential impacts

Construction phase

Flooding of the underpass is a risk that would need to be managed during the construction phase of the Proposal. If a local flood were to occur during construction in the underpass, there is potential for this work site to be inundated, which could cause damage to plant and equipment and pollution of the floodwater with construction materials, chemicals and sediment.

The Construction Contractor would need to stage and plan the construction work in the underpass for a potential flood event so as to minimise the potential for floodwater to cause damage to partially-built new infrastructure and plant and equipment or pollution of the floodwater.

Elsewhere, there is potential for water quality in nearby watercourses to be impacted through pollution of stormwater runoff from construction work sites on the platforms, Railway Street and Hattersley Street and at the construction site compound and material storage and laydown

areas with fuels, other hazardous materials stored on site and sediment. These impacts would be adequately managed with standard environmental management measures. These measures would be consistent with the principles and practices detailed in *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004).

Operation phase

The Proposal involves drainage work within the underpass including waterproofing, regrading of the underpass floor, installation of a grated trench drain and an upgrade of the existing sump and pump system in the underpass. The new pump system would discharge collected water from the underpass to a new pit and pipe on Hattersley Street, connecting to the existing Council drainage network. The new pump system would comprise a dual-pump arrangement with a back-up power supply, to ensure its continued operation in the event of a mechanical or power failure. It is anticipated these measures would mitigate the nuisance flooding that currently occurs in the underpass during heavy rain events.

The flood modelling completed by Transport for NSW indicates that no flood event can practically be designed to enable the underpass to remain open during a flood event due to the inundation of the underpass by floodwaters entering the underpass from Railway Street. In such flood events, the use of drainage pumps within the underpass would not be feasible as any water pumped out simply be replaced by further inflow from Railway Street. During such flood events, the station would need to close.

6.9.3 Mitigation measures

The following mitigation measures are proposed to manage the potential impacts of the Proposal on hydrology and water quality (refer to Table 7-1 for a full list of proposed mitigation measures):

- no stockpiles of material or storage of fuels or chemicals would be located within high/medium flood risk areas or adjacent to existing waterways
- all fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and Transport for NSW's Chemical Storage and Spill Response Guidelines (Transport for NSW, 2019g)
- adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the Transport for NSW Chemical Storage and Spill Response Guidelines (Transport for NSW, 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
- in the event of a pollution incident, work would cease in the immediate vicinity and the Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the Protection of the Environment Operations Act 1997
- the existing drainage systems would remain operational throughout the construction phase.

6.10 Air quality

6.10.1 Existing environment

Air quality in the study area is representative of an urban area and is mainly dominated by vehicle emissions.

A search of the National Pollutant Inventory maintained by the Commonwealth Department of Agriculture, Water and the Environment was conducted for the study area on 24 March 2020. The search did not identify any pollutant emitting facilities within 500 metres of the study area.

No air quality monitoring was carried out specifically for the Proposal. The Environment, Energy and Science Group of the Department of Planning, Industry and Environment operates a nearby ambient air quality monitoring station at Earlwood and is the closest station to the Proposal. The Earlwood air quality monitoring station records nitrogen dioxide (NO₂), ozone (O₃), PM₁₀, PM_{2.5} and visibility. Data collected for the period 2018-2019 showed that the 24-hour average criterion for PM₁₀ was exceeded once in July 2018 and twice in November 2018, the 24-hour average criterion for PM_{2.5} was exceeded once in May 2018 and once in April 2019, and the one-hour average criterion for visibility was exceeded nine times during May 2018, four times during August 2018 and five times in April 2019.

6.10.2 Potential impacts

Construction phase

During construction, air quality impacts would largely result from dust generated during excavation of the station platforms, stockpiling of excavated material and the movement of construction vehicles, plant and equipment along unsealed surfaces. Vehicles emissions would also be generated from the use of construction vehicles, plant and equipment.

Given that the Proposal is not likely to expose large areas of soil and that air quality impacts can be managed through the implementation of standard management measures, impacts on air quality are expected to be temporary and minor.

