Transport for NSW

Bardwell Park Station Upgrade

Review of Environmental Factors

Objective Reference A65500622

August 2024

NSW GOVERNMENT

transport.nsw.gov.au

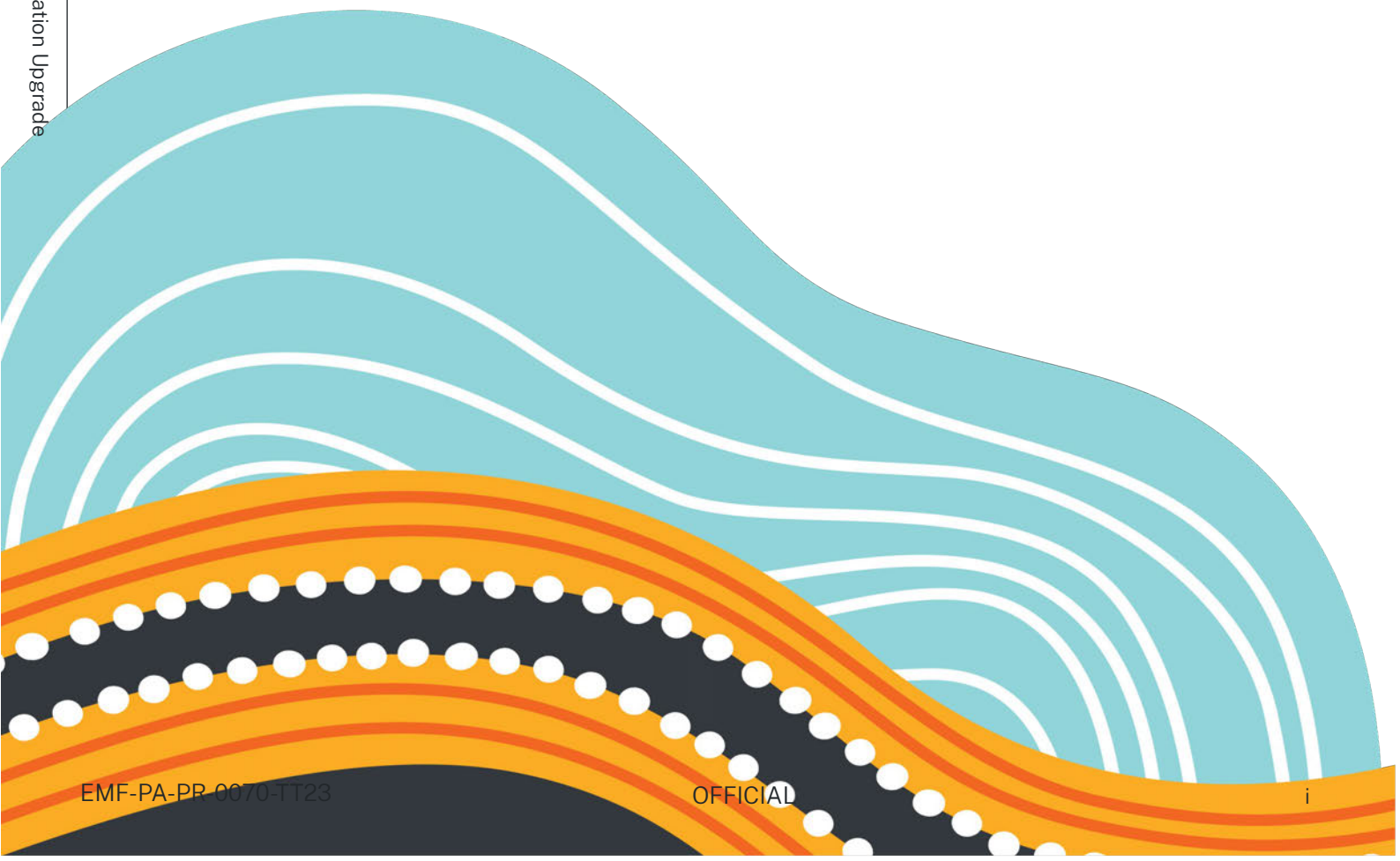
Acknowledgement of Country

Transport for NSW acknowledges the Gadigal/Bidjigal people of the Eora Nation, the traditional custodians of the land on which the Bardwell Park Station Upgrade is proposed.

We pay our respects to their Elders past and present and celebrate the diversity of Aboriginal people and their ongoing cultures and connections to the lands and waters of NSW.

Many of the transport routes we use today – from rail lines, to roads, to water crossings – follow the traditional Songlines, trade routes and ceremonial paths in Country that our nation's First Peoples followed for tens of thousands of years.

Transport for NSW is committed to honouring Aboriginal peoples' cultural and spiritual connections to the land, waters and seas and their rich contribution to society.



Connecting with Country Statement

Transport for NSW have engaged an Aboriginal Consultant to provide advice on and carry out Aboriginal engagement for the Bardwell Park Station Upgrade through a Connecting with Country Framework.

The Connecting with Country Framework outlines seven statements of commitment to assist the Proposal in fulfilling its obligations to Connecting with Country. These include:

- we will respect the rights of Aboriginal peoples to Indigenous cultural intellectual property, and we will support the right of Country to be cared for
- we will prioritise Aboriginal people's relationship to Country, and their cultural protocols, through education and enterprise by and for Aboriginal people
- we will prioritise financial and economic benefits to the Country where we are working, and by extension to the Traditional Custodians of that Country
- we will share tangible and intangible benefits with the Country where we are working, and by extension the Traditional Custodians of that Country, including current and future generations
- we will respect the diversity of Aboriginal cultures, but we will prioritise the local, place specific cultural identity of the Country we're working on. Aboriginal people will determine the representation of their cultural materials, customs and knowledge
- we will prioritise recognition and responsibility of Aboriginal people, supporting capacity building across Aboriginal and non-Aboriginal communities, and across government project teams
- we will support Aboriginal people to continue their practices of managing land, water and air through their ongoing reciprocal relationships with Country. We will create opportunities for traditional first cultures to flourish.

The Connecting with Country Framework guides and informs the design criteria for the Proposal by identifying opportunities for designing with Country and partnering with local knowledge holders and businesses throughout the project lifecycle.

Through engagement with the Metropolitan Local Aboriginal Land Council, Aboriginal Cultural Knowledge Holders and identified Aboriginal groups, this Framework provides an authentic voice and perspective of Aboriginal people from Aboriginal community representatives and provides opportunities to lead with Aboriginal knowledge to better connect with Country during planning and design of the project.

Prepared by Aurecon Australasia Pty Ltd and Transport for NSW.

This Review of Environmental Factors (and supporting specialist studies) was prepared for and is provided for the specific purpose of this Project and for use by Transport for NSW only.

Aurecon Australasia Pty Ltd makes no direct warranty or representation in favour of a third-party recipient regarding the accuracy, adequacy, suitability or completeness of this Review of Environmental Factors (and supporting specialist studies)

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Executive summary

The Proposal

Transport for NSW ('Transport') proposes to improve accessibility by upgrading Bardwell Park Station (the Proposal).

This Proposal is being delivered as part of the Safe Accessible Transport program, a NSW Government initiative announced in February 2024. The Safe Accessible Transport program aims to make public transport safe, inclusive and easy to use for all passengers, especially people with disability, older people, people with prams or luggage and others who may be experiencing mobility problems. The program will upgrade stations and wharves to achieve Disability Standards for Accessible Public Transport (DSAPT) compliance and improve amenity, access and safety, acknowledging the important role these locations have to the communities they serve.

Key features of the Proposal (refer to Figure E-1) include:

- construction of an elevated walkway at the existing station entrance from Hartill-Law Avenue to provide access to the platform via a new lift and new stairs
- upgrades to station access and interchange facilities on Hartill-Law Avenue, including:
  - relocation and upgrades to the bus stops
  - a new pedestrian crossing
  - one accessible parking space
  - one accessible kiss and ride space
  - additional bicycle parking
  - upgrade of existing footpaths from the upgraded bus stops and new accessible parking and kiss and ride spaces to the station entry
- modification to the existing station building to include a new family accessible toilet, a new unisex ambulant toilet and a new staff toilet
- provision of canopies at the Boarding Assistance Zone (BAZ) locations including new bench seats
- regrading and resurfacing of the platform and installation of tactile ground surface indicators (tactiles/TGSIs)
- ancillary works including station power supply upgrades, relocation of utilities, kerb and gutter adjustments, handrails and fencing, relocation of platform seating, additional Opal card readers, improvement to station communication systems (including CCTV cameras), landscaping and wayfinding signage
- placemaking enhancements that consider the war memorial and Connecting to Country.

Most work required for the Proposal would be carried out during standard daytime construction hours, however certain work may need to occur outside standard hours including during weeknights and weekends. Access would generally be maintained along Hartill-Law Avenue and to the station. However, there may be periods where temporary lane closures and three weekend full road closures are required to facilitate delivery of plant, equipment and materials, and construction work near the road. This would result in minor detours for motorists, pedestrians and cyclists to maintain safety around construction activities. Construction would also be required to occur within approximately six rail possessions, which are scheduled rail closures when part of the rail network is temporarily closed and trains are not operating. These temporary station closures during rail possessions would occur regardless of the Proposal.

Construction is expected to commence in early 2025 and would take around 18 months to complete.

This Proposal has been developed in accordance with Transport's Sustainability Plan and the Environment and Sustainability Policy. Avoiding and minimising adverse environmental impact, and realising environmental benefits and sustainability opportunities are key objectives of this Proposal.

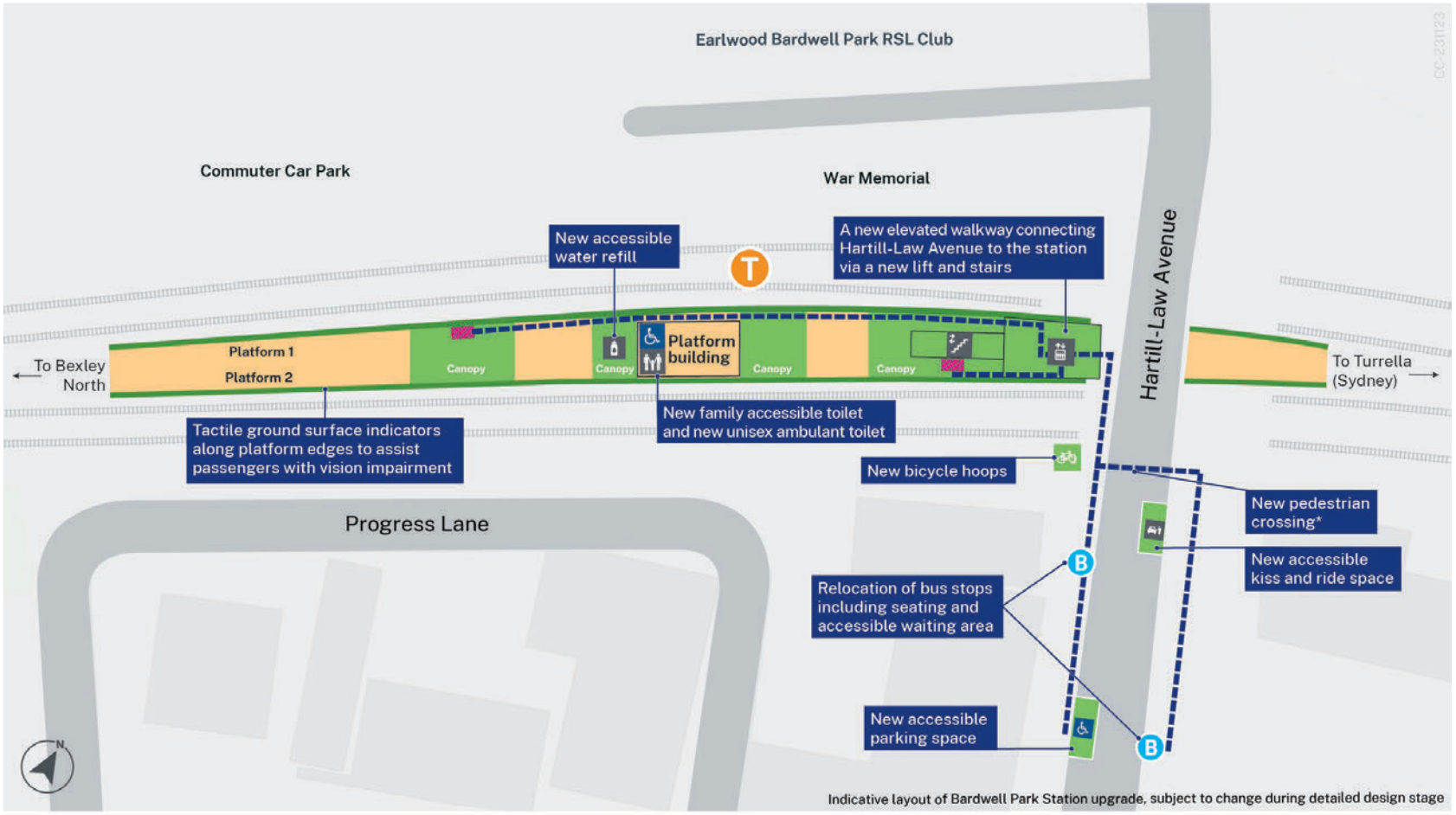

Figure E-1 Key Features of the Proposal

Need for the Proposal

The Proposal would make sure that Bardwell Park Station meets legislative requirements under the *Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport* 2002 (DSAPT).

The Proposal is designed to drive a stronger customer experience outcome, with improvements made to amenity, access and safety. The Proposal aims to deliver improved connectivity between modes (including greater opportunities for active transport), encourage greater public transport use by providing safe and welcoming spaces, and better integration of interchanges within the communities they serve.

Proposal objectives

The Safe Accessible Transport program aims to make public transport safe, inclusive and easy to use for all passengers, especially people with disability, older people, people with prams or luggage and others who may be experiencing mobility problems.

The program will upgrade stations and wharves to achieve DSAPT compliance, improving amenity, access and safety and acknowledging the important role these locations have to the communities they serve.

Options considered

Options for improving access to Bardwell Park Station were developed and assessed through an integrated urban design-led approach. The options analysis process considered different design options against the development criteria, which included urban design considerations, heritage requirements, ease of construction, potential environmental impacts, value for money and safety.

Three options were considered alongside a 'do-nothing' option to provide access to the station from the interchange facilities on Hartill-Law Avenue:

- Option 1: provision of an accessible connection via the existing road over rail bridge to accessible parking and other transport modes
- Option 2: provision of a new overbridge and three adjoining lifts to the west of the existing station entrance with new accessible connections to all the surrounding transport modes
- Option 3: provision of an accessible connection via the existing road over rail bridge to other transport modes and provision of a new accessible parking platform north of the station and a new pedestrian crossing in the centre of the Hartill-Law Avenue road over rail bridge.

Option 1 was selected as the preferred option as it provided the best constructability, accessibility, environmental and urban design and place-making outcomes.

Statutory and planning framework

The Proposal is for rail infrastructure facilities, as set out in Division 15 Subdivision 1 of the *State Environmental Planning Policy (Transport and Infrastructure) 2021* (SEPP Transport and Infrastructure), as it comprises upgrades to a railway station, station platforms and areas in a station complex that commuters use to get access to the platforms, public amenities for commuters and associated public transport facilities for railway stations, and is to be carried out by Transport. It can therefore be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979 (*EP&A Act*)*. Development consent from Council is not required.

The Proposal would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared nor approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required.

The Proposal would also be unlikely to have a significant impact on matters of national environmental significance or on Commonwealth land. Accordingly, the Proposal has not been referred to the Australian Government Department of Climate Change, Energy, the Environment and Water under the *Environment Protection and Biodiversity Conservation Act 1999*.

The Proposal would be designed having regard to the requirements of the *Disability Discrimination Act 1992*. The key objective of the Proposal is to improve the accessibility of Bardwell Park Station which is consistent with the objectives of this Act.

The Proposal would involve work on Hartill-Law Avenue, where this part of the road is a local road under the control of Bayside Council. The northern part of the road sits within the City of Canterbury-Bankstown LGA, however, no work is proposed within this part of the road. A Road Occupancy Licence would be obtained from the relevant roads authority for road work and any temporary road closures in accordance with section 138 of the *Roads Act 1993*.

The Proposal would involve work on Bardwell Park Station, which is listed on the Transport Asset Holding Authority (TAHE) Section 170 Heritage and Conservation Register. The *Heritage Act 1977* aims to protect items of State and local heritage significance, and includes requirements for approval and notification for impacts to items listed on the Section 170 Register.

Community and stakeholder consultation

Further community consultation activities for the Proposal would be undertaken during the public display period of this REF with the public invited to submit feedback to help Transport understand what is important to customers and the community. The REF would be displayed for a period of four weeks.

Information about these specific consultation activities is included in Section 5 of this REF.

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

In accordance with the requirements of the SEPP Transport and Infrastructure, consultation is required with local Councils and/or public authorities in certain circumstances, including where Council managed infrastructure is affected. Consultation has been undertaken with Sydney Trains, Transport and the Bayside Council during the development of design options and the preferred option. Consultation with these stakeholders would continue through the detailed design and construction of the Proposal.

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

Should the Proposal proceed to construction, the community would be kept informed prior to and during the construction period.

Environmental impacts

The main environmental impacts of the Proposal are:

Traffic and transport

Construction

Rail services would not be impacted by construction of the Proposal as existing planned rail possession periods (when the rail network would be shut down and the station closed) are to be utilised for construction activities that require access to the rail corridor.

However, there would be the following temporary traffic, parking and pedestrian impacts during construction:

- Up to 40 light vehicle trips per day during periods outside of rail possessions and 100 light vehicle trips per day during rail possession periods. This would have minimal impact on local traffic during construction as vehicle movements are anticipated to occur outside of the road network peak periods ie. AM and PM peak periods, and are not anticipated to have impacts on the performance of the road network.
- It is likely that three temporary, full weekend closures of Hartill-Law Avenue (overbridge section of the road) would be required to facilitate crane lifts to remove existing structures and install new infrastructure and for other work near the road. Local traffic detours would be required to cross over the rail line when this work is being carried out. There would also be some mid-week temporary partial road closures on Hartill-Law Avenue. During these closures, it is anticipated the full and partial closures on Hartill-Law Avenue would have moderate impacts on the road traffic. Appropriate detour routes and/or other traffic management arrangements would be implemented when these roads or lanes are temporarily closed.
- There would also be short-term delays to local road traffic on Slade Road from vehicles entering and exiting the site compound. However, these delays are not expected to put additional strain on the road network.
- There are sufficient unrestricted parking spaces in the surrounding local road network to accommodate construction worker parking and so impacts from construction worker parking are expected to be low.
- The Proposal would result in the temporary removal of up to 16 untimed parking spaces in the Slade Road car park to accommodate the site compound. The remainder of this car park would be kept open during construction.
- The Proposal also requires the permanent removal of three 15-minute timed council car parking spaces on the southern extent of Hartill-Law Avenue. This removal is to accommodate the construction of one new accessible car space, the relocation of the existing bus zones and the regrading of the footpaths along Hartill-Law Avenue.
- Bus stops would be temporarily relocated during temporary road closure periods. During this period, bus services may experience an increase in travel time between seven to 18 minutes using the indicative detour routes.
- Pedestrian access to the station would also be maintained outside of rail possession periods with temporary access stairs established on the eastern side of Hartill-Law Avenue, opposite the existing station entrance. This diversion may cause a two to three minute increase in travel time for pedestrians accessing the station. Pedestrians wishing to pass the station using the existing footpath on the station entrance side may experience similar travel time delays as a result of the footpath closure.
- During temporary road closures or other isolated aspects of construction management, cyclists may be required to dismount at select points. There are no impacts to cycling infrastructure as there are no existing cycling paths or bicycle hoops around Bardwell Park Station or along Hartill-Law Avenue. Therefore, impacts on cycling is expected to be minimal.

Operation

During operation, the Proposal would improve accessibility for pedestrians and customers including people with a disability or lower mobility and people with prams or luggage. The Proposal would provide compliant accessible access from the station entry and elevated walkway to the boarding assistance zones on each platform. The Proposal requires the permanent removal of three 15-minute timed council car parking spaces on the southern extent of Hartill-Law Avenue to accommodate the construction of one new accessible car space and the relocation of the existing bus zones, as well as the regrading of the footpaths along Hartill-Law Avenue. Due to the high availability of parking spaces near the station, this would have a minimal long-term impact on parking near the station.

The new raised pedestrian crossing on Hartill-Law Avenue would improve pedestrian connectivity around the station and it is expected to be highly utilised. However, there would likely be some delays and queuing of vehicles given the location of nearby bus stops and the proximity of the pedestrian crossing to the Hartill-Law Avenue and Slade Road signalised intersection.

Urban design, landscape and visual amenity

Construction

Construction of the Proposal would result in a temporary reduction in the urban design functionality and landscape character of the station and its surrounds. There would be temporary visual impacts for several receivers, including customers and residents. The presence of construction activities would result in moderate adverse urban and landscape character impacts within the rail corridor and the surrounding area. Visual impacts are expected to be moderate adverse, including viewpoints from Hartill-Law Avenue, residential receivers on Progress Lane, Earlwood Bardwell Park RSL and the station platform. The site compound within the existing Slade Road car park would be visible to Slade Road Reserve playground users and residents within adjacent apartments. It is expected that moderate adverse visual impacts would be experienced by these receivers during construction. In order to minimise visual impacts, work areas would be appropriately screened and maintained free from graffiti and unauthorised advertising where possible.

Operation

During operation, landscape character impacts are expected to be low beneficial with visual impacts experienced by the worst-affected receivers (residential receivers looking north towards the station entrance from Progress Lane) up to a moderate-low (neutral) impact. Opportunities to maximise the urban design and form of the Proposal would be implemented during detailed design through the development of an Urban Design and Landscape Plan.

Noise and vibration

Construction

Construction noise impacts are predicted to be the highest when noise intensive equipment is in use and work is near sensitive receivers. During standard daytime hours, the highest noise impacts are predicted at residential receivers to the south and east of the station (in NCA02) during vegetation removal and main construction work scenarios. This is due to the use of noise intensive equipment such as jack hammers, concrete saws, chippers or chainsaws. Up to six receivers in NCA02 are predicted to be Highly Noise Affected (that is, experience noise levels greater than 75 dBA) during excavation and piling, platform regrading and station access construction scenarios.

Some out-of-hours work may be required prior to weekend rail possessions for preparation works/deliveries, i.e. Monday night to Thursday night between 11.00 pm and 3.00 am. During evening periods, up to eight receivers in NCA02 are predicted to have ‘highly intrusive’ impacts (noise levels greater than 25 dBA exceedance of the Proposal’s adopted construction noise criteria) during station access work along Hartill-Law Avenue. During night-time periods, up to 24 residential receivers south of the station are predicted to have ‘highly intrusive’ impacts. The sleep disturbance screening criterion (52 dBA L_{Amax} for residential receivers) is likely to be exceeded where ‘moderately intrusive’ and ‘highly intrusive’ night-time work occurs near residential receivers.

Additional mitigation measures would be implemented for potentially affected sensitive receivers throughout construction, with potentially affected sensitive receivers to be confirmed during detailed design.

Commercial receivers along Hartill-Law Avenue are within the minimum working distances for cosmetic damage (i.e. within 20 metres for a vibratory roller). To minimise any potential impacts to these receivers, mitigation measures such as implementing different construction methods with lower source vibration levels, would be considered. Some commercial and residential receivers

surrounding the Proposal area located along Hartill-Law Avenue, Peck Lane, Slade Road, Devon Road, Crewe Street and Powys Avenue are within the minimum working distances for human comfort (within 100 metres for a medium vibratory roller). Occupants of affected buildings may be able to perceive vibration impacts at times when vibration intensive equipment is in use. Where impacts are perceptible, they would likely only be for relatively short durations when vibration intensive equipment is nearby.

Operation

The Proposal is not anticipated to result in additional operational noise and vibration impacts as the new station infrastructure and potentially increased patronage of the station are not anticipated to generate additional noise above existing levels or increase vibration.

Non-Aboriginal heritage

Construction

Construction of the Proposal would result in a minor to moderate adverse heritage impact on Bardwell Park Station as a result of the removal of the entry stair structure, which would be replaced by a new set of stairs and lift, along with a new elevated walkway with canopies and protection and anti-throw screens. These changes are deemed necessary to allow for improved accessibility at Bardwell Park Station and the improved use of the station by all customers. Heritage impacts to the station building include those from remodelling the internal layout of the building to create the family accessible toilet and unisex ambulant toilet, and the repurposing of two female toilets as a cleaner storage room and staff toilet. Although alterations to the station building would result in physical heritage impacts, these changes would allow for customers with accessibility needs to access station facilities more easily and would improve the user experience of the station building for all customers. Physical heritage impacts would also result from the regrading of the platform, installation of TGSIs along the platform, replacement of platform furniture, and installation of new canopies over the BAZs. Given these physical alterations would allow for improved use of the platform for customers with a disability, customers carrying luggage and customers with prams, alterations to this heritage fabric are considered justified.

Operation

During operation of the Proposal, a moderate adverse impact to the visual and physical heritage of the station is anticipated. The installation of more extensive canopies over the station entry, stairs and platforms would have a moderate adverse impact on the historic visual setting of the station. Moderate adverse physical heritage impacts are also anticipated as a result of the new stairs, lift and elevated walkway, which would alter the visual setting for the overbridge and wider station. Transparent materials would be selected as part of the Proposal where possible to provide high visibility and maintain sightlines of the station, which would contribute to minimising visual heritage impacts. Other alterations, including internal work within the station building, would result in moderate physical heritage impact and negligible to minor visual heritage impacts.

Biodiversity

The Proposal would involve the removal of two native trees, which would be offset by planting eight trees in accordance with the *Transport Tree and Hollow Replacement Guide (2022).*

Justification and conclusion

This REF has been prepared having regard to sections 5.5 and 5.7 of the EP&A Act, and section 171 of the EP&A Regulation, to ensure that Transport 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 Transport Sustainable Design Guidelines – Version 4.0 (Transport for NSW, 2017) taking into account the principles of ecologically sustainable development (ESD).

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

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.

Display of the review of environmental factors

This REF is on display for comment between 2 September 2024 and 29 September 2024. You can access the document in the following ways:

Internet

The documents are available as accessible pdf files on the Transport for NSW website at https://www.transport.nsw.gov.au/bardwell-park

Printed copies

Transport does not issue printed copies of the REF and supporting documents to static locations (i.e. Council and libraries) to improve sustainability outcomes.

Copies by request

Printed and electronic copies are available by contacting the Project Infoline on 1800 684 490, noting that there may be a charge for hard copies or USB.

Community drop-in sessions

- Wednesday 11 September, 10am to 12pm, Bexley North Library
- Thursday 25 September, 4pm to 6pm, Lil Hut Café, 6 Hartill-Law Avenue Bardwell Park.

How can I make a submission?

To make a submission about this Proposal can be submitted via:

A feedback form via the project webpage (www.transport.nsw.gov.au/bardwell-park)

In person at a community drop-in information session (details listed above)

Email: projects@transport.nsw.gov.au

Mail: Contact the below listed telephone number for a mailing address, if required.

Telephone: 1800 684 490

Submissions must be received by Sunday 29 September 2024. Submissions will be managed in accordance with the *Transport for NSW Privacy Statement*. A copy can be made available upon request.

What happens next?

Transport will collate and consider the submissions received during public display of the REF.

After this consideration, Transport will determine whether or not the Proposal should proceed as proposed and will inform the community and stakeholders of this decision.

If the Proposal is determined to proceed, Transport would continue to consult with the community and stakeholders prior to and during construction.

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Tables

Figures

1. Introduction

This chapter introduces the Proposal and provides context for the environmental assessment. In introducing the Proposal, the objectives and project development history are detailed and the purpose of the report provided.

1.1 Proposal identification

Transport for NSW (Transport) proposes to provide accessibility upgrades to Bardwell Park Station as part of the Safe Accessible Transport program (the Proposal). The station is on the Sydney Trains T8 Airport and South line services, located in the Bayside Local Government Area (LGA).

The Safe Accessible Transport program is a NSW Government initiative announced in February 2024. The Safe Accessible Transport program aims to make public transport safe, inclusive and easy to use for all passengers, especially people with disability, older people, people with prams or luggage and others who may be experiencing mobility problems. The Proposal would improve accessibility of the station in line with the requirements of the *Commonwealth Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT).

Key features of the Proposal include:

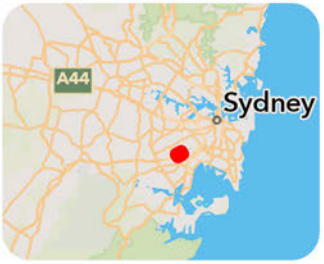
- construction of an elevated walkway at the existing station entrance from Hartill-Law Avenue to provide access to the platform via a new lift and new stairs
- upgrades to station access and interchange facilities on Hartill-Law Avenue, including:
  - relocation and upgrades to the bus stops
  - a new pedestrian crossing
  - one accessible parking space
  - one accessible kiss and ride space
  - additional bicycle parking
  - upgrade of existing footpaths from the upgraded bus stops and new accessible parking and kiss and ride spaces to the station entry
- modification to the existing station building to include a new family accessible toilet, a new unisex ambulant toilet and a new staff toilet
- provision of canopies at the Boarding Assistance Zone (BAZ) locations including new bench seats
- regrading and resurfacing of the platform and installation of tactile ground surface indicators (tactiles/TGSIs)
- ancillary works including station power supply upgrades, relocation of utilities, kerb and gutter adjustments, handrails and fencing, relocation of platform seating, additional Opal card readers, improvement to station communication systems (including CCTV cameras), landscaping and wayfinding signage
- placemaking enhancements that consider the war memorial and Connecting to Country.

The location of the Proposal is shown in Figure 1-1 and an overview of the Proposal is provided in Figure 3-1. Chapter 3 describes the Proposal in more detail.

Path: C:\Users\Virgil.Robinson\Aurecon Group\526819 - Safe Accessible Transport program Planning Approvals Contractor - GIS\Proj\P526819_SATP_REF.aprx

Project No. P522314 Map Author: Virgil.Robinson Date: 11/07/2024 Revision: 0

- Proposal area
- Site compound
- Train Station
- Railway
- Watercourse



Source: Aurecon, TfNSW, NSW Spatial Services (DCS), ESRI

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Projection: GDA2020 MGA Zone 56

Safe Accessible Transport program - Bardwell Park Review of Environmental Factors

Figure 1-1 Location of the Proposal

1.2 Purpose of the report

This review of environmental factors (REF) has been prepared by Aurecon Australasia Pty Ltd on behalf of Transport. For the purposes of these works, Transport is the proponent and determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979 (NSW)* (EP&A Act).

The purpose of the REF is to describe the Proposal, to document the likely impacts of the Proposal on the environment, and to detail mitigation measures to be implemented.

The description of the proposed work and assessment of associated environmental impacts has been undertaken in the context of section 171 and 171A of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation), the factors in Guidelines for Division 5.1 assessments (DPE, 2022), the *Biodiversity Conservation Act, 2016* (BC Act), the *Fisheries Management Act 1994* (FM Act), and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)* (EPBC Act).

In doing so, the REF helps to fulfil the requirements of:

- Section 5.5 of the EP&A Act including that Transport examine and take into account, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

The findings of the REF would be considered when assessing:

- Whether the Proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval sought from the Minister for Planning under Division 5.2 of the EP&A Act.
- The significance of any impact on threatened species as defined by the BC Act and/or FM Act, in section 1.7 of the EP&A Act and therefore the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report
- The significance of any impact on nationally-listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and if offsets are required and able to be secured.

The potential for the Proposal to significantly impact any other matters of national environmental significance or Commonwealth land and the need to make a referral to the Australian Department of Climate Change, Energy, the Environment and Water for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the EPBC Act.