Operation phase

There would be no impacts on air quality during operation of the Proposal.

6.10.3 Mitigation measures

The following mitigation measures are proposed to manage the potential impacts of the Proposal on air quality (refer to Table 7-1 for a full list of proposed mitigation measures):

- air quality management and monitoring for the Proposal would be carried out in accordance with Transport for NSW's Air Quality Management Guideline (Transport for NSW, 2019h)
- methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks
- 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
- vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable
- to minimise the generation of dust from construction activities, the following measures would be implemented:

- o apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces)
- o 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
- o prevent mud and dirt being tracked onto sealed road surfaces.

6.11 Waste and resources

6.11.1 Exiting environment

Banksia Station generates minimal waste. Waste sources are limited to roadside litter, litter from train users and bins provided on the platforms, some waste material from clearing drainage features and green waste from the maintenance of vegetation.

6.11.2 Potential impacts

Construction phase

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

- asphalt and concrete
- spoil from earthwork
- building material wastes (including metals, timbers, plastics, concrete and carpeting)
- packaging materials from items delivered to site, such as pallets, crates, cartons, plastics and wrapping materials
- electrical wiring and conduit waste (from electrical connections)
- fuels, liquids and chemicals
- green waste (including weeds)
- demolition waste from the existing footpaths, and from the internal walls of the toilets, including potential asbestos and hazardous materials
- oil, grease and other liquid wastes from the maintenance of construction plant and equipment
- 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*. 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 and would include reuse and recycling.

The quantity of waste generated by the Proposal would be comparable to similar infrastructure projects and would be adequately managed with standard waste management measures, to be developed as part of the CEMP.

Operation phase

Operation of the Proposal would not increase the amount or change the type of waste generated within the Proposal site.

6.11.3 Mitigation measures

The following mitigation measures are proposed with respect to potential waste impacts (refer to Table 7-1 for a full list of proposed mitigation measures):

- the CEMP (or separate Waste Management Plan, if necessary) would address waste management and would at a minimum:
 - identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities
 - o detail other onsite management practices such as keeping areas free of rubbish
 - specify controls and containment procedures for hazardous waste and asbestos waste
 - o outline the reporting regime for collating construction waste data.

6.12 Sustainability

The design of the Proposal would be based on the principles of sustainability, including the incorporation of ISCA 1.2 and the Transport for NSW Environmental Management System. Refer to Section 3.3.3 for more information regarding the application of the IS rating tool.

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

6.13 Climate change

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

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

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

A Climate Risk Assessment has been carried out for the project. The risk assessment identified nine climate risk statements responding to each of the climate variables identified for the proposal. No High or Very High risks were identified. The Climate Risk Assessment would be updated at the System Definition Review and Critical Design Review stages to fully inform the design.

6.14 Greenhouse gas emissions

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

Transport for NSW requires that a baseline greenhouse gas emissions footprint is calculated for its projects using the Carbon Estimate and Reporting Tool. The Construction Contractor is then required to demonstrate a reduction in construction-related greenhouse gas emissions of at least five per cent from the established project baseline.

Due to the small scale of the Proposal and the temporary nature of the 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 Banksia. A modal shift in transport usage may reduce the amount of fuel consumed by private motor vehicles with a corresponding relative reduction in associated greenhouse gas emissions in the local area.

6.15 Cumulative impacts

Cumulative impacts occur when two or more projects are carried out concurrently and in 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 carried out in isolation. Multiple projects carried out at a similar time/similar location may also lead to construction fatigue, particularly around noise, traffic and air quality impacts, if not appropriately managed.

6.15.1 Existing and future projects in the area

A search of the Department of Planning, Industry and Environment's Major Projects Register and Bayside Council's Development Application Register in March 2020 identified one major project, the WestConnex project, in the vicinity of the Proposal. However, the WestConnex project in the vicinity of the Proposal would comprise a road tunnel with entry and exit ramps at considerable distance from Banksia and, therefore, there would be negligible potential for cumulative impacts with this project.