2. Need and options considered

This chapter describes the need for the Proposal in terms of its strategic setting and operational need. It identifies the various options considered and the selection of the preferred option for the Proposal.

2.1 Strategic need for the Proposal

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.

The Proposal forms part of the Safe Accessible Transport program. This program is designed to drive a stronger customer experience outcome, with improvements made to amenity, access and safety. The Proposal aims to deliver improved connectivity between modes including greater opportunities for active transport, encourage greater public transport use by providing safe and welcoming spaces, and better integration of interchanges within the communities they serve.

Transport is a significant agent of equality and a driver of social and economic activity; accessible transport enables people with disability to participate fully in their community and the economy. A safe, equitable and integrated transport network is important in enabling people across the state to travel safely and confidently to work, appointments, holidays, events, and to visit friends and family.

There are several initiatives underway across the state, focused on ensuring we deliver accessible services to all passengers, regardless of a person's accessibility needs, socio-economic circumstance, or location.

We are making public transport options safer and more accessible by upgrading stations and wharves, improving the built environment through the installation of more lifts, widening platforms and improving signage and wayfinding. Improving safety particularly for women, girls and gender diverse peoples is also a key aim of the program including improving lighting and active and passive surveillance at transport hubs. The modernisation of the network also helps bring ageing infrastructure in line with legislative requirements, making transport services easier to use for everyone.

Our approach to achieving equal access to our network is underpinned by legislation.

The purpose of the Commonwealth *Disability Discrimination Act 1992* (DDA) is to eliminate discrimination against people with a disability in a variety of areas such as employment, services and education. As Transport provides public transport services, we are required to upgrade the public transport network to remove discrimination in accessing public transport on the basis of disability. The Disability Standards for Accessible Public Transport set out minimum accessibility requirements for public transport providers and ensure that people with disability have equivalent access to public transport services.

The Safe Accessible Transport program will contribute towards the NSW Government's investment in addressing public transport stations, wharves and stops that do not currently meet the requirements of the Disability Standards for Accessible Public Transport 2002 (DSAPT).

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
Future Transport Strategy (Transport, 2022a)	*Future Transport* is an update of NSW's *Future Transport 2056* and NSW's *Long Term Transport Master Plan*. It is a suite of strategies and plans for transport to provide an integrated vision for the state. *Future Transport* identifies 14 strategic directions to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport.	The Proposal aligns with the Future Transport Strategy by providing accessible services for people who find it difficult to access public transport services. The Proposal includes an upgrade to the station entry with a new lift to the platform, accessible platform facilities and upgrades to footpaths to improve access to the bus stops on Hartill-Law Avenue, the new accessible parking space and the new accessible kiss and ride space. This allows for greater choice for customers with mobility constraints to access public transport. Greater accessibility would also mean better connections to places and opportunities for employment, education, business and recreation. Accessible transport (such as that provided by the Proposal) enables people with disability to participate fully in their community and economy. The financial benefits of the Proposal are consistent with the financial sustainability objectives outlined in the Future Transport Strategy. The Proposal also contributes to the vision to reduce social inequality, with input sought from key stakeholders including local people with disability, Aboriginal and Torres Strait Islander people and women and girls from the local community. Finally, through the design and planning approval process, the Proposal design has been refined and would continue to be refined to minimise impacts to the environment and promote environmental sustainability outcomes of the Future Transport Strategy.
NSW Disability Inclusion Action Plan (2021 - 2025) (NSW Government, 2021)	The *NSW Disability Inclusion Plan 2021-2025* was developed by the NSW Government and seeks to provide actions to support making mainstream services and community facilities accessible for people with a disability. The plan provides four focus areas for all of Government. Relating to public transport is Focus Area 2 which seeks to create liveable communities. Actions under this Focus Area target an increase in the availability and accessibility of public and private transport options for people with disability.	The Proposal has been developed with consideration of the objectives of this plan and seeks to provide equitable access to Bardwell Park Station. The Proposal supports Focus Area 2: creating liveable communities in the Plan as it would directly contribute to the accessibility of public transport for people with a disability. It would achieve this through installation of a new lift, upgraded footpaths, an accessible kiss and ride space, an accessible parking space, as well as new hearing loops, new bench seats, installation of TGSIs, upgraded signage and wayfinding and improved accessibility to station toilets.

Policy / strategy	Overview	How the Proposal aligns
A Metropolis of Three Cities - Greater Sydney Region Plan (Greater Sydney Commission, 2018a)	The *Greater Sydney Region Plan* is the NSW Government's 40-year land use plan for Sydney. It establishes a vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City. One of the 10 directions of the framework relevant to the Proposal is A city for people - celebrating diversity and putting people at the heart of planning.	The Proposal would enable equitable access to services and employment via the Sydney Trains network as well as social and cultural opportunities through investment in transport. The proposed upgrades to Bardwell Park Station would promote public transport movements, walking and cycling, which contribute to the character and identity of the area and create a more accessible and walkable city.
South District Plan (Greater Sydney Commission, 2018b)	The South District Plan has been prepared to align with the visions and objectives of the Greater Sydney Region Plan. The South District, which includes Bayside Council and the suburb of Bardwell Park, forms part of the Eastern Harbour City under the Greater Sydney Region Plan. Providing services and social infrastructure to meet people's changing needs forms Planning Priority S3 under the plan.	The Proposal would improve safety surrounding Bardwell Park Station through strategic changes to interchange facilities on Hartill-Law Avenue as well as improvements to the existing footpaths. It would also improve safety for people using train facilities through the installation of a new lift, new stairs (with canopy and protection and anti-throw screens), additional handrails and fencing, improved CCTV, wayfinding signage and installation of TGSIs. The Proposal also provides accessible and inclusive public transport through provision of an accessible parking space, installation of a new lift as well as new family accessible and unisex ambulant toilets.
Staying Ahead: State Infrastructure Strategy 2022-2042 (Infrastructure NSW, 2022)	The *State Infrastructure Strategy 2022-2042* makes recommendations for each of NSW's key infrastructure sectors including Transport. The strategy notes the importance of infrastructure development in boosting economy-wide productivity and competitiveness.	The Proposal would contribute to equitable access to services and employment via the Sydney Trains network through the proposed upgrades to Bardwell Park Station. This would contribute to economic productivity of the wider region.

Policy / strategy	Overview	How the Proposal aligns
Future Bayside: A land-use vision to 2036 Bayside Council Local Strategic Planning Statement (Bayside Council, 2020)	*Future Bayside: A land-use vision to 2036* is the 20 year vision for land use in the within the Bayside Council LGA. It describes the special character and values that are to be retained and how change will be managed over a 20 year period. The Strategy outlines 24 planning priorities. Of these planning priorities, B5 Foster healthy, creative, culturally rich and socially connected communities, seeks to create liveability through accessible transport.	The Proposal would support planning priority B5 in the Statement as it would aim to provide a healthy, safe and inclusive place for people of all ages and abilities. Key features of the Proposal that would support this include a new lift and elevated walkway, changes to interchange facilities on Hartill-Law Avenue, modification to the existing station building to include a new family accessible toilet, a new unisex ambulant toilet, new bench seats and TGSIs on the station platform.
Bayside 2032: Community Strategic Plan 2018-2032 (Bayside Council, n.d.a)	*Bayside 2032* describes how Bayside Council aims to meet the challenges and opportunities that will affect the community in the future. The plan outlines four Themes, with Theme Four (In 2032 our people will be connected in a creative City) aiming to provide services and facilities which ensure all community members feel a sense of belonging, including children, families, young people, and seniors.	The Proposal would align with Theme Four of this Plan by providing facilities in the station upgrade that are inclusive of all community members. The design has also considered the Connecting with Country Framework, particularly around collaborating with Aboriginal knowledge holders and communities throughout the design process.
Bayside Council Disability Inclusion Action Plan 2022-2026 (Bayside Council, n.d.b)	Council's Disability Inclusion Action Plan 2022-2026 (DIAP) details the actions Council will take over the next four years to improve the way people with disability access services and participate in community life.	The Proposal aligns with this Plan as it would improve the accessibility to transport services for people with a disability within Bayside Council area.

2.2 Limitations of existing infrastructure

Existing infrastructure at Bardwell Park Station that poses a safety and accessibility issue, including non-compliances with DSAPT criteria, include:

- the entry from Hartill-Law Avenue via stairs, which limits those with mobility issues, including people with a disability, the elderly, people with prams or luggage and others, from easily and safely accessing the station as no lift is available
- the lack of accessible parking, accessible kiss and ride spaces and accessible paths from bus stop boarding points to the entry to the station. This requires people with mobility issues to park further away and travel on potentially uneven ground or steep slopes to access the station and its facilities
- the lack of hearing augmentation systems, which means some people with hearing impairment may not be able to hear important stop or station announcements
- the lack of allocated wheelchair seating areas, BAZ location or wheelchair allocated parking spaces on the platform
- the platforms slope towards the platform edge, which poses a safety issue particularly for those in a wheelchair or prams as the gradient is inclined towards the rail line
- the lack of TGSIs on the platform or bottom of the stairs, which poses a safety issue for people with visibility impairments as they may not be able to identify the platform edge or bottom of the stairs.

The Proposal aims to overcome these limitations through providing upgrades to the station that would improve safety as well as address accessibility issues.

2.3 Proposal objectives and development criteria

2.3.1 Objectives of the Safe Accessible Transport program

The Safe Accessible Transport program aims to make public transport safe, inclusive and easy to use for all passengers, especially people with disability, older people, people with prams or luggage and others who may be experiencing mobility problems.

The program will upgrade stations and wharves to achieve DSAPT compliance, improving amenity, access and safety and acknowledging the important role these locations have to the communities they serve.

The delivery of upgrades as part of the Safe Accessible Transport program aims to provide a range of benefits as outlined in Table 2-2.

Table 2-2 Objectives of the Safe Accessible Transport program

Category	Objectives
Accessible services	• upgrades should achieve compliance to provide public transport that is accessible for all passengers
Successful places	• complement and integrate with existing and future communities with consideration given to future land use, and supporting economic and place-making objectives in centres.
Efficient Improved connectivity for passengers	• provide improvements to multi-modal connectivity to give passengers options, including active transport options • replace car trips to destinations and centres with public and active transport modes
Adaptability	• support the future needs of customers and consider emerging transport trends, growth and technologies • plan and design infrastructure that is resilient and able to adapt to future uses and scenarios
Sustainability	• deliver upgrades which make adaptive reuse of existing assets to reduce the projects carbon footprint • construction methodologies and engineering solutions that drive a reduction of GHG emissions, energy usage and innovation • limit environmental impacts and contribute to the NSW Government's aspirational target to achieve net-zero emissions by 2050 • maximise the construction phase benefits to the local economy by using local businesses and engaging a workforce that reflects the local social demographic of the area

2.3.2 Proposal objectives

The objectives of the Proposal include:

- provide a station that is accessible to people with disability, older people, people with prams or luggage and others who may be experiencing mobility problems
- improve customer experience (weather protection, better interchange facilities and visual appearance)
- minimise pedestrian conflict and crowding points
- improve integration with surrounding precinct
- improve customer safety
- improve wayfinding in and around the station
- respond to the heritage values of the site
- improve customer amenity
- maintain/create cross corridor access/pedestrian links to Hartill-Law Avenue.

2.3.3 Sustainability objectives

The NSW Government aspires to provide a world class sustainable transport system that meets customer expectations and optimises the economic development of NSW. Transport is a key enabler of economic and social activity.

Consistent with the Future Transport Strategy, Transport is committed to managing impacts on the environment and operating in an environmentally sustainable manner. These commitments are set

out in the Transport Environment and Sustainability Policy (Transport for NSW, 2020) and the Net Zero and Climate Change Policy (Transport for NSW, 2023b).

Sustainability objectives for the Proposal have been developed to align to Transport's sustainability policies, plans and guidelines to respond to material sustainability issues and opportunities.

The sustainability objectives for the Proposal align with Transport's Sustainability Plan objectives, which are to:

- respond to climate change
- protect and enhance biodiversity
- improve environmental outcomes
- procure responsibly
- partner with communities
- respect culture and heritage
- align spend and impact
- empower customers to make sustainable choices.

Chapter 8 provides details of sustainability issues, opportunities and initiatives for the Proposal.

2.3.4 Urban design objectives

Urban design objectives for the Proposal are to:

- develop an integrated design that fits with the existing visual qualities, ecology and character of Bardwell Park Station
- minimise impacts to the integrity of heritage sites, significant trees and cultural values of the community within the Proposal area
- contribute to the functionality public spaces and enhance local and regional connectivity.

These urban design objectives have been developed with consideration for the 'Around the Tracks' - Urban design for heavy and light rail (Transport, 2016) objectives to:

- create liveable, sustainable and productive precincts
- create places for people
- optimise investment in heavy and light rail.

2.3.5 Development criteria

The development criteria for the Proposal include:

- urban design principles
- heritage consideration
- constructability and key risks
- geotechnical risks
- environmental impacts including existing vegetation, visual, traffic and noise
- value for money
- safety.

2.4 Options considered

2.4.1 Methodology for selection of preferred option

Options for improving access to Bardwell Park Station were developed and assessed through an integrated urban design-led approach. The options analysis process considered different design options against the criteria outlined in Section 2.3.5.

A design critique approach was adopted to validate whether the preferred options for Bardwell Park Station should be progressed through to the concept design stage. A design critique is a multi-disciplinary group review of the options and design to provide feedback on if the design objectives have been achieved. This review considered compliance with the client requirements, opportunities for innovation and adequate management of risks.

2.4.2 Identified options

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

Three options were considered alongside a 'do-nothing' option to provide access to the station from the interchange facilities on Hartill-Law Avenue.

Do nothing option

Under a 'do-nothing option', existing access to the station and platforms would remain the same with no change to the station layout, surrounding roads, footpaths and interchange facilities.

Option 1

Option 1 includes the provision of an accessible connection via the existing road over rail bridge to accessible parking and to other transport modes. Construction would involve standard entry to the station with key features including a new lift, stairs and elevated walkway, as well as a ramp to the proposed accessible parking area.

Three sub-options were assessed as part of option 1 to better refine the design and meet the Proposal design objectives in relation to the location of accessible parking spaces. The sub-options analysed included:

- sub-option 1A: accessible connection to accessible parking spaces in existing commuter parking spaces in the Earlwood Bardwell Park RSL (EBP RSL) car park north of the station
- sub-option 1B: accessible connection to accessible parking spaces in existing on-street parking spaces within the local centre south of the station
- sub-option 1C: accessible connection to accessible parking spaces in existing Council parking spaces in Progress Lane south of the station.

Option 2

Option 2 includes the provision of a new station overbridge and three adjoining lifts to the west of the existing station entrance with new accessible connections to all surrounding transport modes.

Option 3

Option 3 is similar to Option 1 (utilising the existing road over rail bridge as the new entry with an accessible path provided via a lift to the platform) however this option includes the provision of a new accessible parking platform north of the station and a new pedestrian crossing in the centre of Hartill-Law Avenue bridge. Key features would include a new suspended slab parking platform.

2.4.3 Analysis of options

'Do nothing' option

The 'do nothing' option was not considered a feasible alternative as it would be inconsistent with the legislative requirements and NSW Government objectives for improving the accessibility of transport interchanges, train stations and commuter car parks across NSW as a priority under the Safe Accessible Transport program. The 'do nothing' option would also not encourage the use of public transport as no pedestrian upgrades would be made.

Option 1: accessible connection via existing road over rail bridge

This option satisfied all the urban design objectives and the design principles in the *Urban Design Best Practice Guidelines: Around the Tracks urban design for heavy and light rail* (Transport, 2016), except for 'pedestrian permeability and connectivity' (design principle 3) and 'maximise view opportunities' (design principle 7). Option 1 partially satisfied these criteria. This option was the best value for money option compared to options 2 and 3.

From this option, the following sub-options were considered and analysed against the design principles (Table 2-3).

Table 2-3 Sub-options analysis

Option	Analysis
Sub-option 1A: accessible connection to accessible parking spaces in the location of the existing commuter parking spaces in the EBP RSL car park north of the station	This sub-option would result in a lengthy and time-consuming journey for the customer, resulting in overall poor customer experience. A key feature of this sub-option was to install a ramp connecting accessible parking spaces to Hartill-Law Avenue with an accessible path of travel to the station entry. However, the ramp was too steep, did not meet slope specifications and would have adverse impacts to the war memorial located next to the EBP RSL car park.
Sub-option 1B: accessible connection to accessible parking spots in the location of existing parking spaces in the shopping area south of station	This sub-option had the closest accessible parking spots connection to the station and station interchange compared to sub-options 1A and 1C.
Sub-option 1C: accessible connection to accessible parking spots in the location of existing on-street Council parking south of station	This sub-option had a lower visual impact to the heritage building compared to sub-option 1A. However, similar to sub-option 1A, this sub-option would result in a lengthy and time-consuming journey for the customer, resulting in overall poor customer experience. This sub-option also had security concerns due to sightline clearances and lighting requirements.

Option 2: provision of a new elevated walkway and three lifts, west of the existing station entrance.

This option only met three out of the eight design principles including 'value for money' (design principle 2), 'protect and enhance heritage features and trees' (design principle 6) and 'customer and community focussed (design principle 8).

It did not satisfy the design principle of 'pedestrian permeability and connectivity' and only partially satisfied 'integrate the Proposal with the local context' (design principle 4) and 'maximise the amenity of the public domain (design principle 5) and 'maximise view opportunities' (design principle 7).

This option would have the most impacts to existing infrastructure compared to Option 1 and Option 3 including impacts to existing high voltage cables and overhead wiring structures. In addition, additional piling would be required to establish a new elevated walkway including new station overbridge compared to Options 1 or 3. This option would be located the furthest away from the station interchange facilities as well as the Bardwell Park local centre, and would also have the highest cost of construction compared to Option 1 and 3, as well as high operational and maintenance costs. There were also security concerns associated with this option as there would be multiple entries as well as concerns due to sightlines and lighting requirements.

Option 3: provision of a new accessible parking platform north of the station

This option would result in a lengthy and time-consuming journey for the customer as the connection between the accessible parking spaces to the station was considered too far compared to sub-option 1A, sub-option 1C and Option 2.

2.5 Preferred option

Option 1 was selected as the preferred option as it best met the engineering and constructability criteria as well as most of the design principles (all except design principle 3 and 7). Option 1 was identified as the preferred option over Option 2 and 3 due to better value for money, proximity to the station entry and it minimised visual impact from the main entry from the local centre. This option provided the greatest value for money compared with Options 2 and 3. From the preferred main option, sub-option 1B best met the criteria as the proposed new parking spaces were located the closest to the station entry as well as existing station interchange facilities. This sub-option was carried through to the concept design stage for development.

2.6 Design refinements

Following the selection of Sub-option 1B as the preferred option, the following design refinements have been carried out:

- the proposed new pedestrian crossing on Hartill-Law Avenue was relocated closer to the Bardwell Park shopping village (moved about 20 metres south). Further refinements to the pedestrian crossing design would continue to be made through the community and stakeholder feedback process
- change from a continuous platform canopy to smaller canopies at the BAZ locations. By having smaller multiple canopies this retains the original sense of the platform and the station building as independent heritage structures
- to improve sight lines, the proposed accessible parking space is now located behind the proposed bus bay location rather than in front of the bus bay.

3. Description of the Proposal

This chapter describes the Proposal and provides descriptions of existing conditions, the design parameters including major design features, the construction method and associated infrastructure and activities.

3.1 The Proposal

Transport proposes to provide accessibility and safety upgrades to Bardwell Park Station as part of the Safe Accessible Transport program. The Proposal would improve accessibility of the station in line with the requirements of the Commonwealth *Disability Discrimination Act 1992* (DDA) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT). The Proposal is shown in Figure 3-1 with an indicative visual representation of the proposed station entry shown in Figure 3-2.

Key features of the Proposal include:

- construction of an elevated walkway at the existing station entrance from Hartill-Law Avenue to provide access to the platform via a new lift and new stairs
- upgrades to station access and interchange facilities on Hartill-Law Avenue, including:
  - relocation and upgrades to the bus stops
  - a new pedestrian crossing
  - one accessible parking space
  - one accessible kiss and ride space
  - additional bicycle parking
  - upgrade of existing footpaths from the upgraded bus stops and new accessible parking and kiss and ride spaces to the station entry
- modification to the existing station building to include a new family accessible toilet, a new unisex ambulant toilet and a new staff toilet
- provision of canopies at the Boarding Assistance Zone (BAZ) locations including new bench seats
- regrading and resurfacing of the platform and installation of tactile ground surface indicators (tactiles/TGSIs)
- ancillary works including station power supply upgrades, relocation of utilities, kerb and gutter adjustments, handrails and fencing, relocation of platform seating, additional Opal card readers, improvement to station communication systems (including CCTV cameras), landscaping and wayfinding signage
- placemaking enhancements that consider the war memorial and Connecting to Country.

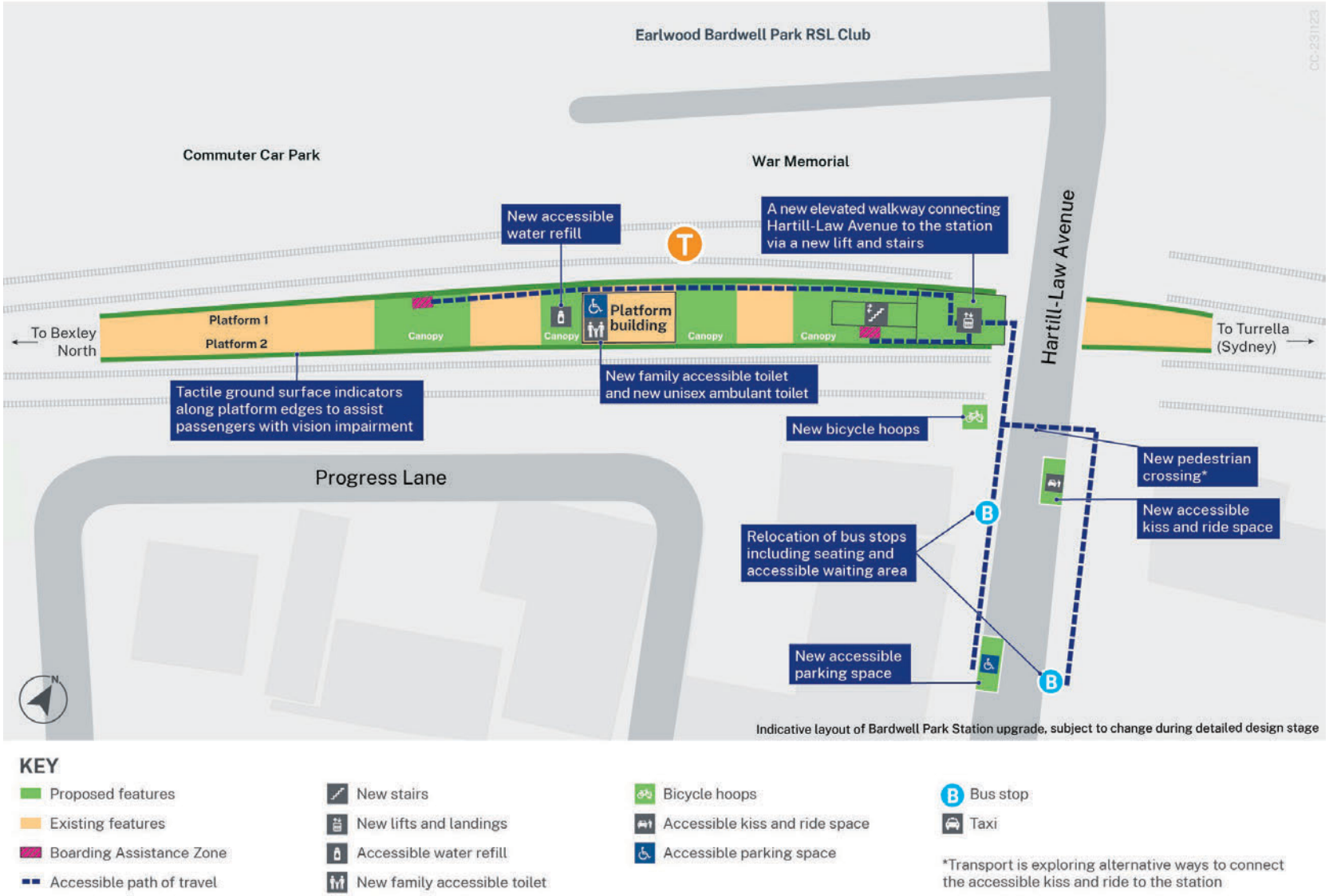


Figure 3-1: Key features of the Proposal – Bardwell Park Station upgrade

Figure 3-2 Indicative 3D impression of the Bardwell Park Station entry – facing north-west (subject to detailed design)

3.1.1 Station entry work

The construction of the new station entry would involve:

- removal of the existing stairs linking Hartill-Law Avenue overbridge to the platform
- construction of a new elevated walkway with canopy and protection and anti-throw screens
- construction of a new 17-person lift from the new station entry to the platform
- construction of new stairs to the platform from the station entry, including canopy and protection and anti-throw screens.

To maintain access to the station during the upgrade, temporary stairs would be constructed. The design and staging of the temporary access arrangements would be determined during the detailed design phase of the Proposal.

3.1.2 Station access and interchange facilities

Modifications to the station interchange facilities on Hartill-Law Avenue would include:

- provision of a raised pedestrian crossing connecting the station entry to the new kiss and ride and bus stop on the eastern side of Hartill-Law Avenue
- provision of a new accessible parking space and a new accessible kiss and ride space on the eastern side of Hartill-Law Avenue
- slight relocation of, and upgrades to, the existing bus stops on either side of Hartill-Law Avenue, including new bench seating and installation of new tactiles
- provision of four new bicycle hoops including the construction of a new foundation on the western side of Hartill-Law Avenue near to the new station entrance
- upgrading of footpaths, kerb adjustments and alterations to the crash barriers.

3.1.3 Platform and station building modifications

Modifications would be required to the station building to improve accessibility while also minimising impacts to existing heritage fabric. Station building modifications would include upgraded toilets to provide one unisex family accessible toilet, one unisex ambulant toilet, and one staff toilet (to replace the existing separate female and male toilets). This would involve:

- removal of the existing tiles and fittings, and existing partition walls
- removal of the existing floor slab and external step
- relocation of cleaners' storage and equipment to a new cleaners' room
- replacement of doors, tiles and trim to match existing heritage features.

Modifications to the station building are shown in Figure 3-3.

Further modifications to the platforms surrounding the station building would include:

- regrading and resurfacing of the platforms
- removal of non-heritage fabric canopies from existing platform building and replacement with canopies at each end of the station building (original platform building canopy to remain)
- provision of canopies over the boarding assistance zones
- installation of tactile ground surface indicators (TGSIs).

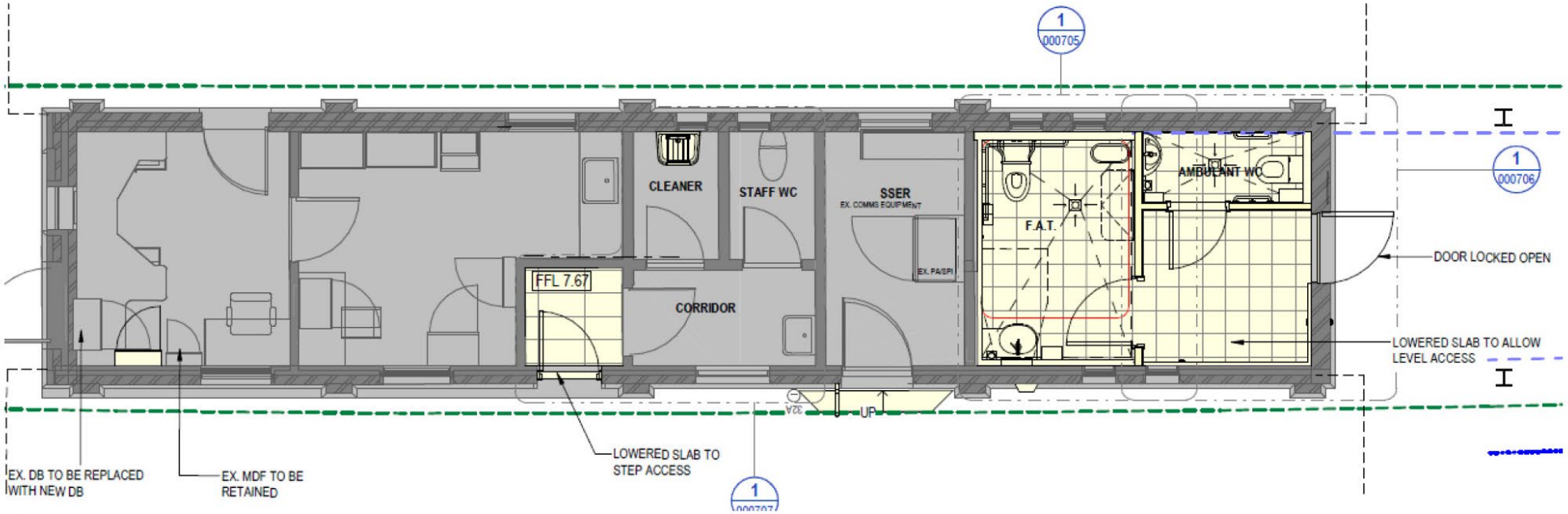


Figure 3-3 Proposed station building layout – indicative only, subject to detailed design

3.1.4 Ancillary work

The ancillary work required as part of the Proposal would include:

- improvements to customer information and communication systems, including upgraded wayfinding and other station signage, new hearing loops along the station platforms, relocation of public announcement (PA) speakers and new and upgraded CCTV cameras
- upgraded lighting
- services and utilities protection, adjustments and/or relocations
- adjustments to lighting and electrical services requiring trenching, including removal of the footing of the redundant overhead wiring structure, earthing and bonding of electrical equipment and new or modified structures
- upgrades to the station power supply including replacing the existing isolation transformer with a padmount transformer
- adjustments to station furniture, including the locations of seating, opal card readers, ticketing facilities, vending machines, bins and the existing Telstra public payphone
- Connecting With Country initiatives
- heritage interpretation/ conservation.

3.1.5 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, to integrate within the context of the place and to be aesthetically pleasing.

Availability and constructability are also important criteria to ensure that materials are readily available and the structure can be built with ease and efficiency. Materials are also selected for their application based on their suitability for meeting design requirements. Each of the upgraded or new facilities would be constructed from a range of different materials, with a different palette for each architectural elements. Subject to detailed design, the Proposal would include the following:

- lift shafts – concrete with aluminium panels, stainless steel cladding and glass
- elevated walkway– concrete base with lightweight screens and metal roof sheeting
- platform stairs – concrete with lightweight screens and steel canopy
- platform canopies – steel frame and glazed panels.

The design would be submitted to Transport's Design Review Panel at various stages for comment before being accepted by Transport. An Urban Design and Landscape Plan (UDLP) would also be prepared by the Contractor, prior to finalisation of detailed design for endorsement by Transport.

Indicative photomontages of the Proposal are shown in Figure 3-4 to Figure 3-6.

Figure 3-4 Indicative 3D impression of Bardwell Park Station entry from Hartill-Law Avenue – subject to detailed design

Figure 3-5 Indicative 3D impression of Bardwell Park Station entry from Hartill-Law Avenue – subject to detailed design

Figure 3-6 Indicative 3D impression of Bardwell Park Station platforms – subject to detailed design

3.2 Design

3.2.1 Design criteria

The Proposal would be designed having regard to the following:

- Disability Standards for Accessible Public Transport 2002 (issued under the Commonwealth Disability Discrimination Act 1992)
- National Construction Code
- Relevant Australian Standards
- Asset Management Branch Standards
- Transport standards
- Transport Sustainable Design Guidelines – Version 4.0 (Transport for NSW, 2017)
- Crime Prevention Through Environmental Design (CPTED) principles
- other Transport policies and guidelines
- Council standards or guidance documents where relevant.