The current More Trains, More Services Program of work includes upgrades at various locations on the T4 Illawarra Line and T8 Airport Line ranging from power supply upgrades to signalling system upgrades and station capacity increases. While the construction of some of this work may overlap with the timing of the construction of the Proposal, none of them are near to the Proposal.

6.15.2 Mitigation measures

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

- consultation and liaison would occur with Bayside Council and Sydney Trains to identify and minimise potential cumulative construction impacts such as traffic and noise
- the potential cumulative impacts of the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential surrounding developments is released.

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 Transport for NSW environmental management system. The CEMP would provide a centralised mechanism through which all potential environmental impacts relevant to the Proposal would be managed and outline a framework of procedures and controls for managing environmental impacts during construction.

The CEMP would incorporate but not be limited to the following key sub plans:

- Construction Traffic Management Plan
- Construction Noise and Vibration Management Plan
- Erosion and Sediment Control Plan
- Waste Management Plan.

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
	General
1.	A CEMP would be prepared by the Construction Contractor in accordance with the relevant requirements of <i>Guideline for Preparation of Environmental Management Plans</i> (Department of Infrastructure, Planning and Natural Resources, 2004) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the Construction Contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An Environmental Controls Map would be developed by the Construction Contractor in accordance with Transport for NSW's <i>Guide to Environmental Controls Map</i> (Transport for NSW, 9i) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.

No. Mitigation measure

- 6. Service relocation would be undertaken in consultation with the relevant authority.

 Contractors would mark existing services on the Environmental Controls Map to avoid direct impacts during construction.
- 7. Any modifications to the Proposal, if approved, would be subject to further assessment and approval by Transport for NSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.

Traffic and transport

- **8.** Prior to the commencement of construction, a Construction Traffic Management Plan would be prepared as part of the CEMP and would include at a minimum:
 - ensuring adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised
 - maximising safety and accessibility for pedestrians and cyclists
 - ensuring adequate sight lines to allow for safe entry and exit from the site
 - ensuring access to Banksia Station, Banksia local centre, Fortescue Reserve and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made)
 - managing impacts and changes to on and off-street parking and requirements for any temporary replacement provision
 - ensuring parking locations for construction workers away from Banksia Station and Banksia local centre and details of how this will be monitored for compliance
 - designating routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses
 - details for temporarily relocating the taxi rank and bus stop on Railway Street if required, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired
 - measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the Construction Traffic Management Plan.

Consultation with Bayside Council would be undertaken during preparation of the Construction Traffic Management Plan. The performance of all project traffic arrangements would be monitored during construction.

- 9. Communication would be provided to the community and local residents via notifications and signage to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work.
- 10. Road occupancy licences for temporary road closures would be obtained, where required.
- 11. Qualified traffic controllers would be used during construction work to ensure safe and efficient movement of vehicle and pedestrian traffic around the work site as well as in and out of construction compounds and laydown areas and in and out of the rail corridor.
- **12.** Fencing and barriers would be installed between the construction site and outside the construction zone to ensure safe and easy navigation of pedestrians and cyclists.
- 13. All work with the potential to impact pedestrian movements such a lifting should be carried out during scheduled weekend rail possessions.

14. Transport for NSW would work with Bayside Council to investigate potential locations where new parking spaces could be created to offset the permanent loss of seven parking spaces at Banksia Station. These investigations would focus on Hattersley Street and nearby areas.