3.2.2 Engineering constraints

There are a number of constraints which have influenced the design development of the Proposal, these include:

Existing structures: the placement and integrity of existing structures needed to be considered during the development of the design – these structures included the existing stairs, the platform, the station building, the existing canopies on the platform, and the bridge carrying Hartill-Law Avenue over the railway line.

Heritage requirements: Bardwell Park Railway Station Group is listed on the TAHE Section 170 Heritage and Conservation Register (#4801896). Bardwell Park Railway Station has historical significance as a major public work completed as an unemployment relief project during the Great Depression, and as a major transport hub for Bardwell Park since 1931. Heritage considerations have been incorporated into the Proposal's design (refer to Section 6.5).

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 existing infrastructure and safe working provisions.

Construction access: for specific construction activities, such as construction of the new station entry, as well as the accessible parking and kiss and ride spaces and upgrades to bus stops, construction access would require traffic control on Hartill-Law Avenue, including full closures at times. Space constraints limit the potential locations for crane set up to enable the lifting of large items to be undertaken, necessitating the closure of the road.

Public access: during construction, access to Bardwell Park Station would be maintained, via temporary access stairs except during rail possession periods when no trains would be running. These stairs would be installed on the eastern side of Hartill-Law Avenue, adjacent to the existing station entrance location.

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

- gas pipeline
- electrical cables
- telecommunication cables
- stormwater pipes
- water pipes.

3.2.3 Consideration of heritage in design

Heritage considerations have been incorporated into the Proposal's design as follows:

- The overall form of the entrance would retain the character of the original stairway entrance into the station from the overhead bridge
- At street level, the new lift would fit snugly into the new station entry while at platform level the lift shaft would be located behind the stairs, out of view of the station building
- The scale of the new canopies has been designed to minimise impact to the existing station elements. The series of canopies across the platform is preferred to one continuous canopy as it would retain the original openness of the platform and interpretation of the station building that has heritage significance
- The proposed entrance canopy and lift have been designed using simple geometric shapes with clean edges to partly blend with, and largely contrast with the traditional rectangular geometry of the station building and brick bridge piers
- The Proposal would use organic patterns and shiny surfaces in finishing the new elements. This would contrast with the muted colours and traditional finishes of the historic station elements.

The design is subject to change during the detailed design process.

3.2.4 Sustainability in design

The NSW Government aspires to provide a world class sustainable transport system that meets customer expectations and optimises the economic development of NSW. Transport is a key enabler of economic and social activity.

The Proposal has been developed and would be delivered in accordance with Transport's Sustainability Plan including Transport's vision - that every journey is people and planet positive.

Circular economy

In 2018-19 the construction sector was the second largest waste generating, generating 12.7 million tonnes of waste accounting for 16.8% of Australia's waste. Transport project delivery not only generates large amounts of construction waste but also consumes large amounts of raw materials.

A circular economy approach means shifting away from a 'take, make, use and dispose' approach to one that better values resources. This means using materials efficiently and keeping products and materials in use for as long as possible. Three key principles underpin a circular economy approach:

- designing out waste and pollution
- keeping products and materials in use
- regenerating natural systems.

The construction of the Proposal is anticipated to use large amounts of materials including but not limited to:

- concrete
- steel.

During operation the main circular economy impacts will relate to material use and disposal as a result of maintenance.

Response to circular design strategies

Adopting a circular economy approach results in economic, social and environmental benefits including reduction of emissions. Throughout the development of detailed design the Proposal would look to embed the circular design strategies outlined in Table 3-1.

Table 3-1: Circular design strategies

Circular design strategies	Definition	Proposal strategies
Design to maximise materials circularity and enable disassembly	Design using materials, products and connection systems that allow for easy re-use and recycling of materials, products and components at end of life. Design to allow an assembled structure or product to be taken apart without destroying its constituent materials or components.	Alterations made to the station building would involve minor demolition. The bricks obtained from this demolition may be reused in the Proposal. Alterations made to the platform facilities include re-location of seats. Seats would be retained from the original station where possible.
Design for materials efficiency	Materials efficiency means 'doing more with less' – this involves design and construction methods that use lower amounts of materials and reduce waste.	The Proposal may involve the use of sustainable materials, including: • cement with a higher recycled material content • steel sourced from a steelmaker that is a current member of the World Steel Climate Action Programme • recycled steel where practical • use of high quality and low maintenance materials. The Sustainability Management Plan would also outline the approach to identification of opportunities to reduce embodied lifecycle impacts of the Proposal.
Design for best practice operational waste management	Design to ensure that waste and recycling storage and collection systems maximise re-use and recycling and allow for ease of access by both users and waste service providers.	The bin on the platform may be relocated based on the locations of new accessible seating. This would allow for improved waste management practices for all users of the station.

Circular design strategies	Definition	Proposal strategies
Re-use existing assets or materials	Incorporate existing structures, products and materials on the project site into the new development.	The existing station building would be retrofitted to accommodate the Proposal. The existing heritage canopies would be retained and light poles may also be retained.
Select products with recycled content	Preference products that contain recycled content to keep materials circulating within the economy.	Where possible, recycled steel and concrete with a higher proportion of recycled content would be used for the Proposal.
Incorporate green infrastructure	Incorporate the network of green spaces, natural systems and semi-natural systems – including waterways, bushland, tree canopy, green walls and roofs, green ground cover, parks and open spaces – that support sustainable communities.	The Proposal would result in the removal of two trees on Hartill-Law Avenue. Offset calculations have determined that an additional eight trees would be required to be planted. If these trees cannot be provided in the Proposal area, the replacement trees may be purchased for Council tree planting initiatives across the LGA.

Sustainability issues and opportunities for the Proposal are discussed in Chapter 8.

3.3 Construction activities

3.3.1 Work methodology

The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with Transport.

The proposed construction activities for the Proposal are identified in Table 3-2. This staging is indicative and is based on the current concept design and may change once the detailed design and methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work. The staging and activities are often concurrent to increase efficiency and reduce impact on the community and construction timeframes.

Table 3-2: Indicative construction staging for key activities

Stage	Activities
Site establishment and enabling works	• establishment of site compounds (including erection of fencing, site office, amenities and plant and material storage areas) • carry out validation of the location of utilities • relocation of services and utilities as needed, and running, testing and commissioning of temporary service routes • installation of construction barriers, lighting and hoardings • temporary removal of up to 16 parking spaces within the Slade Road car park for the duration of the use of the site compound (refer to Section 6.1.3)

Stage	Activities
Decommissioning works	• installation of temporary platform access stairs on the eastern side of Hartill-Law Avenue, and subsequent decommissioning of the existing station entry stairs • decommissioning of existing non-heritage canopy at platform level connecting to the station building • decommissioning of light poles at platform levels as required
Substructure works	• piling works to support the new elevated walkway and lift shaft • excavations for lift shaft and platform canopy footings, light poles and any minor excavation for station furniture • construction of supports for the new stairs
New elevated walkway, stairs and lift	• construction of the new elevated walkway, including installation of the structural pier and horizontal beams • installation of the new lift, including: – formwork and reinforcement for lift pit and walls – steelwork for lift shaft and canopy roofing – lift car and motor – cladding and glazing for the lift shaft – lift finishing works, including mechanical and glass lift elements at street level • installation of new stairs and connection to the new elevated walkway • installation of protection and anti-throw screens along the new elevated walkway and stairs • installation of elevated walkway and stair canopy
Platform works	• temporary removal/reinstatement of platform furniture • resurface areas of the platform where impacted by construction activities, including services trenching works • regrade and resurface the platform, including installation of TGSIs to provide compliant accessible paths throughout the station • upgrade existing canopies to provide longer canopies near the new footbridge and at boarding assistance zones
Station building modifications	• install a temporary toilet on platform • demolish internal walls, fixtures, fittings and wall and floor finishes of existing male toilet in station building • installation of new dividing wall to create the family accessible toilet and unisex ambulant toilet • waterproofing and replacement of doors, tiles and trim to match existing heritage features • introduce new internal fixtures and fittings repurposing one female toilet to cleaner storage room • repurposing one female toilet to staff toilet

Stage	Activities
Station access and interchange works	• construction of the accessible parking space and kiss and ride space on Hartill-Law Avenue • kerb adjustments and footpath regrading works and isolated widening of footpath around an electrical pole along Hartill-Law Avenue • installation of tactile ground surface indicators at the bus stops at Hartill-Law Avenue • construction of a pedestrian crossing on Hartill-Law Avenue providing more direct access to the new kiss and ride and bus stop on the eastern side, including the removal of a portion of the crash barrier on the road over rail bridge • removal of two trees on Hartill-Law Avenue • creation of new foundation and installation of four bicycle hoops on Hartill-Law Avenue • permanent removal of three 15-minute timed council car parking spaces • reline-marking of one 15-minute council parking space on Hartill-Law Avenue • reconstruction of existing stormwater inlet pits and downpipes which discharge to the existing council stormwater infrastructure on Hartill-Law Avenue
Electrical upgrades	• earthing and bonding of electrical equipment and new or modified structures • upgrade to the station power supply • removal of the existing isolation transformer • installation of a new substation and isolation transformer adjacent to the location of the existing isolation transformer • carry out trenching for new cable routes • installation of a new metering board for the new isolation transformer at the property boundary to replace the existing metering located at the property boundary • installation of new lighting, including at the station entrance, along the new stairs, on new platform canopies and in the reconfigured toilets in the station building • potential lighting upgrade along Hartill-Law Avenue

Stage	Activities
Finishing works	• removal of any temporary supports for the new elevated walkway • installation of new utilities, including new cable routes, drainage infrastructure and cables for hearing augmentation and CCTV cameras • installation of placemaking enhancements including artwork/ heritage interpretation • reinstallation of platform furniture, including vending machines and opal card poles, help points and public payphone • commissioning of new assets, including the new lift • installation of signage and wayfinding • removal of temporary access stairs • tree replacement planting
Site demobilisation	• removal of the site office, temporary amenities, material laydowns, and plant and equipment storage areas • reinstatement of the Slade Road car park including line-markings, if required • verify that all finishing work has been completed • remove temporary safety barriers, lighting and hoarding.

3.3.2 Construction workforce

The number and type of workers would vary throughout the different stages of construction but would include workers such as:

- plant and machinery operators
- traffic controllers
- labourers
- utilities servicers
- project and site managers.

Outside of rail possession periods, an average of about 20 construction workforce staff are estimated to work on the Proposal per day. During rail possession periods, up to 50 construction workforce staff are expected to work on the Proposal during peak periods.

Final details of the workforce required for the Proposal would be identified during detailed design by the Contractor.

3.3.3 Construction hours and duration

Subject to approval, work is expected to commence in early 2025 and take around 18 months to complete. About six weekend rail shutdown periods would be required for construction.

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

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

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

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

- validation of utilities and services
- relocation of services and testing and commissioning of temporary service routes
- decommissioning of existing stairs
- construction of the new elevated walkway, stairs and the lift shaft (which would require the operation of cranes in the rail corridor)
- platform regrading and resurfacing
- electrical power supply upgrades
- commissioning work, including the removal of supporting infrastructure via a crane and the demobilisation of any equipment from the Proposal area at platform level.

Out of hours work may also be scheduled outside rail possession periods where required to reduce the impact on the wider community, road network (for example to facilitate oversized plant or material deliveries) or rail users. Approval from Transport would be required for any out of hours work and the affected community would be notified as outlined in Transport's Construction noise and vibration guideline (public transport infrastructure) (Transport for NSW, 2023a) (refer to Section 6.4 for further details).

The Contractor engaged to do the work may have an alternative construction methodology and may request access to weeknight rail possessions (which would indicatively run for around four nights from Monday night to Thursday night with working hours of around 11pm to 3am) to allow for preparation work prior to the weekend rail possessions.

3.3.4 Plant and equipment

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

- 15 tonne rough terrain cranes
- 55 tonne crawler cranes
- 70 tonne slew cranes
- 125 tonne slew cranes
- 450 tonne slew cranes
- chainsaws
- concrete pumps
- concrete trucks
- dump trucks
- elevated work platforms
- excavators
- glass handling lifts
- hand tools
- hydro vacuum trucks
- jackhammers
- lighting towers
- low loaders
- piling rigs
- rail trailers
- rigid trucks
- road sweepers
- semi-trailers
- skidsteer loaders
- suction trucks
- telescopic forklifts
- ventilation equipment
- vibrating rollers
- water carts.

Additional equipment that is likely to be used would be identified during detailed design by the Contractor.

3.3.5 Earthworks

Excavations and earthworks would generally be required for the following:

- excavation on the platform for the lift shaft
- excavation and piling works for the new canopies, elevated walkway and stairs
- upgrades to the footpath along Hartill-Law Avenue
- platform regrading
- other minor civil works including footings and foundations for structures, drainage / stormwater works, and trenching activities for service adjustments and relocations.

It is estimated that approximately 150 cubic metres of excavated material would be generated from the above activities. Excavated material would be reused onsite where possible or disposed of in accordance with relevant legislative requirements.

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

3.3.6 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 Transport Sustainable Design Guidelines – Version 4.0 (Transport for NSW, 2017). Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

3.3.7 Traffic management and access

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

- full and partial road closures of Hartill-Law Avenue may be required for various construction activities requiring the use of a crane, works to construct the pedestrian crossing and for other safety reasons throughout construction. This would include three weekend full road closures, which would likely be in effect from Saturday morning to Sunday evening. Appropriate detour routes and/or other traffic management arrangements would be implemented when roads are temporarily closed. Temporary road closures would result in a minor increase in travel time for vehicles travelling on a detour route.
- permanent removal of three 15-minute timed council car parking spaces on Hartill-Law Avenue
- temporary removal of up to 16 untimed car parking spaces within the existing Slade Road car park to facilitate a site compound
- temporary access to the station on the eastern side of Hartill-Law Avenue
- temporary closure of the pedestrian footpath on the western side of Hartill-Law Avenue in the vicinity of the existing station entrance to facilitate construction of the new elevated walkway, lift and stairs
- temporary pedestrian diversions around the station entry and footpath works along Hartill-Law Avenue
- construction traffic impacts from heavy and light vehicles, plant and equipment entering and leaving the site compound off Slade Road.

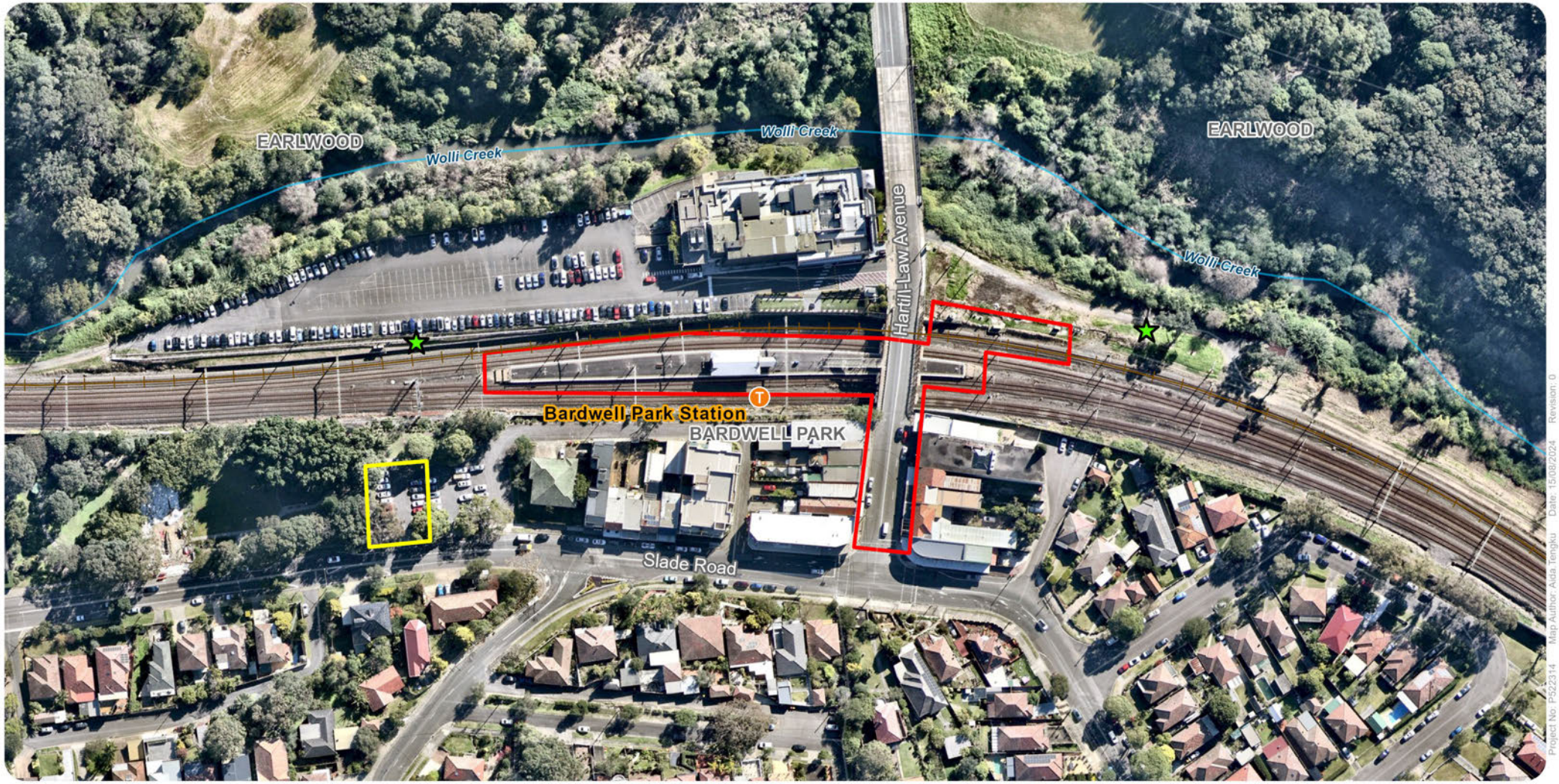
All roadwork would be undertaken on a progressive basis whilst ensuring minimal space and time is required to undertake particular phases of work. Traffic changes would be consulted with Bayside Council prior to construction.

3.4 Ancillary facilities

A temporary site compound would be required to accommodate a site office, amenities, laydown and storage area for materials and plant and equipment, and the like. The site compound is proposed to be located in the all-day (untimed) parking section of the Slade Road car park (refer to Figure 3-7), which would require temporary removal of up to 16 parking spaces for the duration of construction. The area nominated for the site compound is on land owned by Bayside Council. Impacts associated with using this area have been considered in this REF including requirements for site reinstatement. The location of the site compound would be subject to further consideration by the Contractor and may be adjusted to suit the Proposal's needs.

The station platform would also be used as a temporary laydown and spoil storage area for the duration of construction. Laydown and storage areas would be appropriately fenced off and would not inhibit customer access to the platform during the construction period. However, temporary hoarded construction areas and laydown and storage areas may limit patron movement on the platform. Furthermore, hi-rail access points would be used for hi-rail track plant and equipment to gain access to the track and traverse to the worksite during rail possession periods. The locations of existing access gates that could be used for the construction of Proposal are included in Figure 3-7.

Other worksite areas may be established during the course of the construction period and would be staged to minimise inconvenience to the customers and adjacent public areas. All established worksite areas would include suitable demarcation, hoarding or fencing. Landowners consent would be required for any proposed site compounds that are not on Transport owned land.



Source: Aurecon, TfNSW, NSW Spatial Services (DCS), ESRI

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Projection: GDA2020 MGA Zone 56

Figure 3-7: Proposed area and site compound location

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Project No: P522314 Map Author: Aida.Tengku Date: 15/08/2024 Revision: 0

3.5 Public utility adjustment

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 communications and electrical conduits and water and sewer services on the station platform; and Sydney Water services, high voltage and low voltage services (Ausgrid), and communications services (Telstra and Optus) located underneath the footpath on the station-side footpath of Hartill-Law Avenue. Utilities 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.

3.6 Property acquisition

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

3.7 Operation and maintenance

Operation and maintenance of Bardwell Park Station is the responsibility of Sydney Trains under an agreement with Transport Asset Holding Entity (TAHE). Sydney Trains also maintain assets on the road overbridge and related canopies extending beyond the boundaries of TAHE land. Sydney Trains and the Bayside Council have separate, formal agreements relating to maintenance of assets in the precinct based on asset type and geographical location. The Proposal would be carried out within the umbrella of current formal agreements between Sydney Trains and Bayside Council. Sydney Trains and Bayside Council are responsible for any negotiations or approvals relating to modifications of existing agreements.

4. Statutory and planning framework

This chapter provides the statutory and planning framework for the Proposal and considers the provisions of relevant state environmental planning policies, local environmental plans and other legislation.

4.1 Environmental Planning and Assessment Act 1979

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

In accordance with section 5.5 of the EP&A Act, Transport, 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.

Section 171 of the Environmental Planning and Assessment Regulation 2021 (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has or is likely to have a significant impact on the environment. Chapter 0 of the REF provides an environmental impact assessment of the Proposal in accordance with section 171 and Appendix A specifically responds to the factors for consideration under section 171.

4.1.1 State Environmental Planning Policies

State Environmental Planning Policy (Transport and Infrastructure) 2021

State Environmental Planning Policy (Transport and Infrastructure) 2021 (SEPP (Transport and Infrastructure)) aims to facilitate the effective delivery of infrastructure across the State.

Section 2.92 of SEPP (Transport and Infrastructure) permits development on any land for the purpose of a railway or railway infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the Proposal is for railway infrastructure facilities, comprising upgrades to a railway station, station platforms and areas in a station complex that commuters use to get access to the platforms, public amenities for commuters and associated public transport facilities for railway stations, and is to be carried out by Transport, it can assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (NSW). Development consent from council is not required.

The Proposal is not located on land reserved under the *National Parks and Wildlife Act 1974* and does not require development consent or approval under:

- State Environmental Planning Policy (Resilience and Hazards) 2021
- State Environmental Planning Policy (Planning Systems) 2021
- State Environmental Planning Policy (Precincts – Central River City)
- State Environmental Planning Policy (Precincts – Eastern Harbour City)
- State Environmental Planning Policy (Precincts – Regional) 2021
- State Environmental Planning Policy (Precincts – Western Parkland City) 2021.

Section 2.10 to 2.15 of SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local Councils and other public authorities prior to the commencement of certain types of development. Consultation, including consultation as required by SEPP (Transport and Infrastructure) (where applicable), is discussed in Chapter 5 of this REF.

State Environmental Planning Policy (Resilience and Hazards) 2021

Remediation of land

State Environmental Planning Policy (Resilience and Hazards) 2021 (SEPP (Resilience and Hazards)) 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 (Resilience and Hazards) have still been considered in the preparation of this REF.

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

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

Coastal management

Chapter 2 of the SEPP (Resilience and Hazards) aims to promote an integrated and co-ordinated approach to land use planning within the coastal zone in a manner consistent with the objects of the *Coastal Management Act 2016* (Coastal Management Act). The coastal zone is defined in the Coastal Management Act as being the area of land comprised of one or more of four coastal management areas:

- coastal wetlands and littoral rainforests area
- coastal vulnerability area
- coastal environment area
- coastal use area.

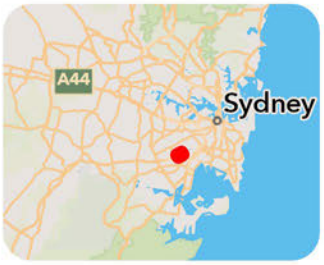
The Proposal is not located on any land identified as coastal wetlands, littoral rainforests, coastal environment or coastal use areas. However, a small northern portion of the Proposal area is located within the 'Proximity area for coastal wetlands' mapped in the SEPP (Resilience and Hazards) (refer to Figure 4-1). Section 2.8 of the SEPP (Resilience and Hazards) states that development consent must not be granted to development on land wholly or partly identified as "proximity area for coastal wetlands" unless the consent authority is satisfied that the proposed development would not impact on the biophysical, hydrological or ecological integrity of the adjacent coastal wetland or the quantity and quality of surface and ground water flows to the adjacent coastal wetland.

While this REF is being assessed under Division 5.1 of the EP&A Act and development consent is not required, as due diligence, Section 6 of the REF assesses the potential impacts from the Proposal and management measures are identified in Chapter 7 to mitigate potential impacts. This REF has identified that these impacts would not be significant.

Proposal area
Site compound
Train Station
Railway
Watercourse

SEPP Resilience and Hazards

Coastal Wetlands
Proximity Area for Coastal Wetlands



Source: Aurecon, TfNSW, NSW Spatial Services (DCS), ESRI

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Projection: GDA2020 MGA Zone 56

Figure 4-1: Coastal wetlands in proximity to the Proposal

4.1.2 Local Environmental Plans

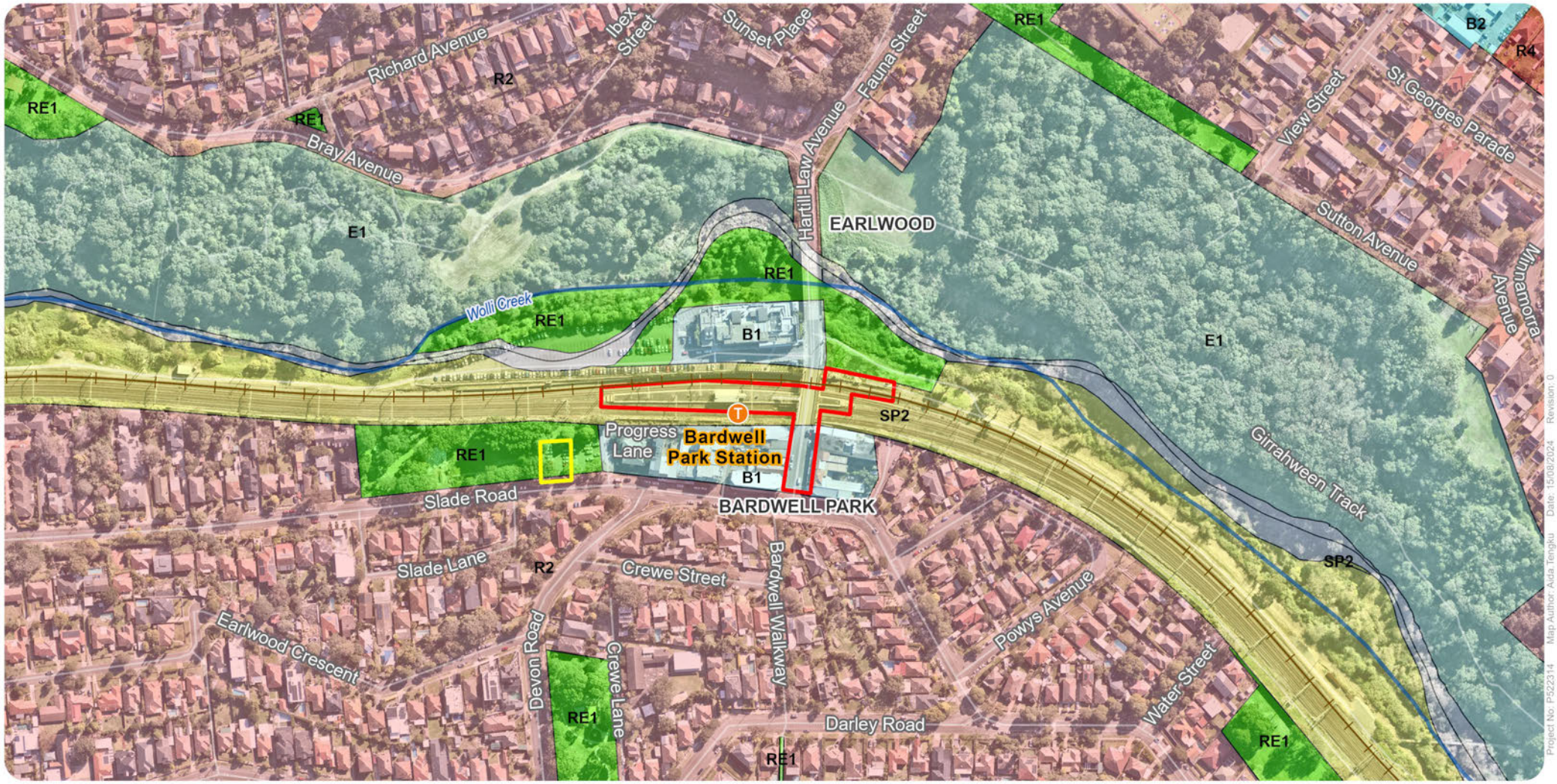
Bayside Local Environmental Plan 2021

The Proposal is located within the Bayside local government area (LGA). The SEPP (Transport and Infrastructure) prevails over all other environmental planning instruments (such as LEPs) except where there is an inconsistency with State Environmental Planning Policy (Precincts) 2021 or certain provisions of SEPP (Resilience and Hazards). During the preparation of this REF, the provisions of Bayside Local Environmental Plan 2021 (Bayside LEP) were considered (refer Table 4-1).

Table 4-1: Relevant provisions of the Bayside LEP

Provision description	Relevance to the Proposal
Clause 2.3 – Zone objectives and Land Use Table	Under the Bayside LEP: • The rail corridor is on land zoned as SP2 Infrastructure – Rail Infrastructure Facility. The Proposal is consistent with the objectives of this land use zone as it provides for infrastructure and related uses. • EBP RSL to the north of the Proposal is mapped as B1 Local Centre and the Bardwell Park town centre and shopping village mapped as B1 Local Centre. The Proposal is consistent with the objectives of these land use zones as it would maximise public transport patronage through accessibility upgrades, allowing customers to use Bardwell Park Station more easily. Land zoning within and surrounding the Proposal area is mapped in Figure 4-2.
Clause 5.10 – Heritage Conservation	Clause 5.10 of the Bayside LEP aims to conserve the environmental heritage of the Bayside LGA, the significance of heritage items and heritage conservation areas (including fabric, settings and views), archaeological sites, Aboriginal objects and Aboriginal places of heritage significance. Bardwell Park Railway Station Group or other surrounding heritage items are not listed in Schedule 5 of the Bayside LEP and would not be impacted by the Proposal. Bardwell Park Railway Station Group is listed on the TAHE Section 170 Heritage and Conservation Register (#4801896). The potential impacts to the heritage curtilage of the station are considered in Section 6.5.
Clause 5.21 – Flood planning	Clause 5.21 of the Bayside LEP aims to minimise the flood risk to life and property associated with the use of land, allow development on land that is compatible with the flood function and behaviour on the land, taking into account projected changes as a result of climate change, avoid adverse or cumulative impacts on flood behaviour and the environment and to enable the safe occupation and efficient evacuation of people in the event of a flood. A desktop hydrology study has been undertaken to identify the existing flood behaviour as well as potential impacts of the concept design at Bardwell Park Station (refer to Section 6 of this REF). The study found that with the existing infrastructure, the platform would not be inundated during 1% AEP flood events. However, the surrounding railway tracks are subjected to riverine flooding from Wolli Creek as well as the local runoff. The Proposal is not anticipated to increase the flooding potential within the station, however, additional mitigation measures would be explored during detailed design to protect station equipment and facilities against flood damage, as well as minimise runoff.

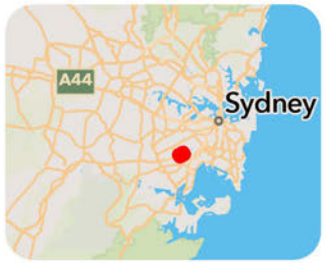
Provision description	Relevance to the Proposal
Clause 6.1 – Acid Sulfate Soils	Clause 6.1 of the Bayside LEP aims to ensure that development does not disturb, expose or drain acid sulfate soils and cause environmental damage. Bardwell Park Station is on land mapped as Class 5 acid sulfate soils i.e. works within 500 metres of adjacent Class 1, 2, 3 or 4 land that is below 5 metres Australian Height Datum and by which the water table is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land. In addition, land with this classification typically requires development consent, however, under Section 2.9.2 of the SEPP (Transport and Infrastructure), the Proposal is permissible without development consent and would be authorised under Division 5.1 of the EP&A. Section 6.8 provides a discussion on potential impacts on contamination, landform, geology and soils associated with the Proposal, including consideration of measures to minimise potential impacts associated with acid sulfate soils.
Clause 6.2 – Earthworks	Clause 6.2 of the Bayside LEP aims to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land. Under Section 2.9.2 of the SEPP (Transport and Infrastructure), the Proposal is permissible without development consent. Consideration of the potential impacts is outlined in Section 6.8 and appropriate mitigation measures outlined in Section 7.2.
Clause 6.3 Stormwater and water sensitive urban design	Clause 6.3 of the Bayside LEP aims to avoid or minimise the adverse impacts of urban stormwater on the land which development is to be carried out, adjoining properties, native bushland, waterways, receiving waters and groundwater systems. Before granting development consent to land which this LEP applies, the consent authority would need to be satisfied that the design has incorporated: • water sensitive urban design principles • riparian, stormwater and flooding measures • all reasonable management actions to avoid, minimise and mitigate adverse impacts on the land to which the development is to be carried out • maximal use of water permeable surfaces on the site having regard to the soil characteristics affecting on-site infiltration of water. Under Section 2.9.2 of the SEPP (Transport and Infrastructure), the Proposal is permissible without development consent. However, the above principles would be considered further as part of stormwater and drainage design during the detailed design stage.



Proposal area
Site compound
Train Station
Railway
Watercourse

Land Zoning

B1 - Neighbourhood Centre
B2 - Local Centre
E1 - National Parks and Nature Reserves
R2 - Low Density Residential
R4 High Density Residential
RE1 - Public Recreation
SP2 - Infrastructure
UL - Unzoned Land



Source: Aurecon, TfNSW, NSW Spatial Services (DCS), ESRI

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Projection: GDA2020 MGA Zone 56

Figure 4-2 Land zoning

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Project No: P522314 Map Author: Aida Tengku Date: 15/08/2024 Revision: 0

4.2 Other relevant NSW legislation

4.2.1 Transport Administration Act 1988

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

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

2A Objects of Act

...

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

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

...

a. ***Environmental sustainability***

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

b. ***Social benefits***

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

4.2.2 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) is directed at conserving threatened species, populations and ecological communities of animals and plants. The BC Act outlines the framework for addressing impacts on biodiversity from development and clearing.

The Proposal would require the removal of two native trees which are associated with the key threatening process 'clearing of native vegetation' under the BC Act. However, as the Proposal is limited to removing two native trees which are amenity plantings, the Proposal would not cause this flora species to become threatened (as defined under the BC Act).

Refer to Section 6.7 for more information on potential impacts to biodiversity from the construction and operation of the Proposal.

4.2.3 Heritage Act 1977

The *Heritage Act 1977* (Heritage Act) aims to protect items of State and local heritage significance and outlines the process for the approval of development that may impact on items of heritage significance. The Heritage Act includes requirements for approval for impacts to items listed on the State Heritage Register and disturbance of relics, as well as notification of demolition of items listed on a State Agency's Section 170 heritage and conservation register.

Section 170 (a) of the Act states that for any work which may have an impact upon items (ie. demolition, vacating or change of use) listed on a Section 170 heritage and conservation register maintained by a government agency, notification to Heritage NSW may be required. Bardwell Park Station is listed on the TAHE Section 170 Heritage and Conservation Register (#4801896). Impacts to Bardwell Park Railway Station Group as a result of the Proposal are included in Section 6.5.

4.2.4 Protection of the Environment Operations Act 1997

The Proposal does not involve a 'scheduled activity' under Schedule 1 of the *Protection of the Environment Operations Act 1997* (POEO Act). Accordingly, an Environment Protection Licence is not required for the Proposal. However, in accordance with Part 5.7 of the POEO Act, Transport would notify the EPA of any pollution incidents that occur onsite. This would be managed through the Construction Environmental Management Plan (CEMP) to be prepared and implemented by the Contractor.

4.2.5 Roads Act 1993

Section 138 of the *Roads Act 1993* (the Roads Act) requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require approval for works on unclassified roads. The Proposal involves work on Hartill-Law Avenue which is a regional road under the control of the Bayside Council. A Road Occupancy Licence/s would be obtained from the relevant roads authority for road work and any temporary road closures where required (see Section 6.1 for more information).

4.2.6 Waste Avoidance and Resource Recovery Act 2001

The *Waste Avoidance and Resource Recovery Act 2001* (WARR Act) sets out provisions for resource and waste management. Transport would carry out the Proposal following the requirements of the WARR Act, this includes a site-specific Waste Management Plan being prepared.

4.3 Commonwealth legislation

4.3.1 Environment Protection and Biodiversity Conservation Act 1999

Under the EPBC Act, a referral is required to the Australian Government for proposed actions that have the potential to significantly impact on matters of national environmental significance or the environment of Commonwealth land. These are considered in Chapter 6 of this REF.

Potential impacts to these biodiversity matters are also considered as part of Chapter 6 of the REF.

Findings – matters of national environmental significance

The assessment of the Proposal's impact, on matters of national environmental significance and the environment of Commonwealth land, found that there is unlikely to be a significant impact on relevant matters of national environmental significance or on Commonwealth land. Accordingly, the Proposal has not been referred to the Australian Government Department of Climate Change, Energy, the Environment and Water under the EPBC Act.

4.3.2 Other relevant Commonwealth legislation

Other Commonwealth legislation applicable to the Proposal is discussed in Table 4-2 below:

Table 4-2: Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	There is an obligation on a person who discovers anything which they have reasonable grounds to suspect are Aboriginal remains, to report that discovery to the Minister, giving particulars of the remains and their location. An AHIMS search was undertaken on 13 March 2024 which identified four registered Aboriginal heritage sites and/or places within 200 metres of the Proposal area. However, these items would not be impacted by the Proposal as identified by the outcomes of the Stage 1 Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) assessment letter (refer Section 6.4). Considerations for unexpected finds are further detailed in mitigation measures and applies to this Act.
Disability Discrimination Act 1992 (DDA)	This Act aims to eliminate as far as possible, discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land. The Proposal would be designed having regard to the requirements of this Act. The key objective of the Proposal is to improve the accessibility of Bardwell Park Station which is consistent with the objectives of this Act.

4.3.3 Native Title Act 1993

The *Native Title Act 1993* recognises and protects native title. The Act covers actions affecting native title and the processes for determining whether native title exists and compensation for actions affective native title. It establishes the Native Title Registrar, the National Native Title Tribunal, the Register of Native Title Claims and the Register of Indigenous Land Use Agreements, and the National Native Title Register. Under the Act, a future act includes proposed public infrastructure on land or waters that affects native title rights or interest.

A search of the Native Title Tribunal Native Title Vision website was undertaken on 13 March 2024 with no Native Title holders/claimants identified.

4.4 Confirmation of statutory position

The Proposal is categorised as development for the purpose of railway infrastructure facilities and is being carried out by or on behalf of a public authority. Under section 2.92 of SEPP (Transport and Infrastructure) the Proposal is permissible without consent. The Proposal is not State significant infrastructure or State significant development. The Proposal can be assessed under Division 5.1 of the EP&A Act.

Transport is the determining authority for the Proposal. This REF fulfils Transport's obligation under section 5.5 of the EP&A Act including to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the activity.

5. Consultation

This chapter discusses the consultation undertaken to date for the Proposal and the consultation proposed for the future.

5.1 Consultation strategy

The community and stakeholder engagement (consultation) strategy developed to support the Proposal was prepared to foster authentic stakeholder and community relationships.

The objective of the Community and Stakeholder Engagement Strategy is to identify a broad range of stakeholders and optimal timing to engage with each stakeholder group during project development to ensure best project outcomes. Engagement on the Proposal spans from the initial early engagement period prior to development of a concept design, through to targeted engagement to seek feedback from key stakeholders, to the wider community engagement periods.

The consultation strategy that was developed, having regard to the requirements of the planning process ensures that a broad range of stakeholders including Aboriginal and Torres Strait Islander communities, local people with disability, women and girls, public transport passengers, Council, local businesses and schools, and the wider community are informed of the Proposal and have the opportunity to provide feedback at appropriate times.

The objectives of the community and stakeholder engagement (consultation) strategy are to:

- identify broad stakeholder groups and specific stakeholders to engage with
- identify at which stages engagement with each group is appropriate to facilitate implementation of feedback in project design
- ensure engagement is planned and undertaken with disability user groups and local people with disability, as well as local women and girls, to make stations more useable and safer for people with a disability and women to use
- provide accurate and timely information about the Proposal and planning approval 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 Proposal, the planning approval process and opportunities to provide feedback throughout the project design process
- provide opportunities for stakeholders and the community to express their view, and provide local insights and knowledge which may affect the Proposal
- record the details and input from community engagement activities
- build positive relations with identified community stakeholders
- ensure a comprehensive and transparent approach with a commitment to ongoing engagement throughout the project design and delivery.

5.2 Community engagement

Before preparing the concept design for Bardwell Park Station, Transport engaged with various groups including people with disability, Aboriginal and Torres Strait Islander peoples and women and girls from the local community. These engagements have included engagement with local women and girls to better understand perceptions of safety at and around the station, and collaborative Connecting with Country events to understand the unique and enduring relationship between Aboriginal and Torres Strait Islander peoples and their ancestral lands, waters and natural resources. The main elements that were incorporated into the concept design following these engagements include:

- identification of initiatives such as materials, landscaping design and artwork that recognise the area's rich Aboriginal culture and heritage
- initiatives to improve perceptions of safety at night around the station precinct such as improvements to lighting
- better amenities such as seating, landscaping and improved wayfinding signage.

Initial feedback on concept designs was sought from the community and key stakeholders including Council and local people with disability from 28 April to 27 May 2024. The project received more than 70 pieces of feedback during this early engagement period.

The feedback received from the community and key stakeholders was provided to the project team for consideration and to help inform the planning process and documentation. A summary of the issues raised by the community, and Transport's response to these issues, is outlined in Table 5-1.

Table 5-1: Summary of issues raised by the community

Group	Issue raised	Response / where addressed in REF
Community	Suggestions to adjust arrangements on Hartill-Law Avenue to improve bus and vehicle thoroughfare, requests to retain timed parking where possible.	Transport would work with Council during the detailed design phase to determine opportunities to improve bus and vehicle thoroughfare, as well as finding suitable locations for the proposed accessible parking and kiss and ride spots. Transport however notes that there would likely be an impact on the existing timed parking spots in order to achieve these improvements. Any parking changes would be referred to Bayside Traffic Committee for endorsement and approved by Council.
	Preference to remove the pedestrian crossing from Hartill-Law Avenue as it would impact traffic.	A large quantity of feedback was received regarding impacts on traffic as a result of a proposed pedestrian crossing on Hartill-Law Avenue. The REF assessments were completed on the concept design, which included the pedestrian crossing. Transport is committed to investigating other opportunities to connect the new accessible kiss and ride space with the station entry. This would be explored in greater detail during the detailed design process, with a view to minimise potential impacts to the community. Any traffic treatment would be referred to Bayside Traffic Committee for endorsement and approved by Council.

Group	Issue raised	Response / where addressed in REF
	Requests to provide additional kiss and ride spaces near the station entry during peak times.	Transport would work closely with Council to determine how to minimise impacts on timed parking, and to investigate provision of additional kiss and ride spaces near the station. Any parking changes would be referred to Bayside Traffic Committee for endorsement and approved by Council.
	Support for additional canopy coverage on the station platform and suggestion for additional seating.	The concept design as assessed within this REF depicts reduced canopies from what was shown during the early engagement stage. Transport would explore options during detailed design to increase canopy coverage, however the extent is subject to existing structural constraints as well as heritage considerations.
	Suggestion to provide additional accessible station entry point from the RSL commuter car park and/or the Slade Road car park.	Provision of an additional accessible station entry point is not within the scope of this project. Creation of an additional accessible station entry point would have a significant construction cost, and would impact station operation. During the early planning stage, Transport undertook modelling of future predicted patronage volumes, which show a slight increase from current. It was determined that the current single entry point would have provide sufficient capacity for these volumes.
	Concerns about driver safety and limited sight lines when exiting the Commuter car park, as well as pedestrian safety when accessing the commuter spaces within the RSL car park due to poor visibility for drivers.	Noted. While upgrading access to this car park is out of the project scope, Transport would work with Council and EBP RSL to explore opportunities to enhance safety for passengers accessing the accessible spaces in commuter car park.
Local people with disability and carers	Need for clearer signage to highlight amenities for people with disability e.g., location of boarding assistance zone, toilets and where T-switch hearing services are available.	Noted. This feedback has been shared with Transport's wayfinding team, and additional wayfinding and signage would be investigated during the detailed design stage.
	Request for descriptive labels next to lift buttons across the network to reduce mental load on passengers e.g. name of street or platform number	As above. This feedback will also be issued to the relevant teams in Transport for consideration across the wider train network.

Group	Issue raised	Response / where addressed in REF
	Preference for glass/transparent material to be used for lift shafts to increase passive surveillance e.g., if a lift becomes stuck, a deaf person who is unable to hear messages can more easily get the attention of other passengers. Transparent materials enhance the feeling of safety as assaults are less likely to occur with passive surveillance	Noted, material selection would be considered during detailed design stage.
	Consider spreading out opal poles to reduce the sense of chaos some passengers with hidden disabilities may feel during busy periods.	As above, this would be considered in the detailed design stage. This feedback will be issued to the relevant teams in Transport for feedback and consideration across the network.
	Request for safety improvements from the EBP commuter car park and the station entry. Accessible spaces within this car park don't have an accessible path of travel, and passengers with varying disability ie deafness aren't able to use other senses to predict pedestrian/vehicle conflicts.	Transport would work with Council and EBP RSL to explore opportunities to enhance safety for passengers accessing the accessible spaces in commuter car park.
	Request for more accessible parking spaces	Transport would work with Council to explore opportunities to include additional accessible parking spaces near the station entry.

5.3 Aboriginal community engagement

Transport engaged with Aboriginal and Torres Strait Islander peoples by undertaking collaborative Connecting with Country events to understand the unique and enduring relationship between Aboriginal and Torres Strait Islander peoples and their ancestral lands, waters and natural resources.

Engagement and consultation with Aboriginal stakeholders was undertaken between January 2023 and February 2023 via emails, phone calls and Walks on Country. Consultation has included representatives from the Metropolitan LALC and Wangal Community Elders. A summary of issues raised during consultation and where this has been addressed in the REF are included in Table 5-2.

Following engagement, a Connecting with Country Framework was developed which includes recommendations for future engagement to ensure that the concept design would align with the principles and guidelines of the GANSW draft Connecting with Country Framework (DPIE, 2020) and associated best practice documents.

Recommendations from the framework document are summarised below:

- considering the Design Principles within the design stages for the Proposal
- actioning appropriate recommendations from the Statements of Commitment
- facilitating ongoing Aboriginal consultation with the stakeholders during subsequent key development stages of the Proposal
- integrating meaningful, co-designed interpretation/artwork/landscape elements within the design development stages of the Proposal, through the development of Heritage Interpretation Strategies that require consultation with key stakeholders
- arranging Cultural Awareness Training for Proposal team members
- updating Aboriginal stakeholders on the progress of the Proposal.

Table 5-2: Issues raised through Aboriginal community consultation

Group	Issue raised	Response / where addressed in REF
LALC	Importance of sustainability and respecting the natural environment	The Proposal has integrated sustainability principles as part of the design and throughout construction (see Sections 3.2.4 and 8). Impacts to the natural environment have been minimised through the design options selection process as well as design refinement process. This has resulted in only two native trees requiring removal (see Section 2.4 and 6.7).
	Listening to Aboriginal knowledge about the health of water	The Proposal would consider the interpretation of Wolli Creek in draft Bardwell Park Heritage Interpretation Strategy (Artefact 2023). The Proposal would continue to consult and engage with Aboriginal stakeholders and groups through the Connecting with Country Framework.
	Being included in decision making and feeling recognised and heard	The Proposal would continue to consult and engage with Aboriginal stakeholders and groups, including MLALC, Elders and people with knowledge of Country through the Connecting with Country Framework. Consultation would continue throughout the design and construction process.
	Acknowledgement of Aboriginal people can be through dual naming, ongoing consultation, recognition in artworks and interpretation, and cultural safety	Through the design process, the Proposal would ensure that Aboriginal languages are used. Transport would engage an Aboriginal language holder to advise on the Wangal dialect or Darug language use in station signage, artwork and announcements.
Wangal Elder	Importance of cultural safety to local Aboriginal communities and young people in particular	The Proposal would continue to consult and engage with Aboriginal stakeholders and groups through the Connecting with Country Framework. The art narrative and development of heritage interpretation strategies would be further developed in during the detailed design phase.

Transport has also undertaken a Stage 1 Aboriginal heritage assessment for the Proposal in line with the Procedure for Aboriginal Cultural Heritage Consultation and Investigations (PACHCI) (Transport, 2011). The stages of PACHCI are outlined in Table 5-3.

Table 5-3: Summary of Transport's Procedure for Aboriginal Cultural Heritage Consultation and Investigation

Stage	Description
Stage 1	Initial assessment by Transport.
Stage 2	Site survey and further assessment.
Stage 3	Formal consultation and preparation of a cultural heritage assessment report.
Stage 4	Implement environmental impact assessment recommendations.

The Stage 1 assessment concluded that the Proposal is unlikely to have an impact on Aboriginal cultural heritage. As such, the remaining stages of the procedure are not required.

5.4 SEPP (Transport and Infrastructure) consultation

Part 2, Division 1 of SEPP (Transport and Infrastructure) contains provisions for public authorities to consult with local Councils and other public authorities prior to the commencement of certain types of development. Sections 2.10 to 2.17 of SEPP (Transport and Infrastructure) require that public authorities undertake consultation with Councils and other agencies, when proposing to carry out development without consent.

Bayside Council would be consulted about the Proposal as per the requirements of section 2.10 of SEPP (Transport and Infrastructure). Appendix B - Statutory consultation checklists contains a SEPP (Transport and Infrastructure) consultation checklist that documents how SEPP (Transport and Infrastructure) consultation requirements have been considered.

Issues raised from this consultation and how they have been addressed for the Proposal would be outlined in the Determination Report prepared for the Proposal.

5.5 Ongoing or future consultation

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

Should Transport determine to proceed with the Proposal, the Determination Report would be made available on the Transport website and would summarise the key impacts identified in this REF, demonstrate how Transport 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 determine to proceed with the Proposal, the project team would keep the community, public transport passengers, Councils and other key stakeholders informed of the process, identify any further issues as they arise, and develop additional mitigation measures to minimise the impacts of the Proposal. The interaction with the community would be undertaken in accordance with a Community Liaison Management Plan to be developed prior to the commencement of construction.

6. Environmental assessment

This section of the REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the Proposal. All aspects of the environment, potentially impacted upon by the Proposal, are considered. This includes consideration of:

- Potential impacts on matters of national environmental significance under the EPBC Act.
- The factors specified in the Guideline for Division 5.1 assessments (DPE 2022) and as required under section 171 of the Environmental Planning and Assessment Regulation 2021. The factors specified in section 171 of the Environmental Planning and Assessment Regulation 2021 are also considered in Appendix A.

Site-specific mitigation measures are provided to mitigate the identified potential impacts.

6.1 Traffic and transport

6.1.1 Methodology

The potential traffic and transport impacts during construction and operation of the Proposal have been assessed as part of the Traffic, Transport and Access Impact Assessment (Aurecon, 2024). This involved qualitatively assessing potential impacts on the road, public transport and active transport during construction and operation of the Proposal through:

- reviewing available traffic data, existing and future land uses, crash data and public transport information
- identification of potential vehicle generating activities and preparing trip generation forecasts for construction vehicles
- assessing construction traffic and impacts on pedestrians, cyclists, public transport and the local road network and access
- identification of mitigation measures to alleviate identified traffic, transport and access impacts associated with the construction and operation of the Proposal.

Given the minor nature of traffic anticipated to be generated from the Proposal, operational modelling was not carried out.

6.1.2 Existing environment

Bardwell Park Station is accessed from Hartill-Law Avenue. Other key roads surrounding the station include Slade Road, Progress Lane, Bray Avenue, Homer Street, William Street and M5 South-West Motorway. A summary of key roads surrounding the station is included in Table 6-1.

Table 6-1 Summary of key roads surrounding the Proposal area

Road	Description
Hartill-Law Avenue	Hartill-Law Avenue is a regional road that runs in a north-south direction. At its northern extent, it terminates at the intersection with William Street and Homer Street, and at the southern extent it terminates at the intersection with Slade Road. It is a two-way road with one lane in each direction and has a posted speed limit of 50 kilometres per hour. Within the Proposal area, Hartill-Law Avenue intersects with the following roads: • William Street, a signal-controlled intersection with all vehicular turning movements permitted. • Homer Street, a signal-controlled intersection with all vehicular turning movements permitted. • Slade Road, a signal-controlled intersection with all vehicular turning movements permitted. • Bray Avenue, a priority-controlled (give-way) intersection with all vehicular turning movements permitted. • Fauna Street, a priority-controlled (give-way) intersection with all vehicular turning movements permitted.
Slade Road	Slade Road runs in an east-west alignment and intersects with Hartill-Law Avenue at a signal-controlled intersection. From the Slade Road / Hartill-Law Avenue intersection, the western leg is classified as a regional road and the eastern leg is a local road. It is a two-way road with one lane in each direction and has a posted speed limit of 50 kilometres per hour.
Progress Lane	Progress Lane is a two-way local road which loops around and intersects with Slade Road. There is no parking allowed on Progress Lane, however, there is unrestricted and 2P off-street parking provided within Slade Road car park on the corner of Slade Road and Progress Lane. There is a closed laneway which normally provides pedestrian connectivity between Progress Lane and Hartill-Law Avenue. This lane provides access to residential car parking spaces and commercial driveways.
Bray Avenue	Bray Avenue is a local road which runs in an east-west alignment. At its eastern extent, it terminates at the intersection with Hartill-Law Avenue, and at its western extent, it terminates at the intersection with Wolli Avenue. It is a two-way road with one lane in each direction and has a posted speed limit of 50 kilometres per hour. There is unrestricted on-street parking along the road.
Homer Street	Homer Street runs in an east-west alignment. From the Homer Street / William Street / Hartill-Law Avenue intersection, the western leg is classified as a local road and the eastern leg is a regional road. From the Homer Street / William Street / Hartill-Law Avenue intersection, the western leg is a two-way road with one lane in each direction, while the eastern leg is a two-way road with two lanes in each direction. Homer Street has a posted speed limit of 50 kilometres per hour. A school zone speed limit of 40 kilometres per hour applies on Homer Street in the vicinity of Earlwood Public School.
William Street	William Street is a regional road which runs in an east-west alignment. At its eastern extent, it terminates at the intersection with Homer Street and Hartill-Law Avenue, and at its western extent, it terminates at an intersection with Kingsgrove Road and Forsyth Street. It is a two-way road with one lane in each direction and has a posted speed limit of 50 kilometres per hour.
M5 South-West Motorway	The M5 Motorway is a state road which runs in an east-west alignment, providing traffic-light free travel from Beverly Hills to Prestons. The M5 is the nearest motorway to Bardwell Park Station which can be accessed via Bexley Road. The motorway connects with major roads like the F5 Freeway, M5 East, and Westlink M7.

Public transport

Bardwell Park Station is located on the T8 Airport and South Line. The station has two platforms with Platform 1 services running to Central Station and the City Circle via the Airport and Platform 2 running services to Revesby. Services travelling in both directions have a frequency of 15 minutes.

Bus stops are located to the south of the station on both sides of Hartill-Law Avenue. There are several bus services, including school bus services, that operate in the vicinity of the station. These bus services provide connectivity to destinations within Bayside and Canterbury-Bankstown LGAs and between Georges River LGA to Canada Bay LGA via the Inner West LGA. Bus routes that stop at Bardwell Park Station include:

- 446 - St George Hospital to Roselands
- 473 - Rockdale to Campsie
- 491 - Hurstville to Five Dock
- 720S - St George Girls High School to Campsie Station
- S123 - St George Hospital to All Saints Grammar School
- S129 - All Saints Junior School to Bexley North.

Taxi zones

There are no existing taxi zones provided at Bardwell Park Station or in the surrounding areas.

Active transport

Pedestrian footpaths are provided on all roads leading to Bardwell Park Station.

There are no cycling lanes or bicycle hoops on Hartill-Law Avenue. Bicycle users currently leave bicycles secured to the existing fence along Hartill-Law Avenue. However, there are on-road paths along William Street, Homer Street and Darley Road which connect to cycling routes that extend north towards Earlwood, south-east towards Bardwell Valley and south-west towards Bexley North.

Parking

Bardwell Park Station has a commuter car park that is shared with the adjacent EBP RSL car park. There are about 120 car parking spaces within this car park allocated for transport commuters. There is limited 15-minute on-street parking (five car parking spaces) along the southern extent of Hartill-Law Avenue on both sides of the road.

On the broader network, there is a moderate amount of vehicle parking available. There is a car park (Slade Road car park) to the eastern side of Slade Road Reserve (about a three-minute walk from the station) which has unrestricted parking with 23 car spaces and two-hour parking with 20 car spaces.

There is unrestricted on-street parking on both sides of the road along Bray Avenue, Powys Avenue, Slade Road between Powys Avenue and to the west of the Slade Road / Slade Lane (east) intersection.

6.1.3 Potential impacts

Construction

Construction traffic and access

Outside rail possession periods, an average of about 20 construction workers are expected per day. During rail possession periods, up to 50 construction workers are expected during peak periods. A worst-case scenario of all construction staff travelling to and from the station by private vehicles has been assumed for a conservative assessment. This equates to:

- 40 light vehicle trips per day during periods outside of rail possessions
- 100 light vehicle trips per day during rail possession periods.

These vehicle movements are anticipated to occur outside of the road network peak periods i.e. AM and PM peak periods, meaning these are not anticipated to have impacts on the performance of the road network. Other vehicle movements as part of the construction of the Proposal would include:

- up to 10 light vehicle two-way trips per day for site management and inspections
- up to 20 heavy vehicle two-way trips per day for the movement of site material and drop off of supplies
- up to 10 two-way trips throughout the construction period for the movement of construction plant and equipment such as mobile cranes
- up to 28 heavy vehicle two-way trips throughout the construction phase for the transportation of construction waste.

Designated access routes for heavy vehicle movements would be via regional and State roads where practical. It is anticipated that most heavy vehicle traffic generated during the construction phase would be vehicles up to a 19 metre B-double, meaning no road upgrades would be required (subject to a detailed route survey).

Temporary traffic management would be implemented for the transportation of mobile cranes and other bulky items. This would only be required occasionally. Indicative haulage routes to and from the station are outlined in the Traffic, Transport and Access Impact Assessment (Aurecon, 2024).

Three temporary, full weekend closures of Hartill-Law Avenue (overbridge section of the road) would likely be required to facilitate crane lifts to remove existing structures and install new infrastructure, and also for other work near the road. Local traffic detours would be required to cross over the rail line when this work is being carried out. Two detour routes expected as a result of closures include:

- Route 1: Detour via Slade Road, Bexley Road, Homer Street Shaw Avenue, Wolli Avenue and Bray Avenue
- Route 2: Detour via Slade Road, Darley Road, Bardwell Road, John Street, Wentworth Road, Dowling Street, Wollongong Road, Allen Street, Princes Highway, Gannon Street, Unwins Bridge Road, Richardsons Crescent, Bayview Avenue and Homer Street.

Route 1 would increase vehicle travel times by about seven minutes and Route 2, being the longer route would increase vehicle travel times by about 18 minutes. However, it is expected that Route 1 would experience a higher detour utilisation due to it being a more direct detour route. Overall, the full and partial road closures on Hartill-Law Avenue are expected to have moderate impacts on the road traffic.

Potential detour routes and indicative additional travel times are shown in Figure 6-1.

There would also be some mid-week temporary partial road closures on Hartill-Law Avenue to facilitate work within the road reserve. These partial road closures would only close a portion of the road or a particular lane, while allowing access to at least one trafficable lane. During these

closures, it is anticipated the full and partial closures on Hartill-Law Avenue would have moderate impacts on the road traffic. Appropriate detour routes and/or other traffic management arrangements would be implemented when these roads are temporarily partially closed.

Short-term delays are anticipated to local road traffic on Slade Road from vehicles entering and exiting the site compound. However, these delays are not expected to put additional strain on the road network.

Vehicles would likely use Slade Road and Hartill-Law Avenue to move materials between the site compound and the two existing access gates. This is anticipated to cause short-term, localised traffic delays. However, the impact is anticipated to be minor as vehicles would only need to travel short distances i.e. less than 430 metres between the site compound and the access gates, traffic vehicle movements would occur outside of the road network peak periods. The scheduling of moving larger construction items would be limited during rail possessions and during full road closures. Progress Lane located adjacent to the Slade Road car park would be discouraged from being used.

Vehicle trips generated by construction waste disposal and SPV would be low in volume are not expected to occur throughout the entirety of the construction period as they are more likely to occur during the early phases of construction. Overall, the low volume of additional vehicle trips generated by construction waste disposal, are not expected to have any impacts on the performance of the road network.

Emergency vehicle access would not be impeded during the construction phase. During construction, the Contractor would notify emergency services with any changes to access for emergency vehicles. The Contractor would also consult with local authorities and emergency services to determine priority access routes for areas within and surrounding the Proposal area.

Figure 6-1: Nearby roads and indicative detour routes during road closure periods

Parking

The establishment of a site compound in the Slade Road car park, south-west of the Proposal site would temporarily remove up to 16 untimed council parking spaces for the duration of the use of the site compound. These parking spaces generally have a high utilisation due the spaces being all-day parking spaces. The Proposal also requires the permanent removal of three 15-minute timed council car parking spaces on the southern extent of Hartill-Law Avenue to accommodate the construction of one new accessible car space and the relocation of the existing bus zones. This impact would commence during construction and would become permanent in operation.

Therefore, the overall impact to parking may be 19 car parking spaces temporarily removed for the duration of construction.

During rail possessions (and a day prior to rail possession periods), about three commuter parking spaces would temporarily be removed to facilitate access to the rail corridor access gate in the EBP RSL car park. This is not anticipated to result in adverse parking impacts given the relatively short period of time these car parking spaces would be removed, the number of parking spaces available within the car park, and that the demand for commuter parking spaces would be reduced during rail possession periods.

The constrained nature of the Proposal area means that off-street parking for all construction workers would not be possible. As such, workers are encouraged to utilise public transport, carpool or find suitable on-street parking mindful of commuters.

A review of aerial imagery from 2021 to 2024 for other nearby roads such as Devon Road, Earlwood Crescent, Powys Avenue and Crewe Street shows that on-street parking utilisation along these roads is generally low throughout the week. Slade Road has a low to medium on-street parking utilisation. As such, impacts to parking from the arrival of construction workers is anticipated to be low throughout the entirety of the construction period. In addition, there is moderate on-street parking availability on the surrounding local roads to accommodate the cars that would have otherwise parked in the car spaces temporarily removed for the duration of the construction.

Public transport

Rail services would not be impacted by the construction work, with pre-planned rail possession periods to be utilised during construction of the Proposal for activities which may have otherwise impacted rail services. During the construction period, access to platforms at Bardwell Park Station would be maintained through the installation of temporary stairs on the eastern side of Hartill-Law Avenue, opposite the existing station entrance. As such, rail service access and connectivity would not be significantly impacted during the construction phase.