Landscape and visual amenity

- **15.** Detailed design of the Proposal would consider the following mitigation measures to reduce the visual impact and create a development that is in keeping with the character of Banksia Station. These measures include:
 - Materials should be selected to be consistent with existing elements found within the station. A colour palette that is complementary to the heritage character of Banksia Station should be selected.
 - Where possible, the design should reduce the bulk and dominance of the lift structures from the public domain.
 - Consideration should be given to the inclusion of additional landscaping to offset the removal of the street tree in Hattersley Street and also assist to filtering views to the elevated lift structures.
- 16. All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to AS 1158 Lighting for Roads and Public Spaces and AS 4282 Control of the Obtrusive Effects of Outdoor Lighting. An appropriate lighting management plan should be prepared to minimise the impact of lighting into adjacent visually sensitive properties and would include downward direct lights, baffling and shielding.
- 17. Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
- **18.** Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
- **19.** During construction, graffiti would be removed in accordance with Transport for NSW's standard requirements.
- **20.** The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.
- **21.** Temporary access arrangements should be well signed and provide a visually legible route for pedestrians.
- 22. Site equipment and facilities should be consolidated to maximise the area of useable public realm and maintain pedestrian permeability.
- 23. A colour palette that is complementary to the heritage character of Banksia Station should be selected.
- 24. Light spill from the construction area into adjacent visually sensitive properties would be minimised by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.

Noise and vibration

- 25. Prior to commencement of work, a Construction Noise and Vibration Management Plan would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009) and the *Construction Noise and Vibration Strategy* (Transport for NSW, 2019b). The Construction Noise and Vibration Management Plan would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
- 26. The Construction Noise and Vibration Management Plan would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered include:
 - regularly training workers and contractors (such as at the site induction and toolbox talks)
 on the importance of minimising noise emissions and how to use equipment in ways to
 minimise noise
 - avoiding any unnecessary noise when carrying out manual operations and when operating plant
 - ensuring spoil is placed and not dropped into awaiting trucks
 - avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable
 - switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off while being unloaded
 - avoiding deliveries at night/evenings wherever practicable
 - no idling of delivery trucks
 - keeping truck drivers informed of designated heavy 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.
- 27. The Construction Noise and Vibration Management Plan would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered include:
 - maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances
 - using the most suitable equipment necessary for the construction work at any one time
 - directing noise-emitting plant away from sensitive receivers
 - regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc
 - using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours work
 - using quieter and less vibration emitting construction methods where feasible and reasonable.
- 28. Work would generally be carried out during standard construction hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays). Any work outside these hours may be undertaken if approved by Transport for NSW and the community is notified prior to this work commencing. An Out of Hours Work application form would need to be prepared by the Construction Contractor and submitted to the Transport for NSW Environment and Planning Manager for any work outside normal hours.

- 29. Where the L_{Aeq (15minute)} construction noise levels are predicted to exceed 75 dBA and/or 30 dBA above the rating background level at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with Transport for NSW's *Construction Noise and Vibration Strategy* (Transport for NSW, 2019b). This would include restricting the hours that very noisy activities can occur.
- **30.** Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.
- 31. Vibration resulting from construction and received at any structure outside of the Proposal site 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).
- 32. Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory work including jack hammering and compaction for all buildings/structures/roads with a plan distance of 20 metres from the work and all heritage listed buildings and other sensitive structures within 50 metres of the work (unless otherwise determined following additional assessment they are not likely to be adversely affected).
- 33. To avoid structural impacts as a result of vibration or direct contact with structures, the proposed work would be carried out in accordance with the minimum working distances for vibration intensive plant identified in Table 6-7 and attended vibration monitoring or vibration trials would be carried out where these distances are required to be challenged.
- 34. High noise impact construction activities would be carried out in continuous blocks of up to three hours. Respite from high noise impact activities would be provided between each block for at least one hour. No high noise impact activities would be carried out during this one hour respite period.
- **35.** High noise generating construction plant and equipment would not be used during the night period.
- **36.** Condition surveys of all structures that form part of the Banksia Railway Station Group heritage listing and are not proposed for demolition would be completed prior to the commencement of construction work.
- 37. Site specific minimum working distances for vibration significant plant items would be measured on site where plant and equipment is likely to operate close to or within the recommended minimum working distances for cosmetic damage. Where plant is required to operate within site specific minimum working distances, vibration monitoring is recommended to verify that vibration levels achieve compliance with the structural damage objectives. Where monitoring above identifies that vibration is likely to exceed the structural damage objectives, a different construction method with lower source vibration levels should be considered.
- **38.** Appropriate performance criteria for the public address system along the station platforms would be specified as part of detailed design to ensure compliance with the noise emission requirements at nearby noise sensitive receivers.