Bus stops would be temporarily relocated during temporary road closure periods to facilitate bus stop work. Bus services may experience an increase in travel time between seven to 18 minutes using the indicative detour routes. This may impact bus services, particularly over busy weekend periods. Access to bus services would be maintained and any changes to access would be adequately signposted.

During the full weekend closures of Hartill-Law Avenue, the 446, 473 and 491 bus services would be impacted and would be required to travel along the detour routes outlined in Figure 6-1. Consultation would be carried out with relevant bus service operators and authorities relating to any impacts to bus routes and required detours prior to construction.

Active transport

Access to the station would be maintained during construction, except during rail possessions, via a temporary access stair which would be established on the opposite side of Hartill-Law Avenue. This diversion may cause a two to three minute increase in travel time for pedestrians accessing the station. Pedestrians wishing to pass the station using the existing footpath on the station entrance side may experience similar travel time delays as a result of the footpath closure required to facilitate safe construction of the temporary station entry. The design and staging of the

temporary access, and impacts to surrounding footpath networks, would be determined and assessed during the detailed design phase of the Proposal.

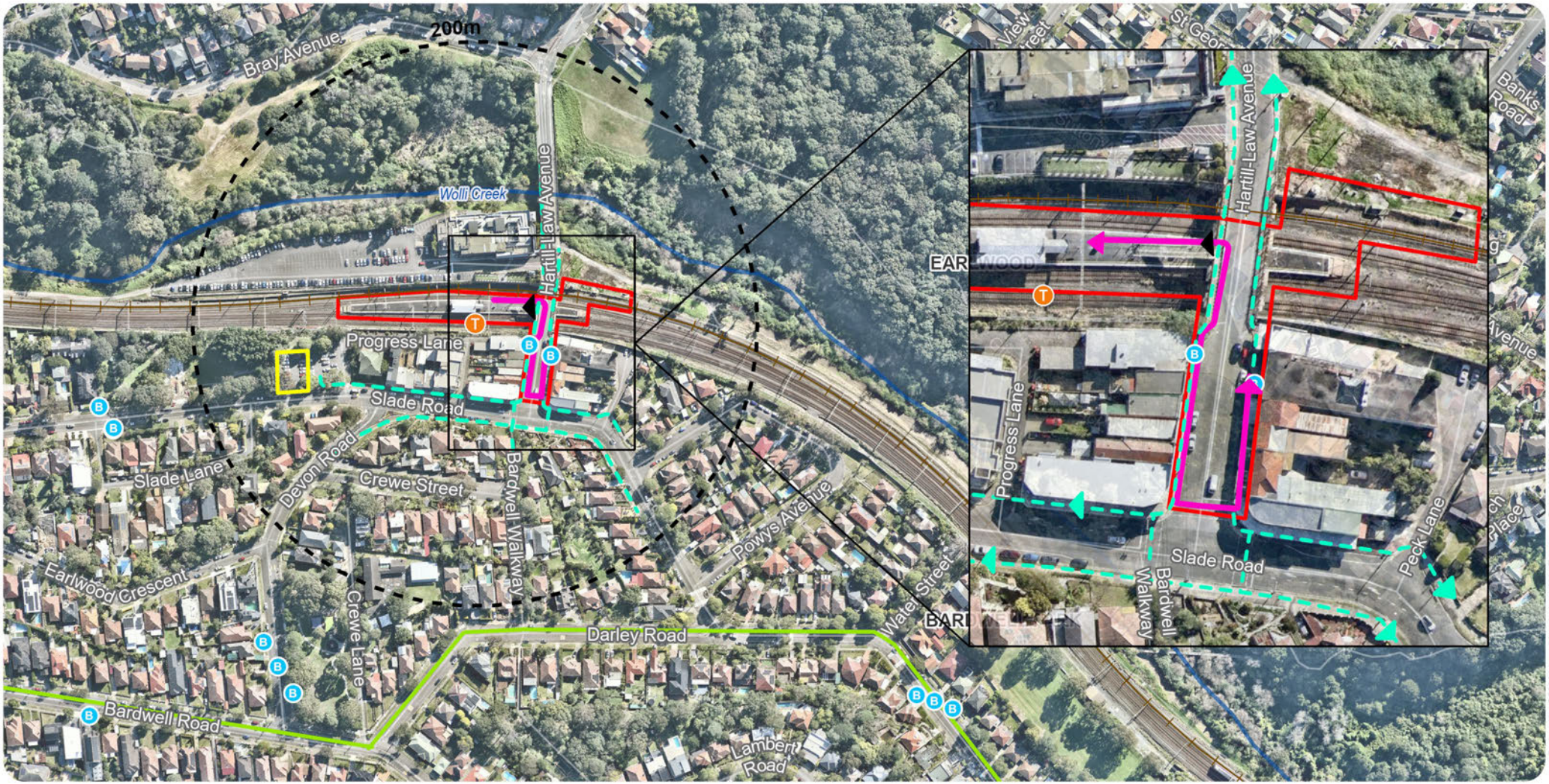
The three, full weekend closures of Hartill-Law Avenue would require detours for cyclists to cross over the existing rail line via local routes. Two detour routes are expected:

- Route 1: Detour via Slade Road, Bexley Road, Wolli Avenue and Bray Avenue
- Route 2: Detour via Slade Road, Darley Road, Bardwell Road, John Street, Hannam Street, Turella Street, Reede Street, Turella Track West, Finlays Avenue, Banks Road, Hocking Avenue, Homer Street.

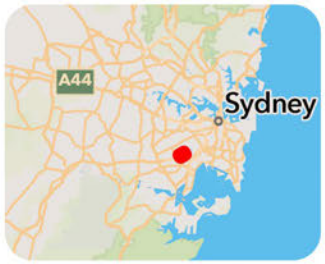
Route 1 would increase vehicle travel times by about 13 minutes and route 2, being the longer route would increase vehicle travel times by about 19 minutes. It is expected that route 1 would experience higher detour utilisation due to it being a more direct detour route.

During temporary partial road closures or other isolated aspects of construction management, cyclists may be required to dismount at select points. Additionally, there are no impacts to cycling infrastructure as there are no cycling paths or bicycle hoops around Bardwell Park Station or along Hartill-Law Avenue. Overall, the full and partial road closures on Hartill-Law Avenue are expected to have moderate impacts on cyclists.

Potential detour routes and indicative additional travel times are shown in Figure 6-2.



Proposal area
Construction compound
Study area (200m buffer)
Train Station
Railway station entry
Railway
Watercourse
Cycle routes
Primary pedestrian access to multimodal transport links
Secondary pedestrian links
Bus stops



Source: Aurecon, TfNSW, NSW Spatial Services (DCS), ESRI

1:4,000 @ A4
0 50 100 m

Projection: GDA2020 MGA Zone 56

Figure 6-2 Potential detour routes for cyclists during temporary full road closures along Hartill-Law Avenue

Path: C:\Users\Aida.Tengku\Aurecon Group\526819 - Safe Accessible Transport Program Planning Approvals Contractor - GIS\Proj\P526819_SATP_REF\P526819_SATP_REF.aprx
Project No: P522314 Map Author: Aida.Tengku Date: 16/08/2024 Revision: 0

Operation

The Proposal would improve station accessibility from the road network and transport interchange facilities through:

- the new accessible kiss and ride space on Hartill-Law Avenue
- the new accessible parking space on Hartill-Law Avenue
- relocation and accessibility upgrades to bus stops
- upgrade of existing footpaths from the upgraded bus stops and new accessible parking and kiss and ride spaces to the station entry
- the new raised pedestrian crossing on Hartill-Law Avenue
- four new bicycle hoops south of the station entry on Hartill-Law Avenue. The double-sided hoops would be able to accommodate a total of eight bicycles.

The new raised pedestrian crossing on Hartill-Law Avenue is expected to be highly utilised based on estimates from the Traffic, Transport and Access Impact Assessment (Aurecon, 2024). The new pedestrian crossing would improve the pedestrian connectivity and level of service for pedestrians. There would likely be some delay and queuing of vehicles expected particularly during the PM peak along Hartill-Law Avenue. This delay and queuing would also be impacted by the location of bus stops next to the proposed pedestrian crossing and the proximity to the Hartill-Law Avenue and Slade Road signal-controlled intersection. Delays and queuing of vehicles is a common occurrence with pedestrian crossings. Bus services using Hartill-Law Avenue may be impacted with delays to services as a result of the new pedestrian crossing having to stop/start to give way to pedestrians. However, the Proposal does not align with the *TDT 2002-12c Stopping and Parking Restrictions at Intersections and Crossings* guidelines, which states that the distance from the pedestrian crossing kerb ramp to the no-stopping sign must be at least 7.5 metres. . The ongoing operation of the Proposal is expected to have a moderate impact on the performance of the road network due to the delays and queuing to road traffic as a result of the new raised pedestrian crossing. The pedestrian crossing would be considered further during detailed design in consultation with the road authority and in consideration of community and stakeholder feedback on the concept design.

The new kiss and ride space may attract more vehicle movements and increase delays, particularly during peak hours, to vehicles travelling southbound on Hartill-Law Avenue. However, operationally, the new kiss and ride space is expected to perform in a similar manner to the existing 15-minute on-street parking space in that location in that it allows for short-term parking.

The Proposal would require the permanent removal of three 15-minute on-street car parking spaces, with two on the western side and one on the eastern side of Hartill-Law Avenue . The provision of the relocated bus bay and one accessible car space on the western side of Hartill-Law Avenue would result in the permanent loss of two parking spaces. On the eastern side, the proposed accessible kiss and ride space and relocated bus bay would require the permanent removal of one existing on-street parking space. Overall, the loss of on-street parking is considered to be minimal and the impact is outweighed by the provision of an accessible kiss-and-ride space.

The operation of the Proposal would relocate and provide accessibility upgrades to bus stops on Hartill-Law Avenue and would not impact the operation of bus routes near the station. The operation of the Proposal is not anticipated to result in any changes to the existing performance of the rail network.

6.1.4 Mitigation measures

Standard mitigation measures would be implemented to address traffic, transport and access impacts from the Proposal, including the completion of road and footpath condition surveys and reports prior to construction commencement and the repair of any damage resulting from the construction of the Proposal.

Site-specific measures to manage the potential traffic and transport impacts as a result of the Proposal are included in Table 6-2.

Table 6-2 Site specific traffic and transport mitigation measures

No.	Mitigation Measure	Responsibility	Timing
15	The temporary full and partial road closures and associated traffic management controls on public roads around the station will be managed and implemented in accordance with the provisions of Road Occupancy Licence(s).	Contractor	Pre-construction, construction
16	The emergency services, public transport operators, and other key users of the station will be notified in advance of key internal and external changes in the station. The public will be advised to allow additional travel time.	Contractor	Pre-construction, construction
17	The pedestrian crossing will be considered further during detailed design in consultation with the road authority and in consideration of community and stakeholder feedback on the concept design.	Transport/ Contractor	Detailed design
18	Investigate dedicated car parking areas, including potentially leasing off-street car parking areas, for construction workers to minimise potential impacts on the parking in the surrounding area.	Contractor	Pre-construction, construction
19	The car park on Slade Road will be reinstated to pre-construction conditions after the site compound has been demobilised.	Contractor	Post-construction

6.2 Urban design, landscape and visual amenity

6.2.1 Methodology

The potential landscape and visual amenity impacts during construction and operation of the Proposal have been assessed as part of the Landscape Character and Visual Impact Assessment (LCVIA) Aurecon, 2024b).

The following activities were carried out as part of the LCVIA:

- contextual analysis of the Proposal area through a desktop assessment to build an understanding of the current and future land uses near the Proposal and to determine the value of the built and natural environment
- identification of landscape character zones (LCZs), largely based on land zoning within and surrounding the Proposal area, and key viewpoints from key sensitive receivers likely to be impacted by the Proposal
- photographing viewpoints via a field survey on 13 June 2024
- preparation of photomontages based on the concept design to demonstrate the effect of the Proposal on key viewpoints upon opening of the station upgrade
- assessment of landscape character and visual impacts during construction and operation of the Proposal
- development of mitigation measures to manage and minimise adverse visual impacts as a result of the Proposal.

A radius of 200 metres around the Proposal area was used to determine the LCZs and viewpoints used for the assessment. The viewpoints were selected to represent key views from sensitive receivers within and near the Proposal area and illustrate a range of receiver types, view types (including elevated, panoramic and filtered views) and viewing distances to the Proposal.

The assessment of landscape character and visual impacts is based on the following factors:

- sensitivity (how critically a change to the existing landscape setting would be regarded based on the land use of the area and the distance from where it is viewed)
- magnitude (the scale, size and character of the Proposal and its proximity to the viewer and the degree to which its affect has been mitigated).

An assessment of each LCZ and representative viewpoint has been made using these factors in line with the visual impact rating matrix included in Table 6-3.

Table 6-3 Visual impact rating matrix

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

6.2.2 Existing environment

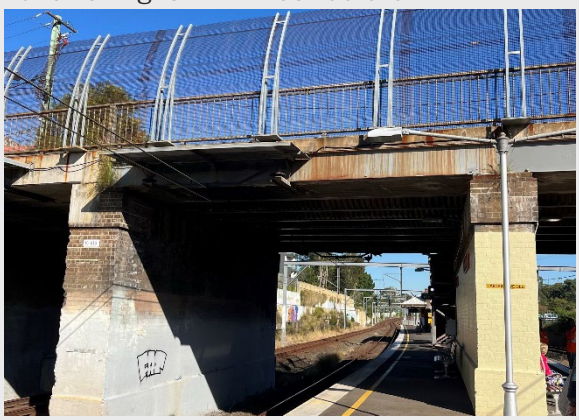
The Proposal is located along Hartill-Law Avenue in Bardwell Park, about 12 kilometres south of Sydney's CBD. The areas major centre is Earlwood which sits about 600 metres to the north of the site and connects to Bardwell Park via Fauna Street and Hartill-Law Avenue. There are several schools, preschools and churches that use Bardwell Park Station given their proximity to the Earlwood local area. The site is in a low-density residential area with a strong suburban character.

To the north of the site is the EBP RSL and a shared car park for the users of the RSL and commuters using the station. The Wolli Creek Regional Park is located directly behind the RSL to the north. To the north-east of the site sits Girrahween Park. To the south of the site are various local shops and businesses.

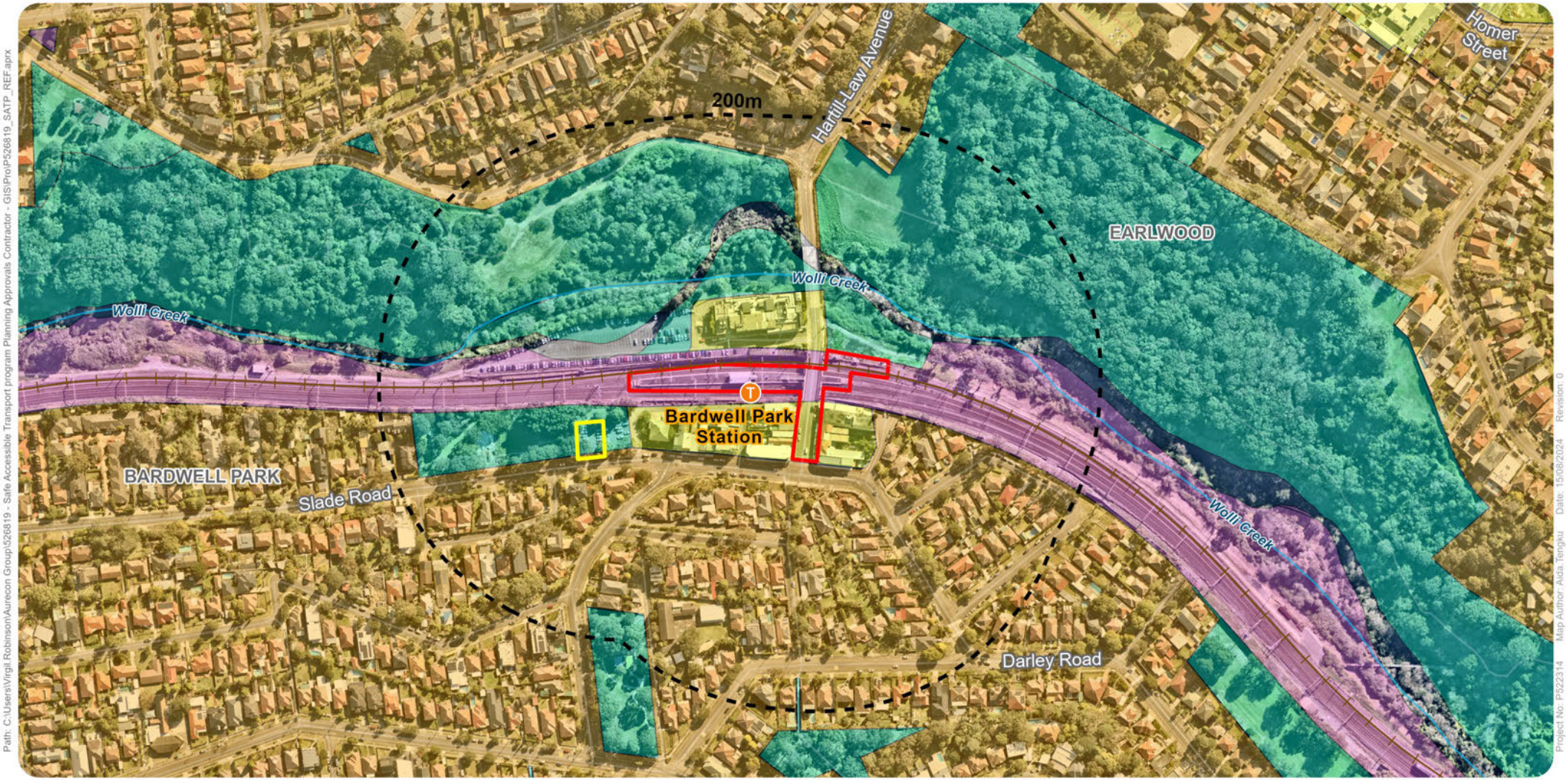
Landscape and character zones

Four LCZs have been identified as part of the LCVIA (outlined in Table 6-4 and Figure 6-3).

Table 6-4 Landscape character zones

LCZ and representative image	Description
LCZ 1 – Transport corridor Land zoning: SP2 – Infrastructure 	The station is located lower than the surrounding built environment and is not fully visible from the surrounding area. The heritage significant station building is a small brick building central to the platform with rail overbridge piers made of the same brick. To the north of the rail corridor, Wolli Creek Regional Park provides landscape amenity in this highly modified environment.
LCZ 2 – Local centre Land zoning: B1 – Local centre 	The local retail centre (located along Hartill-Law Avenue and Slade Road) comprises of shops and businesses. It is made up of one and two storey brick buildings with ground level shops. Some of these shops have offices and potential residential dwellings on the top floor. The EBP RSL and war memorial is part of the local centre although it is separated from the main section of the local centre by the rail corridor and Hartill-Law Avenue.
LCZ 3 – Residential Land zoning: R2 – Low density residential 	Several three to four storey apartment blocks are adjacent to the southern side of the rail corridor along Progress Lane and Slade Road. Apartments along Progress Lane have clear views across the station, as well as Wolli Creek Regional Park. All other residential dwellings in the Study Area are made up of single and double storey houses on individual lots.

LCZ and representative image	Description
LCZ 4 - Parks and recreation Land zoning: RE1 – Public Recreation, E1 – Local centre 	Slade Road Reserve is located 50 metres to the southwest of the station between the rail corridor and Slade Road. It is a local reserve with a circular perimeter path, informal recreation area and a small playground to the northeast end. The reserve provides a local informal recreational space and landscape amenity. Wolli Creek Regional Park is directly north of the rail corridor and is about 4.5 kilometres in length, following Wolli Creek from Bexley Road to where the creek converges with the Cooks River to the east. Girrahween Park is a narrow strip of bushland within the Regional Park located to the north-east of the station. Informal walking tracks (not paved) traverse through the park and connect with some of the residential streets to the north. The creek is the low point, with slopes rising to the north and south.



Source: Aurecon, TfNSW, NSW Spatial Services (DCS), ESRI

1:4,500 @ A4

0 50 100 m

Projection: GDA2020 MGA Zone 56

Figure 6-3: Landscape character zones

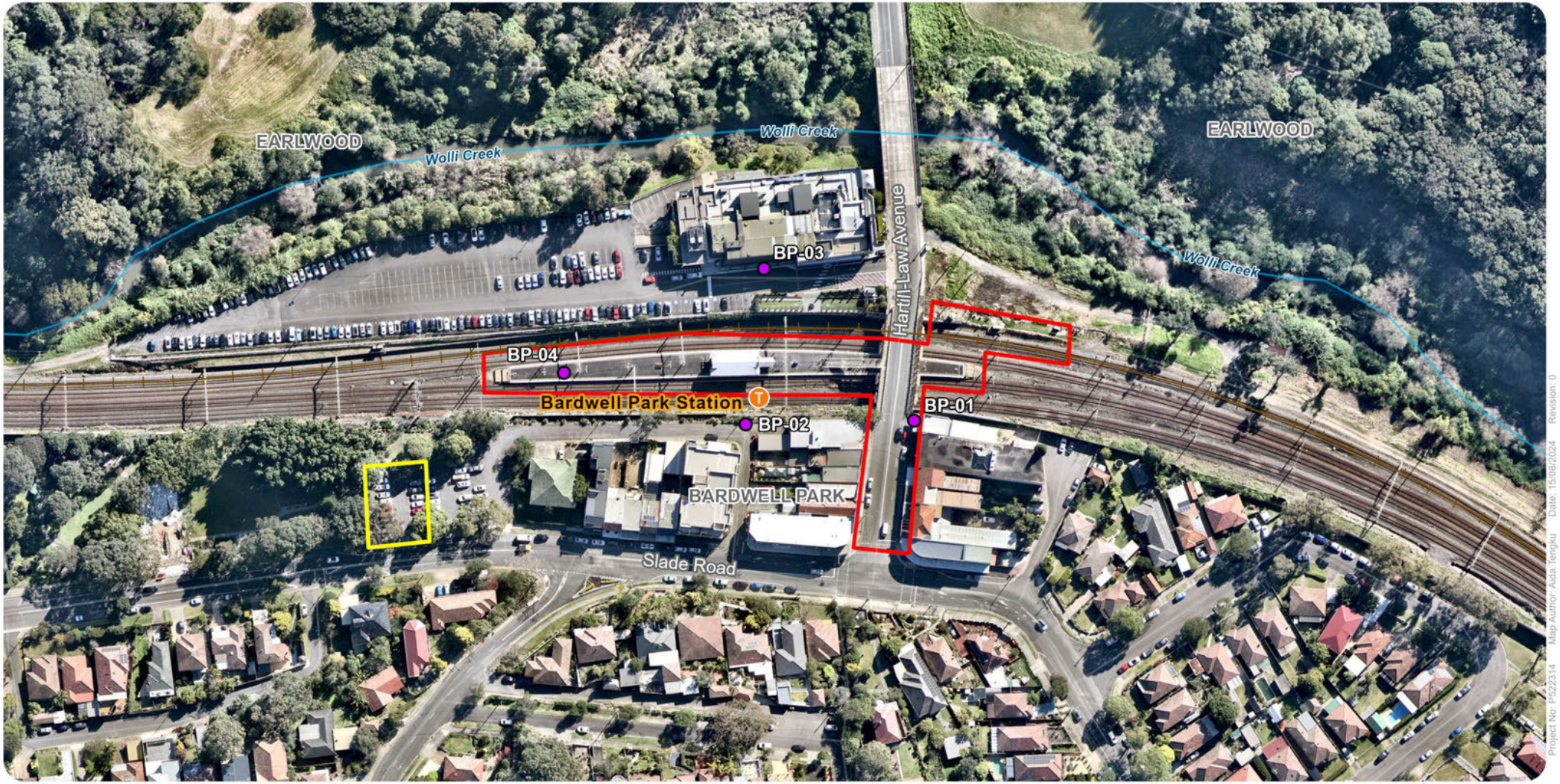
Viewpoints

Four viewpoints have been identified as part of the LCVIA (outlined in Table 6-5) and are shown in Figure 6-4.

Table 6-5 Viewpoints - existing

Viewpoint	Description
Viewpoint 1 (BP-01)–viewpoint looking northwest towards the station entrance from Hartill-Law Avenue (15 Hartill-Law Avenue) 	This viewpoint faces the rail corridor, with views of the station entrance and stairs. The overbridge has high visually permeable safety screens. The EBP RSL building is visible to the other side of the bridge, and houses between trees on a low hill are visible to the middle-ground. This is a highly modified environment, with a few shops to either side of the two-way road, with bus stops and car park spaces allocated to the sides (positioned behind the viewpoint).
Viewpoint 2 (BP-02)–viewpoint looking north towards the station entrance from Progress Lane 	This viewpoint faces the existing station and is representative of the view of the station from apartment residents at 46 Slade Road. The three apartment buildings (46, 45 Slade Road and 60-69 Progress Lane) are up to three-storeys and have balconies and windows overlooking the station and rail corridor. The foreground view is of a highly modified environment. Elevated views from apartments provide partial views over Wolli Creek Regional Park in the background.

Viewpoint	Description
Viewpoint 3 (BP-03) – viewpoint from EBP RSL looking south towards the station (18 Hartill-Law Avenue) 	This viewpoint faces the station from the EBP RSL at 18 Hartill-Law Avenue with only the top of the station building visible. The EBP RSL is a two-storey building but has limited views towards the rail corridor. The war memorial is adjacent to the rail corridor with a high brick wall screening the corridor. Landscaping lines the wall and EBP RSL driveway. Above the wall, the surrounding urban environment is noticeable. The scene is within a highly modified environment with limited visual amenity.
Viewpoint 4 (BP-04)–viewpoint from station platform west end, looking east towards Hartill-Law Avenue overbridge 	This viewpoint is looking east towards Hartill-Law Avenue overbridge from the station platform. It includes the railway tracks, a concrete platform, embankments to edge of the corridor, noise walls to the south, security fencing, heritage station building to the centre and rail ancillary infrastructure. The Hartill-Law Avenue overbridge spans the corridor in the middle-ground, with brick piers evident and safety screens barely perceptible. To the north the EBP RSL building is partially visible. Buildings to the south are visible above noise walls and contribute to the urban character. Bushland, part of Wolli Creek Regional Park, is noticeable in the background of the view.



Proposal area
Site compound
Train station
Railway
Watercourse
Viewpoint locations

Source: Aurecon, TfNSW, NSW Spatial Services (DCS), ESRI

1:2,000 @ A4
0 25 50 m

Projection: GDA2020 MGA Zone 56

Safe Accessible Transport program - Bardwell Park Review of Environmental Factors

Figure 6-4: Viewpoint locations

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Project No: P522314 Map Author: Aida.Tengku Date: 15/08/2024 Revision: 0

6.2.3 Potential impacts

Construction

The construction of the Proposal is anticipated to result in a temporary reduction in the landscape character of the station and its surrounds. Table 6-6 provides a summary of landscape character impacts during the construction of the Proposal.

Table 6-6 Construction landscape character impacts

LCZ	Sensitivity	Magnitude	Overall impact
LCZ 1 – Transport corridor	Low	High	**Moderate adverse** The majority of the works would occur within the rail corridor. There would be a temporary reduction in the landscape and urban functionality of the station precinct during construction. LCZ1 would be subject to temporary high magnitude of change resulting in a moderate adverse urban landscape impact.
LCZ 2 – Local centre	Low	High	**Moderate adverse** Construction would have a high impact on the pedestrian connectivity and amenity within a limited area of the local centre. This would lead to a moderate adverse impact.
LCZ 3 – Residential	Moderate	Negligible	**Negligible** There are negligible impacts to the landscape character of the residential zone as a result of construction as the area sits within a highly modified environment.
LCZ4 - Parks and recreation	High	Low	**Moderate adverse** The temporary site compound within the existing Slade Road car park would be visually noticeable due to the presence of sheds, equipment, laydown of materials and the like. As the proposed site compound is within an existing car park, the contrast in use and physical character is negligible. Slade Road Reserve playground would experience temporary reduction in amenity, with a low magnitude of change. The Proposal would not impact the use of the park.

Construction activities would be visible in the identified viewpoints and result in temporary visual impacts during construction. Table 6-7 provides a summary of impacts to viewpoints during construction of the Proposal.

Table 6-7 Construction impacts to viewpoints

Viewpoint	Sensitivity	Magnitude	Overall impact
Viewpoint 1 (BP-01)– viewpoint looking northwest towards the station entrance from Hartill-Law Avenue (15 Hartill-Law Avenue)	Low	High adverse	**Moderate adverse** The sensitivity of this view is considered low as it is considered representative of the pedestrian or transient view looking northwest towards the station entrance. During construction, demolition and installation works around the station entry, as well as pavement/kerb work would be in foreground views. The level of visual modification during construction for local centre users is considered to have a high adverse magnitude of change.
Viewpoint 2 (BP-02)– viewpoint looking north towards the station entrance from Progress Lane	Moderate	Moderate adverse	**Moderate adverse** The sensitivity of this view is considered moderate as it is representative of the view from apartment building residents overlooking the rail corridor. During construction, work would be in the foreground of the viewpoint. Construction activity would be noticeable including the use of a crane for the station entry works and lift installation. The visual modification would be experienced temporarily by a low number of residents and is considered moderate adverse.
Viewpoint 3 (BP-03) –viewpoint from EBP RSL looking south towards the station (18 Hartill-Law Avenue)	Moderate	Moderate adverse	**Moderate adverse** The sensitivity of this viewpoint is considered moderate as it is representative of the view from the EBP RSL looking south towards the station. During construction, work would be close to the viewpoint and would be viewed clearly, however, would remain partially screened by the existing brick wall. Construction activity would be noticeable including use of a crane for the station entry work including the lift installation. The visual modification is experienced temporarily by visitors and is considered moderate adverse.
Viewpoint 4 (BP-04)– viewpoint from station platform west end, looking east towards Hartill-Law Avenue overbridge	Low	High adverse	**Moderate adverse** The sensitivity of this viewpoint is considered moderate as it would be the view of customers temporarily waiting on the platform. During construction, temporary access would be constructed to continue to provide access to the station platforms, existing canopies would be removed as well as the removal of the existing stairs. Work would be experienced in the foreground views for short durations while waiting and boarding trains. Work areas with equipment would be located on the platform surrounded by hoarding. In addition, the site compound would be partially visible within Slade Road Reserve to the south. The magnitude of change is considered high.

In addition, the site compound would be visible to Slade Road Reserve playground users and residents within adjacent apartments during construction of the Proposal. The level of temporary visual modification is considered moderate for receivers of moderate sensitivity (low number of users within an urban area), and therefore a moderate adverse visual impact during construction.

Operation

The Proposal would provide the following new station features during operation:

- a new elevated walkway with a lift
- new stairs with canopy coverage
- anti-throw and protection screens
- platform canopy coverage
- upgrades to station interchange facilities
- upgrades to the station building
- minor upgrades to station platforms.

Table 6-8 provides a summary of the landscape character impacts from operation of the Proposal.

Table 6-8 Operational landscape character impacts

LCZ	Sensitivity	Magnitude	Overall impact
LCZ 1 – Transport corridor	Low	Low beneficial	**Low beneficial** The transport corridor would be subject to a low beneficial magnitude of change as it would involve modification within a highly modified environment. The Proposal would: • upgrade the station entry and interchange facilities • increase canopy cover along the platforms • improve lighting levels underneath canopies. The installation of new lighting at the station entrance, along the new stairs and on new platform canopies as well as the installation of transparent, separate canopies instead of one continuous canopy, would contribute to improved lighting levels • improve wayfinding throughout the station. These physical features of the Proposal combined with the low visual sensitivity would result in an overall low beneficial impact to this LCZ.
LCZ 2 – Local centre	Low	Low beneficial	**Low beneficial** The local centre would experience low beneficial magnitude of change as it would involve improvements to the landscape and urban functionality of the station precinct and the local centre. The Proposal would: • increase local centre connectivity to the station through the installation of the new pedestrian crossing • provide easy access to the local centre and station for those who have mobility issues via the allocation of an accessible parking space along Hartill-Law Avenue This combined with the low sensitivity would result in an overall low beneficial impact to this LCZ.

LCZ	Sensitivity	Magnitude	Overall impact
LCZ 3 – Residential	Moderate	Negligible	**Negligible** The Proposal would not alter the landscape character of residential areas surrounding the station. As such, it would result in negligible landscape character.
LCZ4 - Parks and recreation	High	Negligible	**Negligible** The Proposal would not alter the landscape character of the parks and recreation areas surrounding the station. As such, it would result in negligible landscape character impacts.

Table 6-9 provides a summary of operational impacts to the identified viewpoints, including indicative photomontages of the Proposal from assessed viewpoints.

Table 6-9 Operational impacts to viewpoints

Viewpoint
Viewpoint 1 (BP-01)–viewpoint looking northwest towards the station entrance from Hartill-Law Avenue (15 Hartill-Law Avenue) (photomontage is indicative only, subject to detailed design)
Existing viewpoint 
Operational viewpoint 
Overall impact **Sensitivity:** Low **Magnitude:** Low beneficial **Visual impact:** Low beneficial The sensitivity of this view is considered low as it is representative of the pedestrian or transient view looking northwest towards the station entrance. The new station entry, elevated walkway, lift and stairs would be visible in the foreground. The structure would not contrast with the existing environment in form or scale. Upgrades to the local centre provides an uplift to the streetscape including a new pedestrian crossing, bicycle parking, kiss and ride and upgrades to the bus stops and footpaths.

Viewpoint
Viewpoint 2 (BP-02)–viewpoint looking north towards the station entrance from Progress Lane (photomontage is indicative only, subject to detailed design)

Existing viewpoint

Operational viewpoint

Overall impact
Sensitivity: Moderate
Magnitude: Low
Visual impact: Moderate-Low (neutral)
The sensitivity of this view is considered moderate as it is representative of the view from apartment building residents overlooking the rail corridor. The upgraded station entry, lift and stairs would sit within the foreground view. The scale and form of the structure would not contrast against the EBP RSL. The station structures would not obscure views of the regional park from the apartments.

Viewpoint
Viewpoint 3 (BP-03) – viewpoint from EBP RSL looking south towards the station (18 Hartill-Law Avenue) (photomontage is indicative only, subject to detailed design)

Existing viewpoint

Operational viewpoint

Overall impact
Sensitivity: Moderate
Magnitude: Low
Visual impact: Low (neutral)
The sensitivity of this viewpoint is considered moderate as it is representative of the view from the EBP RSL looking south towards the station.
The installation of the station elevated walkway, lift shaft and stairs would sit within the foreground view of the war memorial. However, the scale and form of the structure would not contrast against the urban form of the shopping village. The low modification to the viewpoint is not considered adverse or beneficial and has been given a neutral impact.

Viewpoint
Viewpoint 4 (BP-04)–viewpoint from station platform west end, looking east towards Hartill-Law Avenue overbridge

Existing viewpoint

Operational viewpoint

Note: photomontages were only produced for viewpoints with anticipated higher adverse visual impacts to the most sensitive visual receivers as a result of the Proposal. As such, no photomontage was produced for this viewpoint.

Overall impact

Sensitivity: Moderate
Magnitude: Low
Visual impact: Low (neutral)

The sensitivity of this viewpoint is considered moderate as it would be the view of customers temporarily waiting on the platform.
The installation of the station canopies would be present in the foreground view. These new canopies would sit in alignment with the existing canopies. The new station entrance would be noticeable in the background as it would sit taller than the existing entrance and be constructed by contemporary materials. Other changes on the station platform include new bench seats, accessible water refill, additional Opal card readers and wayfinding signage.

6.2.4 Mitigation measures

Standard mitigation measures outlined in Section 7.2 would be implemented to minimise potential landscape and visual amenity impacts of the Proposal and to maximise opportunities to improve the urban design and form of the Proposal. This would include preparation of an Urban Design and Landscape Plan (UDLP).

In addition, the site specific landscape and visual amenity mitigation measures outlined in Table 6-10 would be implemented.

Table 6-10 Site specific urban design, landscape and visual amenity mitigation measures

No.	Mitigation measure	Responsibility	Timing
25	Public art and cultural interpretative elements should be incorporated during detailed design and could be incorporated in perforated screens and solid wall facades.	Transport / Contractor	Detailed design
26	Alternative traffic barriers along Hartill-Law Avenue overbridge that provide better pedestrian-scale (height and width) and improved streetscape amenity shall be investigated during detailed design.	Transport / Contractor	Detailed design
27	Enhancement of landscape amenity through planting within the local centre shall be considered during detailed design.	Transport / Contractor	Detailed design

6.3 Noise and vibration

6.3.1 Methodology

The potential noise and vibration impacts during construction and operation of the Proposal have been assessed as part of the Noise and Vibration Impact Assessment (SLR, 2024).

The noise and vibration assessment included:

- unattended noise monitoring within and surrounding the Proposal area in June 2024 at the locations shown in Figure 6-5
- defining noise catchment areas (NCAs) based on areas with similar land uses and locations as shown in Figure 6-5
- determining criteria for the potential noise impacts from the Proposal based on the background noise levels measured during unattended noise monitoring
- assessment of worst-case noise impacts at surrounding receivers during the following construction work scenarios:
  - site establishment, enabling works and demobilisation (W.001)
  - main work – decommissioning work (W.002)
  - main work - excavation and piling works, including new underline crossings (ULX) (W.003)
  - main work - concrete works around elevated platform and stairs (W.004)
  - main work - installation of new elevated platform, lift, stairs and electrical upgrades (W.005)
  - main work – platform regrading (W.006)
  - main work – installation of new canopies (W.007)
  - main work – station building modifications (W.008)
  - main work - station access works (W.009)

  - main work – tree removal (W.010)
  - finishing work – landscaping and furniture, etc (W.011)
  - site compound – general operation (W.012).
- assessment of potential vibration impacts using the Transport *Construction Noise and Vibration Guideline (Public Transport Infrastructure)* (Transport, 2023a) (CNVG) minimum working distances for cosmetic damage and human comfort
- a qualitative assessment of potential noise impacts during operation of the Proposal.

6.3.2 Existing environment

Bardwell Park Station is surrounded by various commercial and residential receivers (refer to Figure 6-5). The closest receivers are commercial properties opposite the Proposal on Hartill-Law Avenue and residential receivers on Progress Lane.

The results of unattended noise monitoring are included in Table 6-11. The measured existing noise levels are representative of receivers potentially most affected by the Proposal.

Table 6-11 Summary of unattended noise monitoring results

ID	Address	Measured noise level (dBA)					
		Background noise (RBL)			Average noise (L_{Aeq})		
		Day	Evening	Night	Day	Evening	Night
L01	17 Bray Street, Earlwood	42	42[1]	35	53	52	47
L02	20 Slade Road, Bardwell Park	41	41[1]	33	50	49	45

Note 1: The evening RBL has been reduced to match the daytime RBL due to the measured evening RBL being higher than the daytime, as per the NSW Environment Protection Authority's Noise Policy for Industry.

Figure 6-5 Noise catchment areas, receivers and noise monitoring locations (SLR, 2024)

6.3.3 Potential impacts

Construction

Noise impacts during construction have been assessed at sensitive receivers during each construction work scenario outlined in the Noise and Vibration Impact Assessment (SLR, 2024). Impacts have been assessed based on the magnitude of exceedance of noise management levels (NML) identified for standard daytime hours and out of hours work periods. Table 6-12 outlines the NMLs for the Proposal, which have been defined based on the rating background noise level (RBL) identified during on-site noise monitoring (refer to Table 6-11). Table 6-13 outlines NML exceedances for the different scenarios based on the Transport CNVG perception categories.

Table 6-12 Construction noise management levels

NCA	Receiver type	Noise Management Level ($L_{Aeq(15minute)}$ – dBA)				Sleep disturbance screening criteria (L_{Amax})
		Standard daytime hours (RBL +10 dB)	Out of Hours (RBL + 5 dB)			
			Daytime	Evening	Night	
NCA01	Residential	52	47	47	40	52
NCA02	Residential	51	46	46	38	52
All	Commercial	70 (when in use)				n/a
All	Industrial	75 (when in use)				n/a
All	Educational	55 (external noise level, when in use)				n/a
All	Place of workshop	55 (external noise level, when in use)				n/a
All	Child Care	50 (external noise level, when in use)				n/a

Table 6-13 NML exceedance levels for construction

CNVG perception categories	NML exceedance	
	Daytime – standard construction hours	Out of hours period
Noticeable	N/A	1–5dBA
Clearly audible	1–10dBA	6–15dBA
Moderately intrusive	11–20dBA	16–25dBA
Highly intrusive	>20dBA	>25dBA

Detailed results of NML exceedances predicted for residential receivers and other sensitive receivers is outlined in Table 17 of the Noise and Vibration Impact Assessment (SLR, 2024). A summary of the assessment outcomes is provided within this section.

For most construction noise scenarios, it is anticipated that the construction noise levels would be frequently lower than the worst-case predicted. The assessment is generally considered conservative as the calculations assume that several items of construction equipment would be in use at the same time within individual scenarios. During construction, noise impacts are predicted to be highest when noise intensive equipment is in use and work is near sensitive receivers. These worst-case impacts are, however, generally limited to a relatively small number of the nearest residential receivers and it is predicted this scenario would only occur for a relatively short period of time. There would often be times where noise impacts are much lower, or noise levels are relatively low and no impacts would occur. Receivers further away from the work would experience lower noise impacts due to increased distance.

During standard daytime hours:

- The highest noise impacts are predicted during 'main works -station access works' (W.009) and most 'main works' (W.002 to W.010) construction scenarios at residential receivers to the south and east of the station in NCA02, due to the use of noise intensive equipment such as jack hammers, concrete saws, chippers or chainsaws.
- The 'main works - excavation and piling' (W.003), 'main works – platform regrading' (W.006) and 'main works – station access works' (W.009) construction scenarios, are predicted to be Highly Noise Affected (noise levels greater than 75 dBA) for up to a total of six receivers when jackhammers and concrete saws are being used. These receivers are located directly south of the work in NCA02.
- Residential receivers within NCA02 under the following construction scenarios would experience 'highly intrusive' noise impacts:
  - up to eight receivers during 'main works - station access works' (W.009)
  - up to five receivers during 'site establishment, enabling works and demobilisation' (W.001)
  - up to three receivers during 'main works - platform regrading' (W.006) and 'main works- tree removal' (W.010)
  - up to two receivers during 'main works- installation of new canopies' (W.007) and 'main works - station building modifications' (W.008)
  - one receiver during 'main works- decommissioning' (W.002) and 'main works- excavation and piling works, including new ULX' (W.003).
- 'Moderately intrusive' impacts would occur at the closest residential receivers to the Proposal within NCA02 across all scenarios. These impacts would also be experienced within NCA01 in 'main works- station access' (W.009) and 'main works- tree removal' (W.010) construction scenarios.
- 'Clearly audible' impacts would occur at the closest residential receivers to the Proposal within NCA01 and NCA02 across most construction scenarios. However, NCA01 receivers would not be impacted during the 'finishing works- landscaping and furniture, etc' (W.011) and the 'site compound - general operation' (W.012) construction scenarios.
- Lower noise level impacts would generally be experienced by residential receivers towards the northern portion of NCA01 due to this area being more distant from the work.

Figure 6-6 shows receivers that would experience 'moderately intrusive' or 'highly intrusive' noise impacts and receivers that would be Highly Noise Affected during standard daytime construction work. These receivers would be eligible for consideration of additional mitigation measures, subject to confirmation during detailed design.

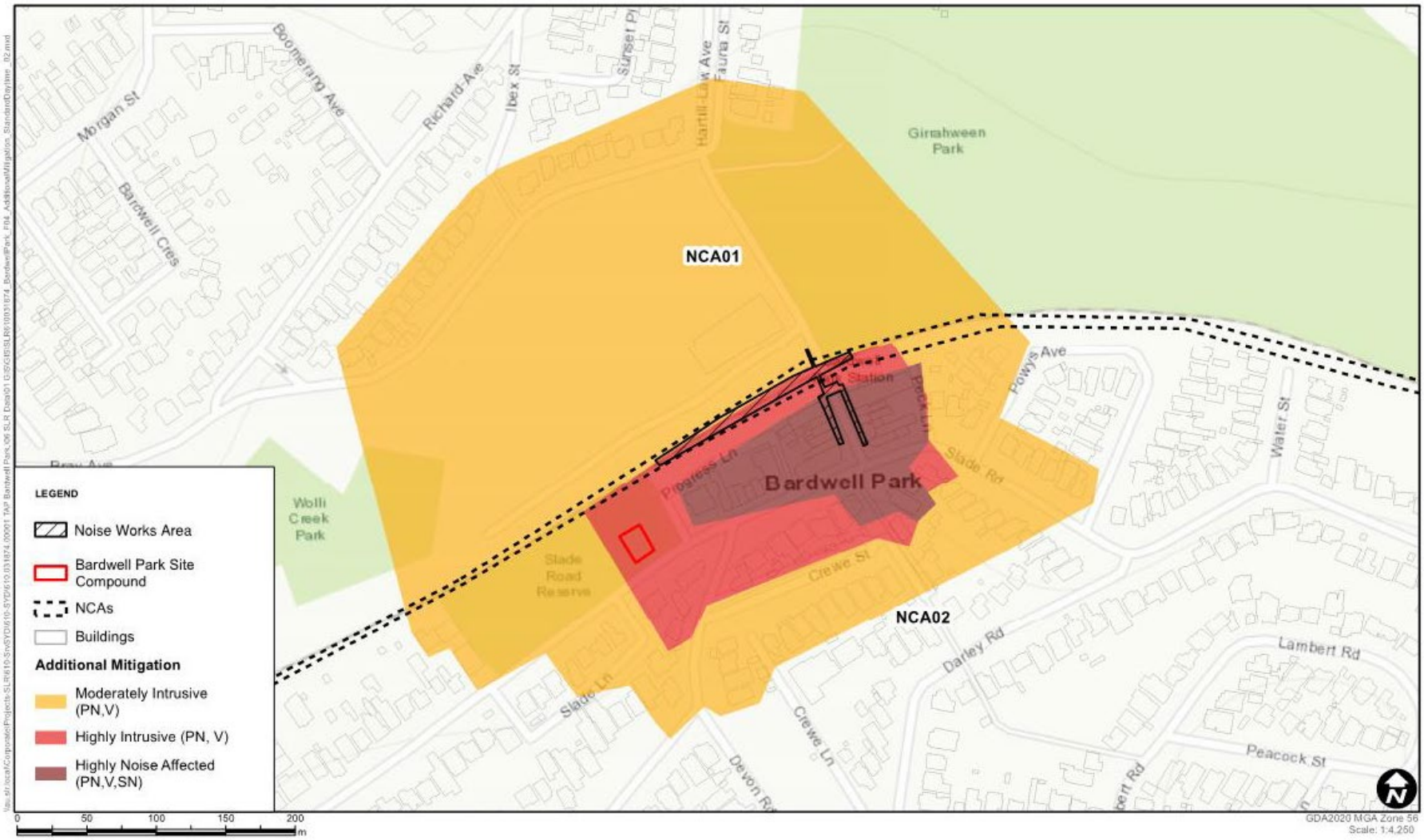
As noted in Section 3.3.3, some out-of-hours works may be required prior to rail possessions for preparation works/deliveries, i.e. Monday night to Thursday night between 11.00 pm and 3.00 am (OOHW period 1). During these evening periods:

- Up to eight receivers in NCA02 are predicted to have 'highly intrusive' impacts when noise intensive equipment is in use with the highest number of impacts occurring during 'main works - station access works' (W.009) along Hartill-Law Avenue. These receivers are located south of the station and are immediately adjacent to work areas where noise intensive equipment would likely be used.
- 'Moderately intrusive' evening impacts are predicted at receivers within around 230 metres of this work, with receivers further from the work experiencing 'clearly audible' and 'noticeable' noise impacts.

As noted in Section 3.3.3, OOHW period 2 night-time work would occur during six rail possessions that would occur over six weekends across 2025 and 2026. During night-time periods:

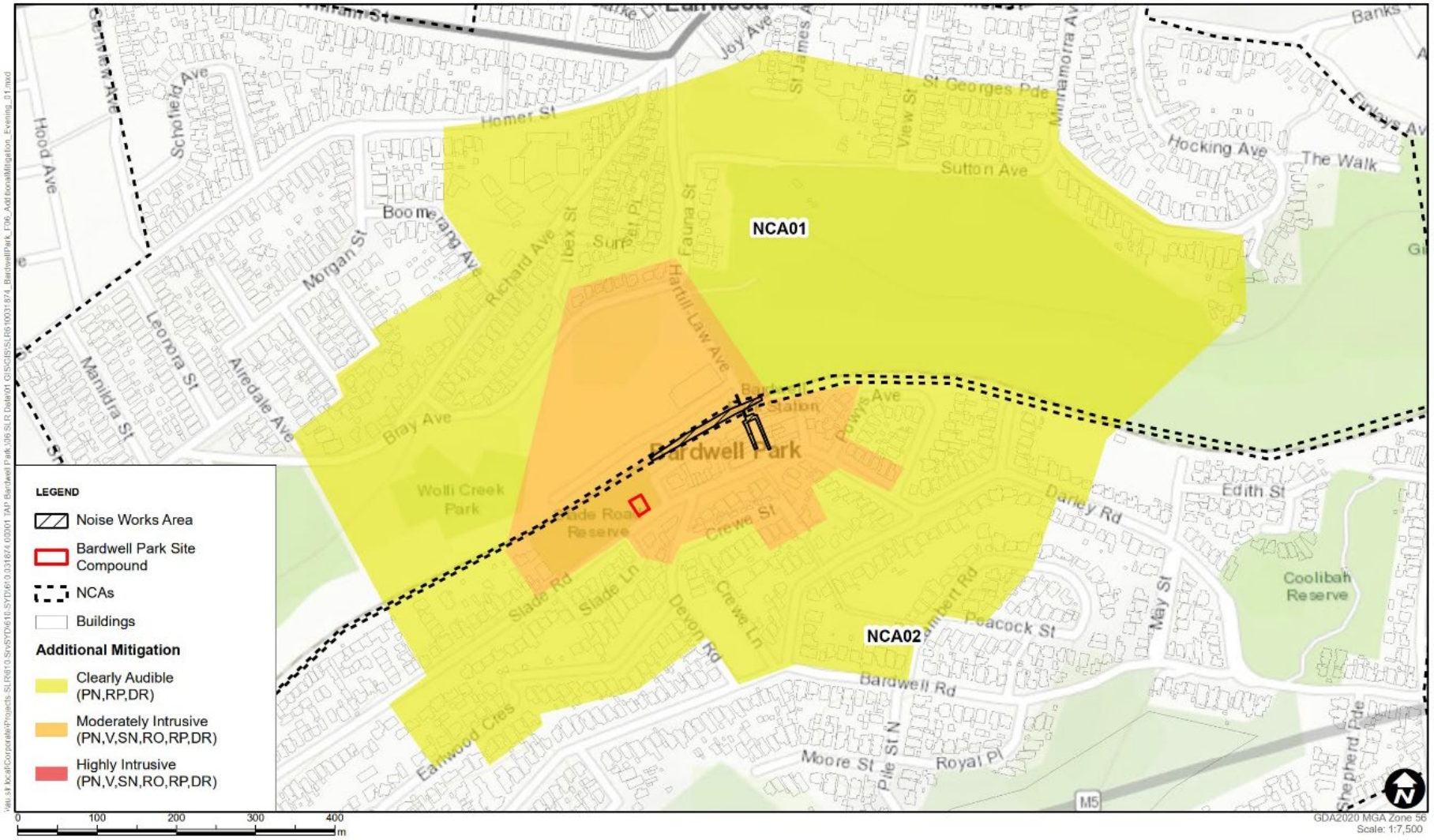
- Up to 24 residential receivers in NCA02 are predicted to have 'highly intrusive' impacts when noise intensive equipment is in use with the highest number of impacts occurring during 'main works - station access works' (W.009) along Hartill-Law Avenue.
- 'Moderately intrusive' night-time impacts are predicted at residential receivers within around 400 metres of this work, with receivers which are further from the work experiencing 'clearly audible' or 'noticeable' noise impacts.
- The sleep disturbance screening criterion for NCA01 and NCA02 is likely to be exceeded across all scenarios where 'moderately intrusive' night-time impacts have been predicted.

Figure 6-7 shows receivers that would experience noise impacts during evening construction work i.e. OOHW period 1. Figure 6-8 shows receivers that would experience noise impacts during night-time construction work i.e. OOHW period 2. These receivers would be eligible for consideration of additional mitigation measures, subject to confirmation during detailed design.



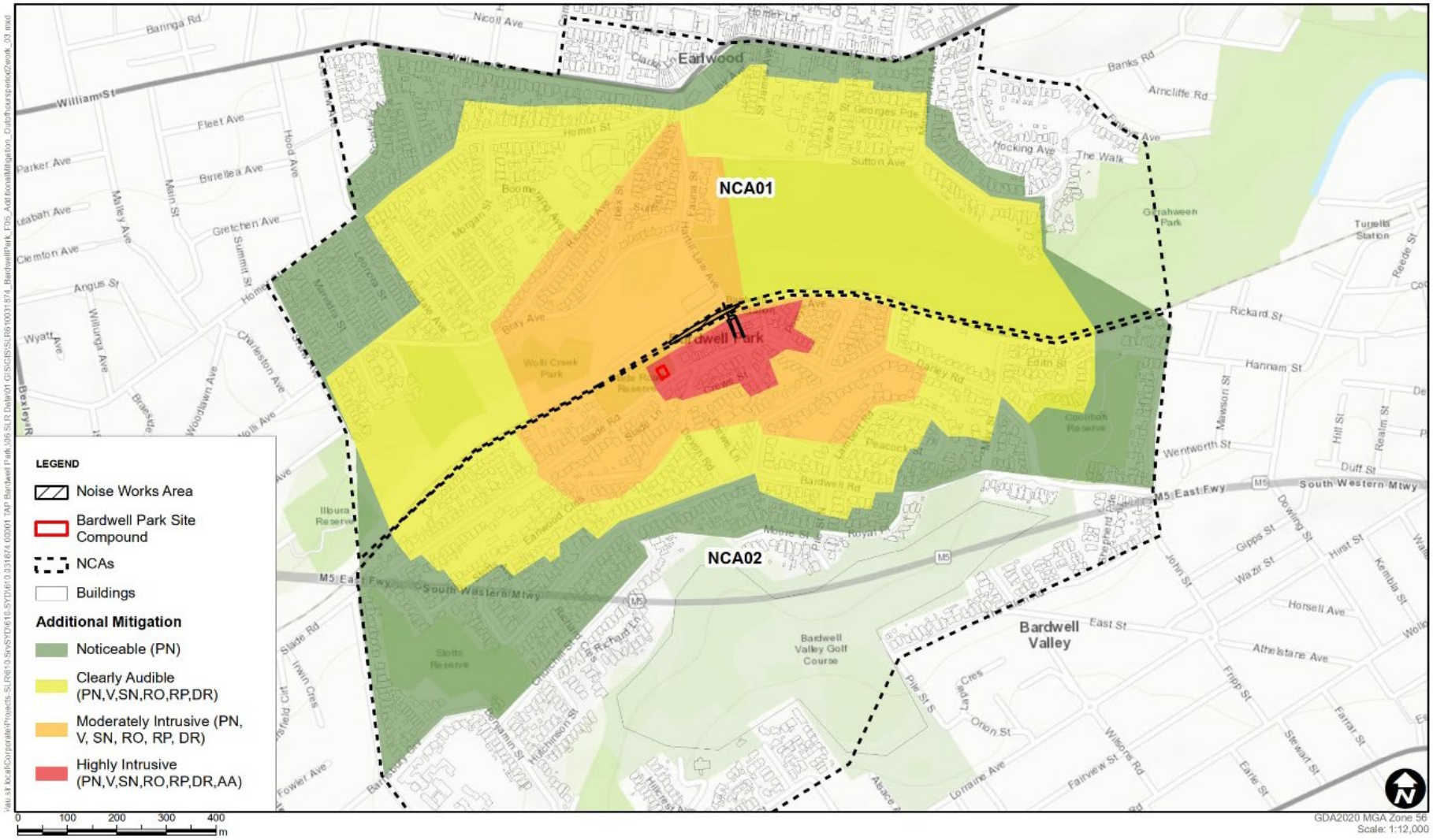
NOTE: PN = Periodic notification, V= Verification monitoring, SN= Specific Notification

Figure 6-6 Summary of noise impacts and recommended mitigation – standard daytime hours (SLR, 2024)



NOTE: PN = Periodic notification, V= Verification monitoring, SN= Specific notification, RO= Respite offer, RP= Respite period, DR= Duration respite

Figure 6-7 Summary of noise impacts and recommended mitigation – Out of Hours Period 1 works (SLR, 2024)



NOTE: PN = Periodic notification, V= Verification monitoring, SN= Specific notification, RO= Respite offer, RP= Respite period, DR= Duration respite, AA= Alternative accommodation

Figure 6-8 Summary of noise impacts and recommended mitigation – Out of Hours Period 2 works (SLR, 2024)

The following would be experienced for 'other sensitive' (i.e. non-residential) receivers:

- Up to 11 commercial buildings within NCA02 are predicted to experience 'highly intrusive' impacts during the 'main works - station access works' (W.009) construction scenario due to the close proximity of the Proposal. These commercial buildings are located on Hartill-Law Avenue in NCA02 and sit directly adjacent to the work.
- Up to two education buildings at Our Lady of Lourdes Catholic Primary School are predicted to have 'clearly audible' noise impacts during 'main works - decommissioning works' (W.002), 'main works - platform regrading' (W.006), 'main works - station access works' (W.009) and 'main works - tree removal' (W.010) construction scenarios.
- Earlwood Preschool is predicted to have 'clearly audible' impacts during 'main works - decommissioning works' (W.002), 'main works - platform regrading' (W.006), 'main works - installation of new canopies' (W.007), 'main works - station access works' (W.009) and 'main works - tree removal' (W.010) construction scenarios.
- Bardwell Park Infants School is predicted to have 'clearly audible' impacts during 'site establishment' (W.001) and 'main works - platform regrading' (W.006) construction scenarios.

The Proposal is expected to require up to 20 heavy vehicle deliveries per day during peak construction periods (during scheduled track work rail possessions), with fewer deliveries required during non-track work periods. The relatively small number of construction vehicles is not expected to have a significant impact on existing road traffic noise levels and therefore is not anticipated to exceed the adopted traffic noise criteria.

Minimum working distances for vibration intensive equipment have been determined in line with the Transport CNVG and are as follows for a vibratory roller which is considered the main potential source of vibration during construction:

- cosmetic damage – 20 metres
- human comfort – 100 metres.

Figure 6-9 shows buildings within these minimum working distances.

Commercial receivers along Hartill-Law Avenue are within the minimum working distances for cosmetic damage (i.e. within 20 metres for a vibratory roller). To minimise impacts to these receivers, mitigation measures such as implementing different construction methods with lower source vibration levels, would be considered (see Section 6.3.4).

Some commercial and residential receivers surrounding the Proposal area located along Hartill-Law Avenue, Peck Lane, Slade Road, Devon Road, Crewe Street and Powys Avenue are within the minimum working distances for human comfort (i.e. within 100 metres for a medium vibratory roller). Occupants of affected buildings may be able to perceive vibration impacts at times when vibration intensive equipment is in use. Where impacts are perceptible, they would likely only be apparent for relatively short durations when vibration intensive equipment is nearby.

Given the current exposure of Bardwell Park Railway Station Group (listed on the TAHE Section 170 Heritage and Conservation Register) to rail vibration, this heritage structure is assumed to be structurally sound and unlikely to have an elevated risk from vibration damage as a result of construction activities. In addition, Wolli Creek Valley is listed within Schedule 5 of the Bayside LEP (Item I389) however, is located at least 30 metres from the work and is not expected to be impacted by vibration.

No vibration intensive plant or equipment is proposed to be used within the site compound.

Figure 6-9 Construction vibration minimum working distances (SLR, 2024)

Operation

The dominant source of existing noise within and near the Proposal area is the existing rail network. As the Proposal would not increase the number of trains travelling through the station each day, it is not expected to increase noise generated by trains on the rail network.

While Proposal would introduce new infrastructure, these items are not anticipated to generate significant noise or vibration emissions. In addition, the potential noise from any increase in patronage of the station due to an increase in accessibility would not be substantial when compared to the existing ambient noise environment.

As such, the Proposal is not anticipated to result in operational noise and vibration impacts.

6.3.4 Mitigation measures

Standard mitigation measures outlined in Section 7.2 would be implemented to minimise potential noise and vibration impacts of the Proposal. This would include preparation and implementation of a construction noise and vibration management plan (CNVMP), identifying relevant additional mitigation measures from the Transport CNVG to minimise predicted noise and vibration impacts to nearby sensitive receivers. These additional measures would be confirmed by the Contractor during preparation of the CNVMP.

In addition, the site-specific noise mitigation measure outlined in Table 6-14 would be implemented.

Table 6-14 Site specific noise and vibration mitigation measures

No.	Mitigation Measure	Responsibility	Timing
35	Where noise intensive equipment is to be used near sensitive receivers, it is recommended that the work is scheduled for standard daytime construction hours. Where this is not possible, then the work shall be scheduled in accordance with the *Construction noise and vibrations guideline (public transport infrastructure)* (Transport for NSW, 2023a) 5.1.2 OOHW hierarchy, and completed as early as possible in each work shift to minimise the potential for night-time impacts.	Contractor	Construction
36	Where work is identified as being within the vibration minimum working distances and is considered likely to exceed cosmetic damage criteria: • different construction methods with lower source vibration levels shall be investigated and implemented, where feasible • attended vibration measurements shall be carried out at the start of work to determine actual vibration levels at nearby receivers (works would be ceased if the monitoring indicates exceedance of the cosmetic damage criteria).	Contractor	Construction
37	Work that is likely to have a 'clearly audible' impact on Our Lady of Lourdes Catholic Primary School and the Earlwood Preschool should be scheduled on weekends where possible.	Contractor	Construction

6.4 Aboriginal cultural heritage

6.4.1 Methodology

The following section assesses the Aboriginal cultural heritage impacts that may occur when constructing and operating the Proposal. The assessment has been informed by a Stage 1 assessment (Transport, 2024b) in line with the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (Transport, 2011) to assess the potential risk of impacts on Aboriginal cultural heritage from the Proposal.

The assessment included searches of the Aboriginal Heritage Information Management System (AHIMS) (13 March 2024) and the National Native Title Register (13 March 2024). AHIMS extensive searches were also conducted as the basic searches found Aboriginal sites within the search area, which was larger than the Proposal area (a 200 metre radius around the Lot and DP containing the station) and extended about 350 metres north-east and about 520 metres west from Hartill-Law Avenue following the railway line.

6.4.2 Existing environment

The AHIMS searches revealed that there are four recorded Aboriginal heritage sites within 200 metres of the search area. These are summarised in Table 6-15. However, no recorded Aboriginal heritage sites were identified to be located within the Proposal area.

Table 6-15 Aboriginal heritage sites within 200 metres of the Proposal area

#	Site Name	Site features	Site status
45-6-3699	WC-OVRH-2	Potential Archaeological Deposit (PAD)	Valid
45-6-2566	Wolli Creek 2.1	Artefact – shelter with deposit	Valid
45-6-2414	Wolli Creek 1.6	Artefact – shelter with deposit	Valid
45-6-2565	Wolli Creek 2.4	Artefact – shelter with deposit	Valid

The search of the National Native Title Register returned no results for the Proposal area.