Non-Aboriginal heritage

- 39. A suitably qualified and experienced heritage advisor would be engaged to provide ongoing heritage and conservation advice throughout detailed design and any subsequent relevant design modifications. The nominated heritage advisor would provide specialist advice throughout the detailed design phase to ensure that the final design adheres to the design recommendations made in the *Banksia Station Upgrade Statement of Heritage Impact*.
- **40.** Detailed design of the modifications proposed to the Platform 2/3 building and particularly the modifications proposed to the women's waiting room and bathroom would aim to retain and/or reuse original/early fabric including, but not limited to, cornices, joinery and ceiling roses.
- 41. Detailed design of the proposed modifications to the Platform 2/3 northern waiting room and Platform 4 waiting room would investigate the opportunity to alter the existing (original) seating in these rooms to include compliant armrests.
- **42.** Detailed design of the lift proposed between the underpass and Platform 2/3 would retain as much of the original fabric of the underpass lantern as possible.
- 43. The existing building fabric in the Platform 4 waiting room including the stone threshold, timber framing, timber floor, seating, architraves and timber bench seating would be retained and reinstated as part of the proposed lowering of the floor in this building.
- 44. No ceilings would be removed as part of the Proposal except those of the underpass lantern and the booking office within the underpass.
- **45.** Detailed design of the Proposal would investigate opportunities to remove existing intrusive fabric that overlies heritage elements (such as the current halogen lighting over ceiling plasterwork) in favour of more sympathetic fittings.
- **46.** Detailed design of the interfaces and setbacks of the new platform canopies would aim to maximise visibility of the Platform 2/3 building and Platform 4 waiting room.
- 47. Detailed design of the columns for the new platform canopies would aim to minimise their visual impact by investigating reducing the width of the columns and concealing the column footings below the wearing surface of the platform.
- **48.** Platform regrading work would not obscure or obstruct original fabric on the platform buildings such as ventilation grates.
- **49.** Detailed design of the Proposal would minimise indirect (visual) impacts to the Banksia Station heritage item by selecting sympathetic materials and finishes.
- **50.** Detailed design of the Proposal would include interpretation of the existing booking office, and station generally, to achieve a minimum score of 100 in accordance with the *Heritage Interpretation Guidelines* (Sydney Trains Environment Division, 2019).
- **51.** Detailed design of all work that would significantly alter the layout of an internal spaces would interpret the original/early layout to retain evidence of original configurations such as nib walls and material changes.
- **52.** Detailed design of the proposed modifications to the existing heritage storeroom in the Platform 2/3 building would investigate opportunities for conservation.

- 53. A description of the Proposal would be submitted to Sydney Trains at least 28 days prior to the commencement of construction work as part of a notification of intent to demolish under section 170A of the *Heritage Act 1977* for their landowner consent. This notice would also be submitted to Heritage NSW at least 14 days prior to the commencement of construction.
- 54. All ancillary work would be carried out in accordance with the relevant Sydney Trains heritage guidelines and would avoid fixing new services to the facade of the existing platform buildings and would contain/conceal new services in new structures.
- **55.** A services plan would be prepared for the Proposal and would be reviewed, assessed and endorsed by a suitably qualified heritage advisor prior to implementation.
- White loop-topped fencing must not be used as balustrade in the new entrance structures on the street sides as the material does not meet the design standard required. Opportunities to replace the existing white loop-topped fencing near the station entrances should be investigated and be replaced with fencing that is more sympathetic to the Banksia Station heritage item.
- 57. Prior to the commencement of construction work, during the work and at the completion of the work, a photographic archival recording of the areas of the Banksia Station heritage item that are affected by the Proposal would be prepared in accordance with *Photographic Recording of Heritage Items using Film or Digital Capture* (NSW Heritage Office, 2006) and *How to Prepare Archival Records of Heritage Items* (NSW Heritage Office, 1998). A digital copy of the archival record would be provided to Sydney Trains and Rockdale local library.
- 58. In the event that any unanticipated archaeological deposits are identified within the Proposal site during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019c) would be followed, and work within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and the Heritage NSW. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to work recommencing at the location.
- 59. A heritage induction would be provided to workers prior to construction, informing them of the Banksia Station heritage item and guidelines to follow if unexpected heritage items or deposits are uncovered during the construction work.

Socio-economic

- 60. 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.
- **61.** Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
- 62. 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.
- **63.** 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.

64. 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.

Aboriginal heritage

- 65. 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.
- 66. If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in Transport for NSW's Unexpected Heritage Finds Guideline (Transport for NSW, 2019c) would be followed, and work within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in coordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the Environment, Energy and Science Group of the Department of Planning, Industry and Environment and the Local Aboriginal Land Council.
- 67. If human remains are found, work would cease, the site secured and the NSW Police and the Environment, Energy and Science Group of the Department of Planning, Industry and Environment notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to work recommencing at the location.

Biodiversity

- 68. Construction of the Proposal would be undertaken in accordance with Transport for NSW's Vegetation Management (Protection and Removal) Guideline (Transport for NSW, 2019d) and Transport for NSW's Fauna Management Guideline (Transport for NSW, 2019e).
- 69. 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.
- 70. Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees/vegetation nominated to be removed in Section 6.7.2 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.
- **71.** Tree protection zones would be established around trees to be retained. Tree protection would be undertaken in line with AS 4970-2009 *Protection of Trees on Development Sites* and would include exclusion fencing of tree protection zones.
- 72. In the event of any tree to be retained becoming damaged during construction, the Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
- 73. Should the detailed design or onsite work determine the need to remove or trim any additional trees, which have not been identified in the REF, the Construction Contractor would be required to complete Transport for NSW's Tree Removal Application Form and submit it to Transport for NSW for approval.

74. Weed control measures, consistent with Transport for NSW's *Weed Management and Disposal Guideline* (Transport for NSW, 2019f), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the *Biosecurity Act 2015*.

Soil and water

- 75. 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.
- 76. Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the work is complete and areas are stabilised.
- 77. 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.
- 78. All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA guidelines and Transport for NSW's *Chemical Storage and Spill Response Guidelines* (Transport for NSW, 2019g).
- 79. Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the Transport for NSW *Chemical Storage and Spill Response Guidelines* (Transport for NSW, 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.
- 80. In the event of a pollution incident, work would cease in the immediate vicinity and the Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the *Protection of the Environment Operations Act 1997*.
- **81.** The existing drainage systems would remain operational throughout the construction phase.
- 82. Should groundwater be encountered during excavation work, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and Transport for NSW's *Water Discharge and Reuse Guideline* (Transport for NSW, 2019j).
- 83. 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 carried out in accordance with SafeWork NSW requirements.
- 84. All waste would be classified in accordance with the *Waste Classification Guidelines Part 1:*Classifying waste (EPA, 2014) prior to disposal

85. No stockpiles of material or storage of fuels or chemicals would be located within high/medium flood risk areas or adjacent to existing waterways.

Air quality

- **86.** Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's *Air Quality Management Guideline* (Transport for NSW, 2019h).
- **87.** Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
- 88. 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.
- **89.** Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
- **90.** To minimise the generation of dust from construction activities, the following measures would be implemented:
 - apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces)
 - cover stockpiles when not in use
 - appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading
 - prevent mud and dirt being tracked onto sealed road surfaces.

Waste and contamination

- **91.** A Waste Management Plan is to be prepared as part of the CEMP to address waste management and would at a minimum:
 - identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities
 - detail other onsite management practices such as keeping areas free of rubbish
 - specify controls and containment procedures for hazardous waste and asbestos waste
 - outline the reporting regime for collating construction waste data.
- 92. An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with WorkCover requirements.
- **93.** 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.
- **94.** All spoil and waste would be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste* (EPA, 2014) prior to disposal.
- **95.** Any concrete washout would be established and maintained in accordance with Transport for NSW's *Concrete Washout Guideline* (Transport for NSW, 2019k) with details included in the CEMP and location marked on the Environmental Controls Map.