The Wolli Creek valley (about 100 metres north of the Proposed area) lies within Bardwell Park which would have offered a particularly rich resource environment for Sydney Aboriginal people. Around 10,000 years ago, people living along the Wolli Creek valley could have walked downstream along the riverbanks to the sea about 30 kilometres beyond the current day coastline. Along the creek, people may have hunted small animals, gathered plants and caught freshwater fish and eels.

The Sydney region was a landscape rich with the imprints of activity, art and culture such as rock engravings and paintings, scarred and carved trees, ceremonial rock and mound structures, cooking ovens, villages of bark huts, stone tool quarries, grinding grooves and tool-making sites, burial and other shell middens, and other artefacts. There have been several engravings and paintings found in rock shelters in the Wolli Creek area (refer to Table 6-15).

Development throughout the late 18th and early 19th century, including construction of the Bardwell Park Station in 1931, meant that the station and immediate surrounds became highly disturbed and modified areas. As such the Proposal area does not contain landscape features that indicate the presence of Aboriginal objects.

6.4.3 Potential impacts

Construction

Construction of the Proposal would involve ground disturbing work including excavation (refer to Section 3.3). Ground disturbing work has the potential to impact Aboriginal heritage sites, if present.

The Proposal is unlikely to have an impact on Aboriginal cultural heritage based on the following considerations:

- the Proposal is unlikely to harm known Aboriginal objects or places
- the AHIMS search did not indicate moderate to high concentrations of Aboriginal objects or places in the study area
- the study area does not contain landscape features, including sandstone rock outcrops, that indicate the presence of Aboriginal objects. This is based on the Office of Environment and Heritage's Due Diligence Code of Practice for the Protection of Aboriginal objects in NSW (2010) and the *Transport for NSW PACHCI* (Transport, 2011)
- the cultural heritage potential of the study area appears to be reduced due to past disturbance.

As such, the Proposal is considered unlikely to harm Aboriginal cultural heritage during construction. However, if unexpected items/finds are uncovered during construction activities, then the *Transport Unexpected Heritage Items Procedure* (2024c) is to be followed.

Operation

No impacts to Aboriginal cultural heritage items are expected as a result of the operation of the Proposal.

6.4.4 Mitigation measures

Standard mitigation measures outlined in Section 7.2 would be implemented to minimise potential impacts to Aboriginal cultural heritage from the Proposal. This would include implementation of the *Transport Unexpected Heritage Items Procedure* (2024c) if any previously unidentified or unexpected potential Aboriginal objects (including skeletal remains) are discovered during construction.

6.5 Non-Aboriginal heritage

6.5.1 Methodology

The potential non-Aboriginal cultural heritage impacts during construction and operation of the Proposal have been assessed as part of the Statement of Heritage Impacts Report (Artefact, 2024).

The preparation of this Statement of Heritage Impact included:

- carrying out desktop searches of the following non-Aboriginal (historic) heritage registers to identify potential listed historic heritage items within or near the Proposal area:
  - World Heritage List
  - Commonwealth Heritage List
  - National Heritage List
  - State Heritage Register
  - TAHE Section 170 Heritage and Conservation Register
  - NSW State Heritage Inventory database
  - Bayside Local Environmental Plan (LEP) (2021)
  - Register of the National Estate
  - National Trust of Australia (NSW) register.
- a review of relevant heritage reports including a review of the Heritage Design Report (prepared by Artefact for Transport for NSW 2023) and background information relevant to the Proposal area
- a site inspection carried out on 30 May 2024 to inform a preliminary assessment of archaeological potential and to identify heritage items and heritage significant fabric that may be affected by the Proposal
- a significance assessment to determine the significance of heritage items and potential archaeological resources in line with the Burra Charter (Australia ICOMOS, 2013)
- identification of the archaeological potential of the Proposal area and determination of the significance of any potential archaeological items
- assessment of the non-Aboriginal heritage impacts of the Proposal in line with the following impact types:
  - physical: impacts resulting from work located within or outside the curtilage boundaries of the heritage item, caused by removing or altering the item or fabric of heritage significance
  - visual: impacts to views, vistas and the setting of the heritage item resulting from proposed works within or outside the curtilage boundaries of the heritage item
  - potential: impacts resulting from increased noise, vibrations and construction work
  - archaeological: impacts to potential archaeological remains
- development of mitigation measures to minimise the impacts of the Proposal on the historical and archaeological significance of the Proposal area.

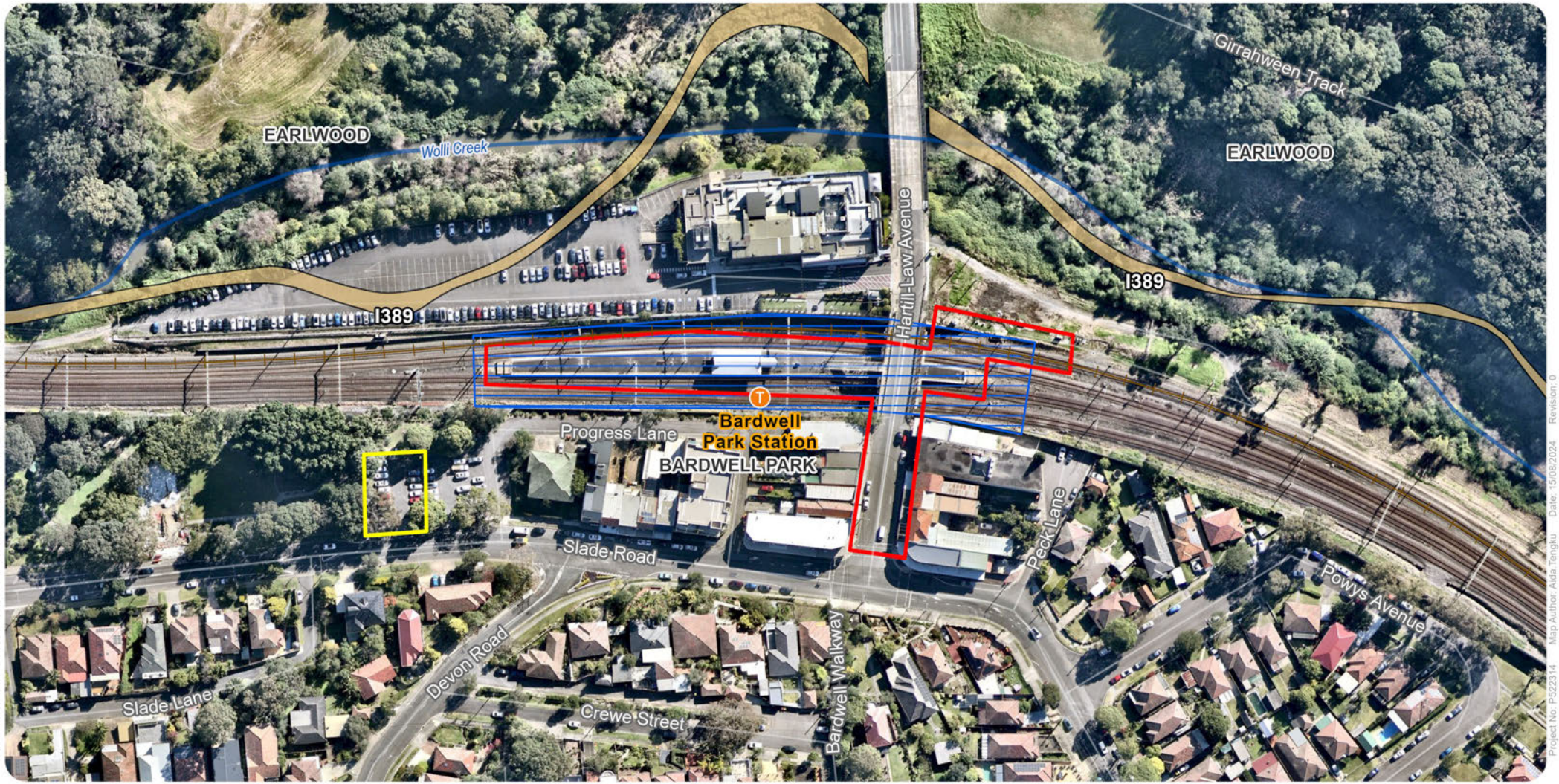
6.5.2 Existing environment

The desktop searches identified the following listed items within the Proposal area:

- Bardwell Park Railway Station Group, which is listed on the TAHE Section 170 Heritage and Conservation Register (#4801896)
- Bardwell Park Urban Conservation Area, which is listed on the Register of the National Estate and the National Trust of Australia NSW Register (non-statutory).

Wolli Creek Valley, which is listed in Bayside Local Environment Plan 2021 (LEP #I389) was identified 100 metres to the north-west of the Proposal area.

The heritage curtilage of Bardwell Park Station under the TAHE Section 170 Register is shown in Figure 6-10.



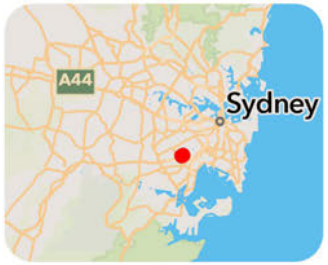
Path: C:\Users\Virgil.Robinson\Aurecon Group\526819 - Safe Accessible Transport program Planning Approvals Contractor - GIS\Pro\P526819_SATP_REF.aprx

Project No: PS22314 Map Author: Aida Tengku Date: 15/08/2024 Revision: 0

Proposal area
Site compound
Train Station
Railway
Watercourse

Heritage

Item - General
Section 170 heritage curtilage



Source: Aurecon, TfNSW, NSW Spatial Services (DCS), ESRI

1:2,000 @ A4

0 25 50 m

Projection: GDA2020 MGA Zone 56

Figure 6-10: Section 170 heritage curtilage

Historical background

At the time of its opening in 1931, Bardwell Park Station was composed of an island platform, platform building, overbridge at Hartill-Law Avenue, and a set of stairs descending from the overbridge to the platform. An electrified line ran through the station from the time of its opening. The original 1931 platform building, which forms part of the current station infrastructure, has a gable roof with stepped parapets and fine decorative brickwork at the east and west ends, as well as soldier lintels on each window. Despite alterations to the station building over time, it still retains much of its original brickwork, decorative and functional elements, and 1930s character. A photo of Bardwell Park Station in 1976 is shown in Figure 6-11.

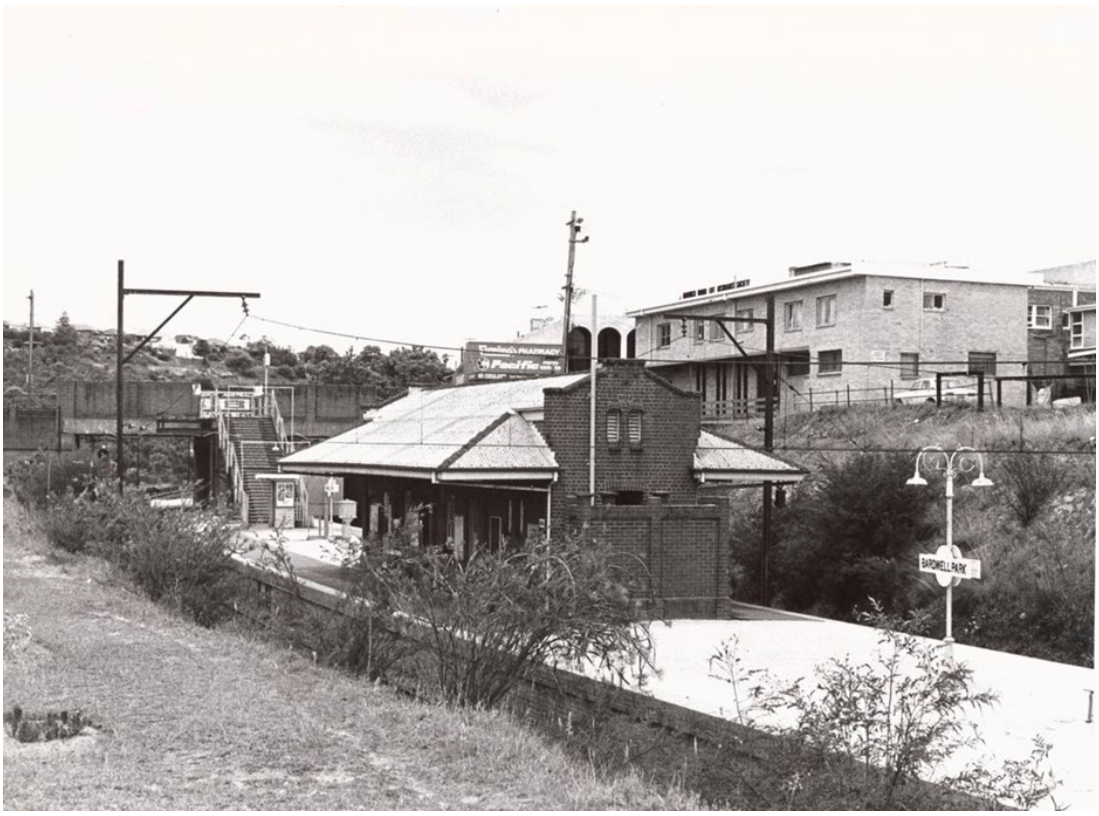


Figure 6-11 Photograph of Bardwell Park Station c. 1976 (State Archives of NSW)

Several alterations have been made to the station since its construction, including:

- removal of the brick safety wall on the original overbridge, and addition of safety screens
- removal of the brick privacy screen leading to the bathrooms on the station building's eastern elevation
- removal of a small, single-person shelter on the western side of the station, and 'Bardwell Park' signs between 1984 and 2007
- addition of a canopy to the eastern elevation of the station building
- addition of new stairs and railing on the overbridge
- addition of concrete retaining walls on either side of the railway tracks
- removal of the corrugated sheeting and terracotta ridge tile capping on the canopy, and replacement with colourbond sheeting.

Bardwell Park Railway Station Group significance

As outlined in the TAHE Section 170 Heritage and Conservation Register, Bardwell Park Railway Station is of local heritage significance. It has historical significance as a major public work completed as an unemployment relief project during the Great Depression, and as a major transport hub for Bardwell Park since 1931. It is of aesthetic significance as an austere 1930s railway building with simple Art Deco detailing and fine brick workmanship that is evocative of the effects of the Depression on building programs for the NSW railways. It is also representative of the cohesive collection of ten East Hills line railway stations from Turrella to East Hills.

Individual elements of the Bardwell Park Railway Station Group have been assessed within the SOHI and a level of significance has been applied. Table 6-16 lists the different elements of the station and provides significance gradings.

Table 6-16 Grading of significance for elements of Bardwell Park Railway Station Group

Heritage element	Assessment	Grading
Station building	The platform building has historical, aesthetic, and representative values at a local level as an example of a 1930s Inter-War suburban station building. Despite alterations, the platform building's exterior has retained a high degree of integrity externally and a moderate degree of integrity internally, with original features including brickwork, art deco detailing, windows, joinery and fitout still present.	High significance
Platform	The original island platform at Bardwell Park Railway Station has aesthetic, historical and research significance as well as representativeness at a local level. This platform is generally intact and combined with the similarly largely intact station building, exemplifies a small Inter-war suburban railway station on the East Hills Line.	Moderate significance
Entry stair structure	The original staircase railings and steps were replaced post-1984, however the steel girder superstructure is original. Based on a comparison with a NSW Railways 1931 plan of Bardwell Park, the new steps and railings generally conform to the original design. The superstructure is the only surviving example of the type of staircase initially installed at the ten East Hills Line stations, making it of significant value for its historical representativeness.	High significance
Overbridge	The overbridge possesses significance at local level for its representativeness, exemplifying overbridge types within the suburban railway network during the 1930s. The overbridge originally featured tall brick parapet walls, which were replaced by safety barriers sometime after 1984. The overbridge was extended to traverse Wolli Creek in 1948 and the brick piers and flat jack arches are original to the 1948 extension.	Moderate significance

Wolli Creek Valley

The Wolli Creek Valley is listed as a local heritage item in the Bayside LEP 2021. It winds east-west adjacent to the railway line. Mapping of the LEP listing shows that Wolli Creek Valley transverses the EBP RSL car park 100 metres north-west of the Proposal area, however the heritage mapping of the creek does not conform to the current physical path of the creek. Wolli Creek was diverted north of its original path by the time the EBP RSL car park was expanded. The present-day creek channel is therefore north of the RSL car park.

6.5.3 Potential impacts

Construction

The construction of the Proposal would result in the removal of the entry stair structure, which would be replaced by a new set of stairs and lift, along with a new elevated walkway with canopies and protection and anti-throw screens. These modifications would have a substantial adverse impact on the on the heritage significance of the original staircase. Interpretive materials, such as historic photos and plans showing the original outline of the staircase may be effective in mitigating the adverse effect of its demolition. The overall impact of the proposed works to the station fabric would be moderate adverse. While there are substantial local adverse impacts to elements of the station, the overall impact is mitigated in part by the application of appropriate scale, form, materiality, and detailing. However, these construction activities are deemed necessary to allow for improved accessibility at Bardwell Park Station and the improved use of the station by all customers.

The construction of the Proposal would also result in heritage impacts to the station building, which is of high heritage significance. Alterations to the heritage fabric would include the partial demolition of the interior of the platform building, including the removal of the existing slab, tiles, doors, fittings and wooden toilet partitions, and creation of a new dividing wall to create the family accessible toilet and unisex ambulant toilet, and the repurposing of two female toilets as a cleaner storage room and staff toilet. The intrusion upon, and loss of, heritage fabric would be offset by the reuse of original materials where possible, along with the use of sympathetic materials and finishes. A further mitigating factor would be the removal of the new canopy which abuts the platform building's eastern end. The overall result would likely be a moderate adverse physical impact on the historical value of the platform building. Although alterations to the station building would result in physical heritage impacts, these changes would allow for customers with accessibility needs to access station facilities more easily and would improve the user experience of the station building for all customers.

Physical heritage impacts would also result from the regrading of the platform, installation of TGSIs along the platform, adjustments of platform furniture, and installation of new canopies over the BAZs. While the asphalt of the platform has low historical significance, the platform light poles with petticoat bases are of high significance to the historic heritage of Bardwell Park Station. These light poles are currently proposed to be removed as part of the Proposal, however their reinstallation is presented as an option in the concept design. The removal of these light poles would result in a moderate adverse impact as they are of high significance to the historic heritage of Bardwell Park Station. New canopies framed in steel and sheeted with a neutral light grey colour (to match the existing platform building roof) would be installed in a series with gaps to help retain the original openness of the platform and keeps the station building and new elements as separate entities. These upgrades would result in minor adverse impacts to the platform surface and moderate adverse impact to the heritage fabric of the platform.

The installation of the new canopies over the platform staircase and street-level entrance would have a moderate adverse impact on the visual setting of the station. Their presence has the potential to significantly alter the appearance of the station as a suburban railway station deliberately designed to suit the aesthetic landscape of the Inter-War period.

Other changes during the construction phase of the Proposal include removal of existing canopies, upgrades to signage, CCTV and the public address system (PA system), which would result in a minor adverse physical heritage impact due to the low to negligible heritage significance of these existing features.

The temporary site compound would have a negligible physical and visual impact as the site is located away from the Bardwell Park Station's heritage fabric. In addition, the site compound would be demobilised following conclusion of the station upgrade works.

Potential impacts to the heritage fabric of the station may occur as a result of using vibratory equipment during construction. Vibration monitoring would be carried out in accordance with the required standards for work in the vicinity of heritage elements to minimise potential heritage impacts. Given the current exposure of heritage elements at the station to rail vibration, this heritage structure is assumed to be structurally sound and unlikely to have an elevated risk from vibration damage as a result of construction activities (refer to Section 6.3.3).

Construction of the Proposal would have a neutral physical and visual impact on the heritage values of Wolli Creek Valley. This is because the creek is over 70 metres from the station building, with EBP RSL and its car park situated between the creek and station.

Intrusive work, such as excavations, geotechnical investigations and trenching have the potential to uncover archaeological remains. The archaeological assessment identified nil to low potential for historical archaeological remains between the 1810s and 1900s due to the high level of disturbance at the site during construction of the rail line and station, along with urban development. However, any intact archaeological remains uncovered during this time-period may be given a local significance rating as it would meet some of the criteria outlined in the *Assessing Significance for Historical Archaeological Sites and 'Relics'.* For remains between the 1920s and the 1950s, there is a moderate to high potential to uncover historical archaeological remains, however such resources are unlikely to add to understanding the period's construction methods of railways so have been given a nil significance rating. Remains uncovered between the 1950s to now are considered extant, they are not considered to be archaeological and are therefore not identified as potential resources.

Operation

A moderate adverse visual and physical impact to the station is anticipated as a result of the Proposal.

The installation of more extensive canopies over the station entry, stairs and platforms would have a moderate adverse impact on the historic visual setting of the station. Although the existing canopy over the ticket window is considered an intrusive element with no heritage significance, the addition of more extensive and modern canopies would impact the platform's existing aesthetic heritage value and would also restrict the visibility of the platform building from the overbridge.

Moderate adverse physical heritage impacts are also anticipated as a result of the new stairs, lift and elevated walkway, which would alter the visual setting for the overbridge and the wider station. Transparent materials would be selected as part of the Proposal where possible to provide high visibility and maintain sightlines of the station, which would contribute to minimising visual heritage impacts.

Other alterations, including internal work within the station building, would result in moderate adverse physical heritage impact and negligible to minor visual heritage impacts.

6.5.4 Mitigation measures

Standard mitigation measures outlined in Section 7.2, along with the mitigation measures set out in the Bardwell Park Station, Safe Accessible Transport Statement of Heritage Impact would be implemented to minimise potential impacts to non-Aboriginal heritage from the Proposal. This would include:

- a Heritage Management Plan and Work Method Statement as part of the CEMP to address heritage impacts and required management procedures to minimise risks
- engaging a Heritage Advisor to provide ongoing heritage, design and conservation advice
- new work being designed with consideration of the architectural style and heritage elements of the station or precinct
- implementation of Transport's *Unexpected Heritage Items Procedure* (2024c) if any previously unidentified or unexpected potential non-Aboriginal heritage items (including skeletal remains) are discovered during construction.

Table 6-17 Site specific non-Aboriginal heritage mitigation measures

No.	Mitigation measure	Responsibility	Timing
50	Mitigation measures in the Bardwell Park Station Upgrade Statement of Heritage Impact (Artefact, 2024) will be implemented.	Contractor	Detailed design, pre-construction, construction, post-construction

6.6 Socio-economic

6.6.1 Methodology

A desktop review of the socio-economic characteristics of the Proposal area and surrounds was carried out. This included a review of:

- existing social infrastructure in the vicinity of the Proposal area including the Bardwell Park and Earlwood suburbs
- data from the Australian Bureau of Statistics (ABS) 2021 Census for the suburb of Bardwell Park
- station entry and exit data from the Transport Performance and Analytics website (2024) for Bardwell Park Station.

6.6.2 Existing environment

Bardwell Park is largely a residential suburb with a small local centre surrounding Hartill-Law Avenue, Slade Road and south of Bardwell Park Station. The nearest residential property to the Proposal is around 20 metres away on Hartill-Law Avenue, with other residential properties located around 70 metres away on Slade Road and Peck Lane. Earlwood is the closest suburb to the Proposal, about 88 metres north of the Proposal area. Earlwood was included as part of this assessment as it has two schools within close proximity to the station, with bus services and routes travelling through Bardwell Park to and from these schools.

The Bardwell Park local centre (less than five metres away from the Proposal area) features a range of shops, including cafes, professional suites, offices, restaurants, hair and beauty stores, pharmacy, a medical centre, post office, newsagency and retail stores. EBP RSL is located north, directly adjacent to Bardwell Park Station.

The closest schools to Bardwell Park Station are the Bardwell Park Infants School (located around 150 metres south), Earlwood Public School (located around 400 metres north-west in Earlwood) and Our Lady of Lourdes Catholic Primary School (located around 460 metres north in Earlwood).

Bardwell Park borders a large area of remnant bushland, the Wolli Creek Valley adjacent to Wolli Creek. Other surrounding recreational areas to Bardwell Park Station include Slade Road Reserve to the south. This reserve offers a range of facilities including picnic areas, bench seating and a playground.

A review of the Australian Bureau of Statistics 2021 Census data indicates the suburb of Bardwell Park has a population of 2,320 people, with the median age range of 42 years old. Of the employed people within Bardwell Park, 4.2 per cent used the train to get to work. The Census identified that the majority of people chose to work from home (42.8 per cent) and drive to work (33.7 per cent). People aged 65 years or over made up about 18.7 per cent of the population of the suburb of Bardwell Park. In terms of family composition, Bardwell Park is mostly made up of couples with children (51.6 per cent).

According to station entry and exit data (Transport Performance and Analytics 2024), the average daily patronage at Bardwell Park Station in 2023 was 960 customers. The station has a number of facilities for customers including a commuter car park managed by Bayside Council (located around 35 metres away), toilets, payphone, Opal card top up or single trip ticket machine, emergency help point and departure indicator screen.

6.6.3 Potential impacts

Construction

The construction phase of the Proposal has the potential to impact station customers, pedestrians, adjacent residents, school students, commercial facilities, motorists and cyclists. A summary of key socio-economic impacts that would result from the construction of the Proposal are summarised in Table 6-18.

Table 6-18 Summary of construction socio-economic impacts

Issue category	Impact	Level of impact
Access and connectivity	• disruptions to pedestrian and traffic flow as a result of the temporary partial and three weekend full road closures of Hartill-Law Avenue. Traffic movements would be maintained where possible, with appropriate detour routes implemented when required (see Figure 6-1 for detour routes) • construction traffic may result in traffic delays and the installation of temporary traffic controls • temporary closure of the station building including the toilet (minimised by installation of a temporary toilet) • pedestrian access to the station would be maintained during road closure and traffic detour periods through the temporary access stairs on the eastern side of Hartill-Law Avenue, opposite the existing station entrance • 19 car parking spaces (three 15-minute timed spaces on Hartill-Law Avenue, 16 spaces within the Slade Road car park) would be temporarily removed for the duration of construction which may have a minor temporary impact. In addition, three spaces within the EBP RSL car park would be removed one day prior to and during rail possessions, which is expected to have a negligible temporary impact.	Short-term / temporary adverse (minor)

Issue category	Impact	Level of impact
Land use changes	• temporary removal of 16 untimed car parking spaces within the Slade Road car park for the duration of construction to facilitate the construction site compound.	Short-term / temporary adverse (minor)
Social infrastructure	• amenity and visual impact to the war memorial as a result of work on the station platform e.g. hoarding, use of plant and equipment, etc • amenity and visual impact to Slade Road Reserve from the temporary site compound.	Short-term / temporary (negligible)
Commercial operations	• minor, localised traffic impacts associated with the delivery of plant and equipment to the station via trucks may impact deliveries to businesses • potential access, parking, noise, visual and air quality impacts to businesses surrounding the Proposal area, including businesses on Hartill-Law Avenue, Slade Road and south of Bardwell Park Station as well as the EBP RSL • short-term potential access disruptions for businesses as a result of temporary road closures on Hartill-Law Avenue and works at bus stops and footpaths.	Short-term / temporary (minor)
Community values, liveability and amenity	• receivers near the Proposal would experience the most impacts to the amenity in the form of noise, visual and air quality impacts • potential sleep disturbance and intrusive noise impacts are expected to be experienced by those closest to the Proposal • visual impacts of construction plant and machinery, including near the site compound, would also impact those living within, visiting and travelling through the Proposal area. Views are expected to be interrupted and altered by construction work and machinery.	Short-term / temporary (minor)

Operation

The Proposal would result in improved safety, connectivity, and inclusivity through the upgrade of station platform facilities, station entry as well as changes to station interchange facilities. A summary of key construction socio-economic impacts that would result from the operation of the Proposal are summarised in Table 6-19.

Table 6-19 Summary of operation socio-economic impacts

Issue category	Impact	Level of impact
Access and connectivity	• improved access to Bardwell Park Station for all customers as a result of the installation of the lift, replacement stairs, platform regrading and installation of tactiles, and improved accessibility at station interchange facilities, including bus stop upgrades, new bicycle hoops, a new pedestrian crossing and the implementation of the accessible parking space and kiss and ride space. • potential increased use of public transport to and from Bardwell Park by a wider demographic including the elderly, people with a disability, people with luggage and prams and families with young children. The Proposal is likely to encourage and see an increase in people with young families use the upgraded station and interchange facilities as over half (51.6 per cent) of the Bardwell Park suburb is made up of couples with children.	Long-term, positive impact (moderate)
Social infrastructure	• placemaking enhancements that consider the war memorial and Connecting to Country.	Long-term, positive impact (minor)
Commercial operations	• parking impacts may have negative impact to commercial operations along Hartill-Law Avenue due to the permanent removal of three 15-minute timed car parking spaces.	Long-term negative impact (minor)
Community values, liveability and amenity	• improved customer amenity and facilities at the station, including a family accessible toilet, unisex ambulant toilet, an accessible water refill station, improved CCTV, improved signage and wayfinding, upgrades to the station PA system, adjustments to furniture and new canopies at the BAZ.	Long-term, positive impact (minor)

6.6.4 Mitigation measures

Standard mitigation measures to address socio-economic impacts are identified in Section 7.2. These mitigation measures are aimed around local goods and services, public feedback, establishing a website for project information, preparing a Community Liaison Management Plan (CLMP), community notification and liaison and complaints management.

6.7 Biodiversity

6.7.1 Methodology

A desktop review was carried out by ecologists to assess potential biodiversity impacts from construction and operation of the Proposal. This assessment was informed by an Arboricultural Impact Assessment Report (Allied Tree Consultancy, 2024).

The following database searches were also carried out to inform potential biodiversity values within the Proposal area:

- BioNet Atlas of NSW Wildlife (EHG, 2024a)
- BioNet Vegetation Classification (EHG, 2024b)
- Protected Matters Search Tool (PMST) (Commonwealth DCCEEW, 2024a)
- Sharing and Enabling Environmental Data (SEED) Portal, the following datasets were consulted: NSW State Vegetation Type Map NSW Extant PCT (DPE, 2023)
- Biodiversity Values Map (NSW DCCEEW, 2024)
- Fisheries NSW Spatial Data Portal (DPI, 2024).
- National Flying-fox monitoring viewer (Commonwealth DCCEEW, 2024b)
- Bayside Council Mapping – Bayside LEP (Bayside Council, n.d.c).

Given the limited extent of impacts expected from the Proposal, no specific ecological field surveys have been conducted.

6.7.2 Existing environment

Landscape context

The Proposal area is located within an urban environment and is surrounded by the rail corridor, Hartill-Law Avenue and various commercial and residential buildings. Wolli Creek Regional Park, which is zoned as C1-National Parks and Nature reserves, is located about 70 metres north from the station (at the closest point), which contains extensive dense native vegetation and appears from photos to have high weed incursion.

No remnant native vegetation appears to remain within the Proposal area. There are two small areas of vegetation within the Proposal area:

- A landscaped area north of the rail line and west of Hartill-Law Avenue, which includes mowed grass and shrubs.
- Two trees located on the southern edge of the rail corridor at Hartill-Law Avenue. These trees have been identified in the Arboricultural Impact Assessment Report as Weeping Red Bottlebrush (*Melaleuca viminalis*). The arborist indicated that mistletoe plants and a vine were present in the canopy of Weeping Red Bottlebrush, but the species was not identified.

The closest waterway to the Proposal area is Wolli Creek, which is about 100 metres north of the Proposal downslope. Recreational areas and parks line Wolli Creek. Within one kilometre of the Proposal area, there are also further nature reserves, parks and outdoor sporting facilities.

No Weeds of National Significance (WoNS) and Priority Weeds (for Bayside Council) have been identified in the Proposal area (Allied Tree Consultancy, 2024).