No. Mitigation measure Sustainability, climate change and greenhouse gases Detailed design and construction of the Proposal is to be undertaken in accordance with the 96. ISCA Infrastructure Sustainability Rating Scheme (v1.2) 97. Review and update the climate change risk assessment during detailed design as required. Cumulative 98. Consultation and liaison would occur with Bayside Council and Sydney Trains to identify and minimise potential cumulative construction impacts such as traffic and noise. 99. The potential cumulative impacts of the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential surrounding developments is released.

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 on Platform 2/3 to meet the needs of a growing population
- canopies along Platforms 2/3 and 4 that promote the use of the length of these
 platforms, thereby reducing train dwell times and improve timetable reliability. The
 canopy on Platform 1 would provide cover at the lift and the boarding assistance
 zone
- improved accessibility of interchange between train and bus services and private vehicles at Banksia Station
- improved drainage infrastructure in the pedestrian underpass to prevent the nuisance flooding that currently occurs during heavy rain events.

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

- demolition of the lantern structure above the underpass at the northern end of Platform 2/3 and the booking office within the underpass, which form part of the heritage listed Banksia Railway Station Group. Other proposed direct impacts to the Banksia Station heritage item include modifications to the Platform 2/3 building, lowering the floor of the Platform 4 waiting room, removing parts of the brick retaining walls along Railway Street and Hattersley Street and regrading some areas on the platforms
- the permanent loss of about two unmarked one-hour parking spaces on Railway Street immediately south of the bus stop, to accommodate footpath widening work
- the permanent loss of up to five unmarked two-hour parking spaces on the eastern side of Hattersley Street, opposite the station entrance, to accommodate an accessible parking space and a kiss and ride space
- changes to views of Banksia Station from publicly accessible viewpoints on Railway Street and Hattersley Street. The new lifts and canopies would be clearly visible from outside of the station and there would be more restricted views of the heritage buildings on the platforms and across the rail corridor
- temporary disruption to station facilities and amenities during construction, including during scheduled Sydney Trains shutdowns
- removal of one tree at the entrance to the station on Hattersley Street to accommodate one of the proposed lifts
- temporary impacts on local traffic flow associated with construction traffic and partial road closures of Railway Street and Hattersley Street
- temporary changes to vehicular, bus, bicycle and pedestrian access around the station during construction
- temporary reduction in parking availability for customers and local residents during construction

- temporary noise impacts to adjacent residential areas during construction, including periods of weekend work
- minor temporary impacts to air quality from excavation work, stockpiling of excavated material and vehicle emissions.

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

The Proposal has also taken into account the principles of ecologically sustainable development (refer to Section 4.3 and Section 6.12). These would be considered further during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal delivers the maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

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Appendix A

Consideration of matters of National Environmental Significance

The table below demonstrates Transport for NSW's consideration of the matters of National Environmental Significance under the EPBC Act to determine whether the Proposal should be referred to the Commonwealth Department of Agriculture, Water and the Environment.

Matters of National Environmental Significance	Impacts
Any impact on a World Heritage property? Comment: There are no World Heritage properties in the vicinity of the Proposal.	Nil
Any impact on a National Heritage place? Comment: There are no National Heritage places near the Proposal site.	Nil
Any impact on a wetland of international importance? Comment: There is one wetland of international importance located about 6.5 kilometres to the south of the Proposal. Due to the geographical distance between the Proposal site and the wetland, it is anticipated that there would be no impacts to the wetland.	Nil
Any impact on a listed threatened species or communities? Comment: The Proposal is unlikely to significantly affect listed threatened species, populations or communities.	Nil
Any impacts on listed migratory species? Comment: The Proposal is unlikely to significantly affect listed migratory species due to the highly urban nature of the site.	Nil
Does the proposal involve a nuclear action (including uranium mining)? Comment: The Proposal does not involve a nuclear action.	Nil
Any impact on a Commonwealth marine area? Comment: The Proposal site is not near a Commonwealth marine area.	Nil
Does the proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? Comment: 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? Comment: The Proposal would not be carried out on or near to Commonwealth land.	Nil

Appendix B Consideration of clause 228

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

Factor	Impacts
(a) Any environmental impact on a community? Comment: The Proposal would have some temporary impacts to the community during construction, particularly in relation to noise, traffic and access and visual amenity. Mitigation measures outlined in Table 7-1 would be implemented to manage and minimise adverse impacts. Operation of the Proposal would result in long-term positive impacts due	Minor
to improved accessibility, amenity, safety and comfort.	
(b) Any transformation of a locality? Comment: The Proposal would involve the introduction of new visible elements in the landscape including three new lifts and platform canopies. However, this new infrastructure would not transform the locality; the appearance of the new elements would be consistent with the existing station elements and are considered to be common features in urban areas. The Proposal would make a positive contribution to the locality by improving the accessibility of local public transport, which would improve	Minor
the liveability of the Banksia area. (c) Any environmental impact on the ecosystem of the locality?	Nil
Comment: With the proposed mitigation conditions in place, the Proposal is unlikely to impact the local ecosystem as confirmed in Chapter 6. The proposed removal of one large Brush Box (<i>Lophostemon confertus</i>) at the Hattersley Street entrance to the station and trimming of another large Brush Box (<i>Lophostemon confertus</i>) near to the new transformer proposed near to Fortescue Reserve would not adversely affect any local ecosystems.	TVII
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?	Minor
Comment: 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.	
(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?	Moderate
Comment: The Proposal would directly impact some of the original fabric of the Banksia Railway Station Group, which has local heritage significance elements. The bulk and scale of the proposed new infrastructure at Banksia Station would adversely affect views to and within the station including views of buildings and structures that form part of the Banksia Railway heritage item.	
The recommendations of the <i>Banksia Station Upgrade Statement of Heritage Impact</i> as summarised in Section 6.4.3 of this REF would be implemented to manage potential impacts.	

Factor	Impacts
(f) Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)? Comment: The Proposal is unlikely to impact on the habitat of any protected fauna.	Nil
protected fauria.	
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? Comment: The Proposal is unlikely to endanger any species of animal,	Nil
plant or other form of life, whether living on land, in water or in the air.	
(h) Any long-term effects on the environment?	Nil
Comment: The Proposal is unlikely to have any long-term effect on the environment with implementation of the management and mitigation measures identified in Table 7-1.	
(i) Any degradation of the quality of the environment?	Nil
Comment: The Proposal is unlikely to result in the degradation of the quality of the environment.	
(j) Any risk to the safety of the environment?	Nil
Comment: Construction of the Proposal would be managed in accordance with a CEMP to reduce any risks to the environment.	
(k) Any reduction in the range of beneficial uses of the environment?	Nil
Comment: The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.	
(I) Any pollution of the environment?	Minor
Comment: During construction, the Proposal has the potential to result in short-term noise, air and water pollution. These impacts would be managed in accordance with the mitigation measures outlined in Table 7-1.	
Operation of the Proposal is unlikely to result in pollution of the environment.	
(m) Any environmental problems associated with the disposal of waste?	Minor
Comment: The Proposal is unlikely to result in any environmental problems associated with the disposal of waste.	
All waste requiring off-site disposal would be classified in accordance with the <i>Waste Classification Guidelines</i> (EPA, 2014) prior to disposal at an appropriate waste facility licenced to accept waste of the relevant classification.	
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?	Nil
Comment: The Proposal would not increase demands on resources (natural or otherwise) that are, or are likely to become, in short supply.	
(o) Any cumulative environmental effect with other existing or likely future activities?	Nil
Comment: The potential cumulative effects of the Proposal are described in Section 6.15. Where feasible, environmental management measures would be co-ordinated to reduce any potential cumulative construction impacts.	
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Factor	Impacts
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?	Nil
Comment: The Proposal is not located on the coastline and has not been identified as within an area that would be subject to a rise in the sea level.	