Biodiversity database assessment

The database searches provide an indication of what species and communities may be present, nearby, or, in the case of fauna, utilising the available environment within the Proposal area.

State Vegetation Type Map NSW

A review of the State Vegetation Type Map NSW extant Plant Community Type (PCT) (DPE, 2023) was conducted on 20 June 2024. This mapping shows the predicted distribution of the vegetation classifications across NSW, describing native plant species assemblages within a local area.

Review of the mapping indicates that no known plant community type (PCT) occurs within the Proposal area. There are several PCTs within 400 metres of the Proposal area. However, it is highly unlikely that any PCTs or associated threatened ecological communities (TECs) would be within the Proposal area as vegetation within the Proposal area are presumed planted and/or regrowth.

Protected Matters Search Tool (PMST)

The PMST search was conducted on 18 June 2024 for a 10 kilometre locality surrounding the Proposal area (Appendix C). The PMST report identified 15 TECs, 33 threatened flora species and 88 threatened fauna species that may occur within the Proposal area.

BioNet Atlas

The BioNet Atlas search of records for the last 20 years was conducted on 11 June 2024 for a 10 kilometre locality surrounding the Proposal area (Appendix D), which identified known records of six threatened flora species and 38 threatened fauna species within the search area. However, no threatened species records were located within the Proposal area. The nearest known records of threatened species are shown in Figure 6-12 and include:

- Large Bent-winged Bat (*Miniopterus orianae oceanensis*) which was recorded about 150 metres from the Proposal area in 2008 and about 500 metres in 2020
- Grey-headed Flying-fox (*Pteropus poliocephalus*) which was recorded within 200 metres of the Proposal area. Over 40 records within two kilometres were recorded between 2007 and 2021
- Southern Myotis (*Myotis macropus)* recorded about 250 metres from the Proposal area in 2019
- Powerful Owl (*Ninox strenua*) recorded about 500 metres from the Proposal area in 2024 and about one kilometre from the Proposal area in 2017
- Magenta Lilly Pilly (*Syzygium paniculatum*) was recorded about 350 metres away from the Proposal area in 2022
- Downy Wattle (*Acacia pubescens*) recorded in 2018 about 850 metres from the Proposal area
- A fungi, *Hygrocybe austropratensis,* has six records between 250 and 500 metres from the Proposal area in 2020.

It is possible that some threatened fauna species, notably the flying species (such as bats and birds) may incidentally use the vegetation in the Proposal area (which includes the mistletoe species and the Weeping Bottlebrush). However, no fauna is expected to depend on this vegetation. As the Proposal area is highly modified and has limited landscaped vegetation and trees, the likelihood of occurrence or presence of threatened flora or fauna is very low.

The species listed below have been recorded within the wider locality on BioNet Atlas:

- Yellow-bellied Sheathtail-bat (*Saccolaimus Flaviventris)*
- Southern Myotis (*Myotis macropus*)
- Greater Broad-nosed Bat (*Scoteanax rueppellii*)
- Little Bent-winged Bat (*Miniopterus australis*)
- Large Bent-winged Bat (Miniopterus orianae oceanensis).

It is possible that microchiropteran bats may be using the human made structures within the Proposal area. This includes concrete crevices, or any cavities in the station structure such as wall or roof cavities.

National Flying-fox monitoring map

The closest nationally important flying-fox camp is about 800 metres from the Proposal area at Wolli Creek. A total of 1320 records of the Grey-headed Flying Fox have been recorded within the 10 kilometre locality. Despite records of the Grey-heading Flying Fox nearby and a camp located near the Proposal, the species is unlikely to utilise the Proposal area. This is due to the limited availability of suitable foraging trees as well as the high disturbance and urbanisation of the Proposal area.

Bayside Council Mapping – Wetlands

A review of the Bayside Council Mapping revealed that there is an area mapped as a Wetland within 100 metres of the Proposal area as part of the Bayside LEP 2021.

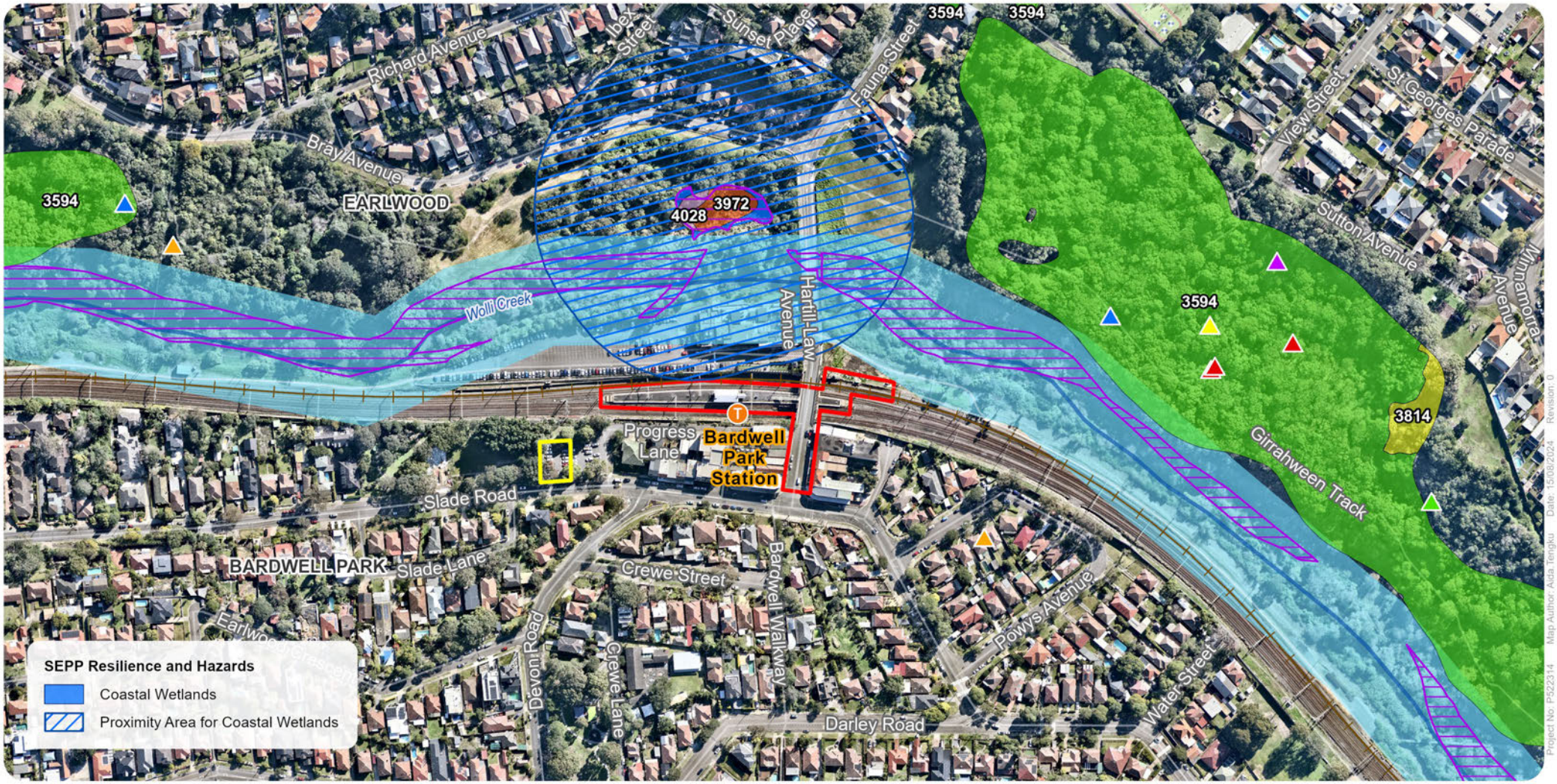
Biodiversity Values Map and SEPP (Resilience and Hazards)

A review of the Biodiversity Values Map on 20 June 2024 indicates that no biodiversity values have been mapped within the Proposal area (NSW DCCEEW, 2024). However, “Biodiverse riparian land” and “Coastal Wetlands” biodiversity values are mapped adjacent to the Proposal as shown in Figure 6-12.

The SEPP (Resilience and Hazards) indicates that a coastal wetland is present in Wolli Creek Regional Park and approximately 87 metres north-west from the Proposal area. The mapped proximity area to this wetland intersects with EBP RSL Club and the associated car park and the northern end of the Proposal area.

Key Fish Habitat

Wolli Creek (adjacent to the Proposal) is also mapped as Key Fish Habitat with a ‘poor’ freshwater fish community status (DPI, 2024).



Proposal area
Site compound
Train Station
Railway
Watercourse
Key Fish Habitat
Biodiversity Values

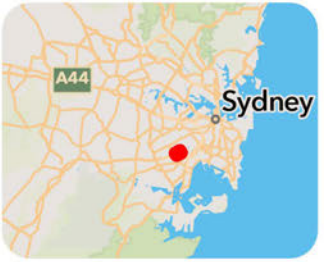
BioNet Atlas

Grey-headed Flying-fox
Large Bent-winged Bat
Magenta Lilly Pilly
Powerful Owl
Southern Myotis
Hygrocybe austropratensis (Common name unavailable)

NSW State Type Vegetation Map

Plant Community Type with labels

PCT 3594 - (Dry Sclerophyll Forests (Shrubby sub-formation)) Sydney Coastal Sandstone Foreshores Forest
PCT 4028 - (Forested Wetlands) Estuarine Swamp Oak Twig-rush Forest
PCT 3972 - (Freshwater Wetlands) Sydney Creekflat Wetland
PCT 3814 - (Heathlands) Woronora Plateau Heath-Mallee



Source: Aurecon, TfNSW, NSW Spatial Services (DCS), ESRI

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Projection: GDA2020 MGA Zone 56

Figure 6-12: Biodiversity existing environment

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Map Author: Aida Tengku Date: 15/08/2024 Revision: 0
Project No: P522314

6.7.3 Potential impacts

Construction

The Proposal would involve the removal of two native trees, as summarised in Table 6-20. Due to the size of the two trees to be removed, eight trees are required to offset this vegetation removal (as noted in Section 6.7.5).

Table 6-20 Trees proposed to be removed within the Proposal area (Allied Tree Consultancy, 2024)

Tree ID	Scientific Name	Common name	DBH (m)	Native or amenity tree	Condition
1	*Melaleuca viminalis* (Syn. *Callistemon viminalis)*	Weeping Red Bottlebrush	0.27-0.24	Native tree	The root mass is assumed to be impacted by the surrounds/ large retaining walls. These are barriers to root extension and these trees appear to have an asymmetrical root system. Significant crown lift pruning has been undertaken and multiple Mistletoe plants are present within the crown. An unidentified vine is encroaching this tree.
2	*Melaleuca viminalis* (Syn. *Callistemon viminalis)*	Weeping Red Bottlebrush	0.33-0.30	Native tree	The root mass is assumed to be impacted by the surrounds/ large retaining walls. These are barriers to root extension and these trees appear to have an asymmetrical root system. Significant crown lift pruning has been undertaken and multiple Mistletoe plants are present within the crown. An unidentified vine is encroaching this tree.

The Arboricultural Impact Assessment Report has identified that the two trees to be removed are impacted by the adjoining retaining wall which would impact their future growth. The removal of two native trees is not expected to have a substantial impact on the overall ecological values of the area as they would not result in the loss of a naturally occurring plant community. The location of vegetation removal is shown in Figure 6-13.

As no vegetation removal is expected to accommodate the temporary site compound, no biodiversity impacts are expected at this location, subject to the implementation of mitigation measures.

Small or difficult to identify threatened flora species that may be within the Proposal area have not been identified through a site visit. However, clearing is limited to two trees disjunct from surrounding patches of native vegetation. As such, impacts to threatened biodiversity are unlikely to occur.

Native and exotic fauna would likely incidentally use the vegetation within the Proposal area. This includes the Grey-headed Flying Fox which relies on important winter and spring feed trees (DAWE, 2021). No important winter or spring feed trees would be removed. However, they are known to feed on Weeping Red Bottlebrushes which are being removed for the Proposal. Subject to the implementation of the mitigation measures, no substantial impacts are expected on the Grey-headed Flying Fox nor other threatened fauna that would incidentally use vegetation within the Proposal area.

Threatened and other native microchiropteran bats may be impacted by the removal of human made structures (such as the existing road over rail bridge) which may be utilised as roosting habitat. Fatality of individuals may occur if no mitigation is implemented prior to work commencing. Impacts would likely be more substantial if work is undertaken in winter as many microbats will torpor/hibernate through winter (e.g., Eastern False Pipistrelle and Large-eared Pied Bat).

Indirect impacts

The Proposal may indirectly impact the establishment and spread of weeds due to the soil disturbance, excavation, and equipment use that could carry weed propagules. These impacts might occur within the Proposal area and adjoining environments, such as Wolli Creek, which may have a negative impact on the native vegetation nearby. If mitigation measures aren't implemented, negative impacts from weeds could extend beyond the direct area of vegetation removal. However, any potential effects on adjacent native vegetation from weed establishment are likely to align with the existing use of the station (e.g., maintenance and regular train movement along the corridor).

While the Proposal does not intersect with any waterways, there are waterways (including waterways containing key fish habitat) downslope of the Proposal. Standard erosion and sedimentation mitigation measures would be implemented to minimise potential impacts to nearby waterways and the coastal wetland. Further assessment on potential hydrology and flooding impacts and mitigation measures have been provided in Section 6.

Construction equipment, vehicle, plant and increased construction personnel would generate a temporary increase in noise, dust and vibration around the Proposal area. As work would predominately be undertaken during standard construction hours (with some night work), impacts from increased light pollution are expected to be minimal. Further, as the Proposal is in an urbanised area, the construction work is not expected to result in a significant change in noise, dust, vibration or light to the extent that there would be substantial impacts on threatened flora or fauna.

Operation

The operation of the Proposal would be largely consistent with the existing use of the station. Increased lighting from the Proposal and any increase in the number of people using the station due to its improved accessibility is not expected to result in any substantial impacts to native fauna. Further, there may be potential positive benefits to flora and fauna with the replacement plantings as required by the *Transport Tree and hollow replacement guidelines* (Transport, 2023b).

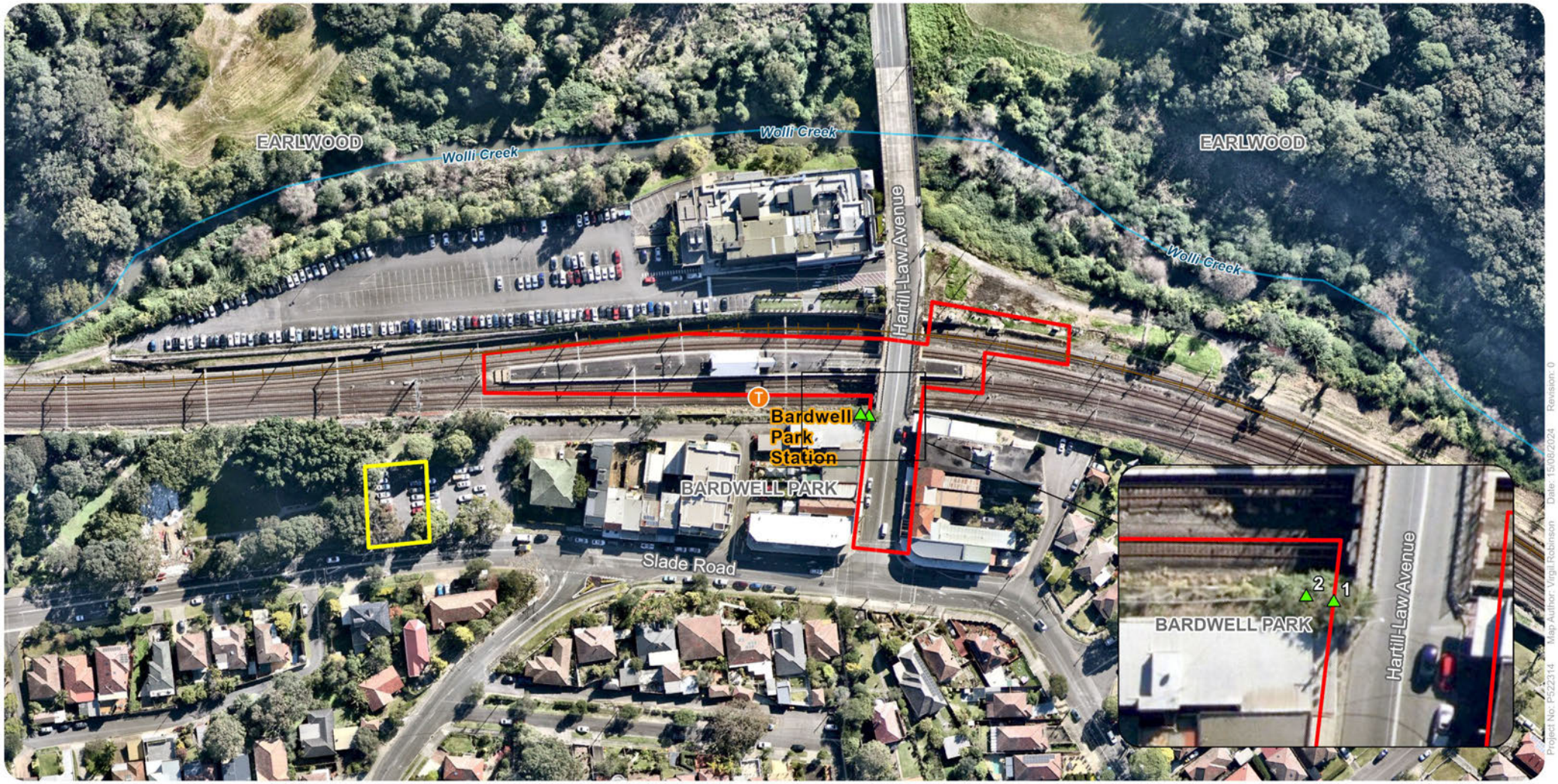
Key Threatening Processes

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

Conclusion on significance of impacts

The Proposal is not likely to significantly impact threatened species or ecological communities or their habitats, within the meaning of the *Biodiversity Conservation Act, 2016* or *Fisheries Management Act 1994* and therefore a *Species Impact Statement* or Biodiversity Development Assessment Report is not required.

The Proposal is not likely to significantly impact threatened species, ecological communities or migratory species, within the meaning of the EPBC Act.



Source: Aurecon, TfNSW, NSW Spatial Services (DCS), ESRI

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Projection: GDA2020 MGA Zone 56

Figure 6-13: Vegetation removal

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Project No: P522314 Map Author: Virgil.Robinson Date: 15/08/2024 Revision: 0

6.7.4 Mitigation measures

Several mitigation measures and safeguards would be implemented to avoid, minimise and offset potential impacts to biodiversity in accordance with Transport guidelines, including measures to manage indirect impacts associated with noise and vibration and dust. Specific mitigation measures are provided in Table 6-21 and standard mitigation measures are provided in Section 7.2.

Table 6-21 Site specific biodiversity mitigation measures

No.	Mitigation Measure	Responsibility	Timing
63	A Flora and Fauna Management Sub-plan (FFMSP) will be prepared as part of the CEMP in accordance with the *Biodiversity Management Guideline EMF-BD-GD-0039* (Transport, 2024a). It will include, but is not limited to: • Plans showing areas to be cleared and areas to be protected • Pre-clearing survey requirements • Unexpected finds protocol • Weed and pathogen management protocols Staff on site during pre-clearing surveys will need to be inducted so that there is an awareness for potential threatened species and their habitat and so that they can appropriately safeguard, manage and relocate any fauna if found during surveys.	Contractor	Pre-construction Construction
64	Pre-clearance surveys shall be undertaken by a suitably qualified ecologist at a minimum for microbats in accordance with *Guide 1: Preclearing process* in Transport's *Biodiversity Management Guideline EMF-BD-GD-0039* (Transport, 2024a). If fauna is encountered, this will be undertaken in accordance with *Guide 9: Fauna handling* in Transport's *Biodiversity Management Guideline EMF-BD-GD-0039* (Transport, 2024a).	Contractor	Pre-construction
65	Should fauna be encountered, Transport's Guide 9: Fauna handling in Transport's Biodiversity Management Guideline EMF-BD-GD-0039 (Transport, 2024a) shall be applied. In the event that threatened species are encountered, Transport's unexpected finds procedure will be followed in accordance with Guide 1: Preclearing process in Transport's Biodiversity Management Guideline EMF-BD-GD-0039 (Transport, 2024a).	Contractor	Construction

6.7.5 Biodiversity offsets

No significant impacts are expected to occur for any nationally-listed threatened species or ecological communities, therefore offsets in accordance with the Biodiversity Assessment Method and Biodiversity Offset Strategy would not be required.

The works would require the removal of two medium native trees. In accordance with the *Transport Tree and hollow replacement guidelines* (Transport, 2023d), trees should be replaced as per the second column in Table 6-22.

Due to the removal of two medium trees, a total of eight replacement trees are required to be planted for the Proposal.

Table 6-22 Tree and Hollow Replacement Guidelines (Transport, 2023c) replacement requirements

Tree size	Tree replacement requirements
Very large (DBH over 100 cm)	Plant minimum 16 trees
Large (DBH between 50 and 100 cm)	Plant minimum eight trees
Medium (DBH between 20 and 50cm)	Plant minimum four trees
Small (DBH between 5 and 20cm)	Plant minimum two trees
Hollow	Three artificial hollows for every occupied hollow removed

6.8 Contamination, landform, geology and soils

6.8.1 Methodology

The assessment has been informed by a Preliminary Site Investigation (PSI) by Cardno (now Stantec) (2022). The primary objective of the PSI was to assess whether soil contamination has the potential to exist on site and whether further investigation is needed to determine the extent of any contamination. The PSI included a site investigation with limited intrusive sampling of two geotechnical boreholes.

A desktop review was also carried out to determine the landform, geology and soil characteristics of the Proposal area and its surrounds including a review of relevant geology, soils and contamination databases.

6.8.2 Existing environment

The Proposal is underlain by alluvial terrace deposits of sand and gravel, and Hawkesbury Sandstone. It is mapped on Gymea landscape, which comprises undulating to rolling rises and low hills on Hawkesbury Sandstone, with shallow to moderately deep (30-100 cm) Yellow Earths and Earthy Sands on crests and inside of benches.

A review of the NSW EPA Contaminated Land Register and List of Notified Sites on 28 June 2024 indicated that the Proposal area is not listed as a contaminated site, nor has the site been subject to any regulation under the *Contaminated Land Management Act 1997*. The closest site on the Contaminated Land Register is 61 Turrella Street, Turrella, which is approximately two kilometres east of the station. The closest site on the List of Notified Sites, for which regulation under the *Contaminated Land Management Act 1997* is not required, is 7-Eleven Bexley, approximately 2.2 kilometres south of the Proposal.

Bardwell Park Station is not on mapped areas of acid sulfate soils, however there is “low probability” of acid sulfate soils occurring one to two metres below the existing surface surrounding the station to the north (Aurecon, 2023b).

Bardwell Park Station has been in operation since 1931 and alterations to the station building was carried out from the 1980s to 2000s. The PSI identified the following potential sources of contamination within the Proposal area:

- historical use of uncontrolled fill materials in the rail corridor
- historical railway activities including asbestos train breaks, diesel fuel leakages and leaded fuel emissions
- offsite historical petroleum storage and distribution activities.

Based on these sources, potential contaminants within the Proposal area include:

- those associated with railway yards, as identified by Australian Standard AS 4482. 1-2005 – Guide to the investigation and sampling of sites with potentially contaminated soils – Non-volatile and semi-volatile compounds, including:
  - hydrocarbons
  - arsenic
  - phenolics
  - heavy metals
  - nitrates and ammonia
  - hazardous building materials (including asbestos, lead paint, polychlorinated biphenyls and synthetic mineral fibres).
- those associated with uncontrolled fill material, including:
  - total petroleum hydrocarbons
  - benzene, toluene, xylene and naphthalene
  - polycyclic aromatic hydrocarbons
  - heavy metals
  - asbestos containing materials
  - organochloride and organophosphate pesticides.
- those associated with petroleum storage and distribution, including:
  - heavy metals
  - total petroleum hydrocarbons
  - benzene, toluene, xylene and naphthalene
  - polycyclic aromatic hydrocarbons.

Of the soil samples analysed in the PSI no exceedances of the adopted Tier 1 human health and ecological criteria for commercial/ industrial land use were identified. In addition, no asbestos was detected within any sample. No potential asbestos in building materials was observed, however there is potential for asbestos containing material to be present within the station building.

6.8.3 Potential impacts

Construction

During construction of the Proposal, excavation and other earthwork for construction of the new lift shafts and platform canopy footings, removal of the existing stairs, kerb modifications and trenching for electrical upgrades would result in the greatest levels of ground disturbance. These excavation works have the potential to result in erosion and sedimentation impacts from exposed soil and stockpiled material (including at the proposed site compound).

Excavation work has the potential to expose contaminants which could present a health risk to people in the vicinity of the work if not adequately managed. The exposure of contaminants would also present an environmental risk associated with contaminants entering nearby waterways via the stormwater network. The proposed work within the station building also has the potential to disturb hazardous substances, such as asbestos or lead paint (subject to a hazardous building material survey). Construction plant and equipment has the potential to contaminate soil through accidental fuel or chemical spills. However, these potential contamination impacts would be managed with the implementation of standard mitigation measures outlined in Section 7.2.

Operation

Operation of the Proposal is not expected to result in any notable impacts to contamination, geology and soils.

6.8.4 Mitigation measures

Standard mitigation measures that would be implemented to address contamination, landform, geology and soil impacts are detailed in Section 7.2. This includes:

- measures for the storage and use of hazardous materials during construction
- erosion and sediment control measures in accordance with Managing Urban Stormwater: Soils and Construction Volume 14th Edition (Landcom, 2004)
- a hazardous materials survey prior to the removal of the existing station entry stairs and station building modifications
- further site investigations of the Proposal area prior to construction, including as recommended by Bardwell Park Station Preliminary Site Investigation (Stantec, 2022), to determine the extent of any contamination and measures to manage potential contamination or asbestos identified during construction.

Investigation of potential contamination would be carried out before the establishment of the site compound and during site demobilisation.

6.9 Hydrology and flooding

6.9.1 Methodology

A desktop hydrology and flooding study was carried out for the concept design development to identify existing flood behaviour (up to a 1% annual exceedance probability (AEP)) and the potential impacts of the Proposal on flood conditions. The results of the hydrology study were used to inform the drainage and stormwater requirements of the design. The hydrology study primarily adopted information from the Bardwell Creek 2D Flood Study Review Final Report (WMAwater, 2019).

Information on groundwater within the Proposal area was obtained from data collected from a monitoring well installed during an intrusive geotechnical investigation for the Proposal (Aurecon, 2023b).

6.9.2 Existing environment

Wolli Creek is about 100 metres north of Bardwell Park Station.

The desktop hydrology study identified that the station platform is not inundated in 1% AEP flood events, however, railway tracks around the platform are subjected to riverine flooding from Wolli Creek as well as the local runoff. The water level at the station can potentially reach up to 7.35 metres AHD in a 1% AEP event with the addition of 30 per cent rainfall to account for climate change. The existing platform height is 7.83 metres AHD.

The desktop hydrology study also identified that overtopping of the railway embankment can occur from events as frequent as 20% AEP. This occurs when overbank flows from Wolli Creek inundate the railway tracks at the low point adjacent to a bend in the creek upstream of the station. The railway line was inundated at Bardwell Park Station during the October 2014 and April 2015 intense rainfall events. Figure 6-14 shows the impact and height of flooding at Bardwell Park Station during the October 2014 intense rainfall event. Flooding at Bardwell Park Station in 2014 resulted in train closures in both directions and significant transport disruptions.

There is no existing surface drainage on the platform surface and the existing platform surface does not provide crossfalls graded away from the platform edges.

The standing groundwater level in the monitoring well installed to the north of the rail line, east of Hartill-Law Avenue, was five metres below ground level on 3 November 2022 (Stantec, 2022).

In addition, future projected climatic conditions indicate that rainfall events are predicted to reduce in frequency and duration but increase in rainfall intensity (refer to Section 6.11 for information on Climate resilience).

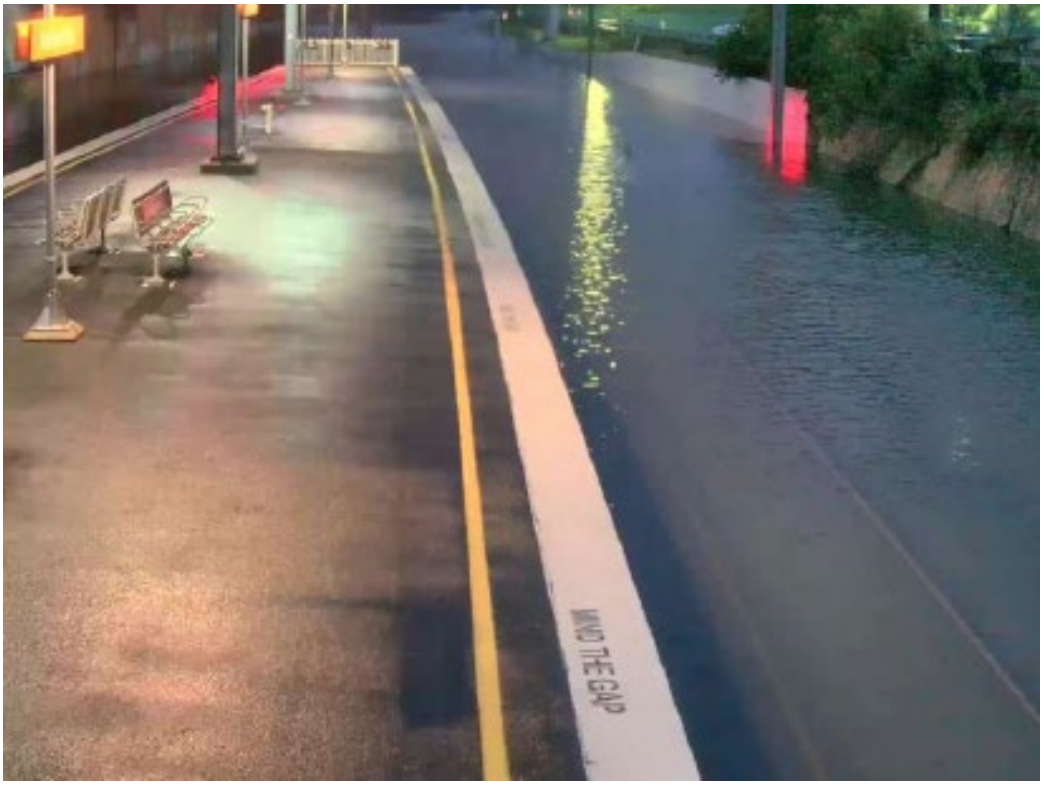

Figure 6-14 Bardwell Park Station during the October 2014 flood event

6.9.3 Potential impacts

Construction

Construction and excavation work have the potential to generate erosion and sediment impacts to Wolli Creek and areas of mapped coastal wetland under the SEPP (Resilience and Hazards) (see Section 6.7.2). Any potential impact would most likely occur during a high rainfall event that would increase water flows through the Proposal area. However, it is unlikely that Wolli Creek and areas of mapped coastal wetland would be adversely impacted by the Proposal as they are located over 100 metres away and any potential impacts would be minimised through implementation of erosion and sediment controls (see Section 7.2). As such, any residual impact following implementation of mitigation measures would be minor and localised.

The Proposal area and site compound are outside the 1% AEP flood extent, meaning it is unlikely there would be flood impacts in these areas during high rainfall events. However, Slade Road and

sections of Progress Lane have the potential to be impacted by 1% AEP flood events, which may restrict access to the site compound and disrupt construction activities during these times.

There is also a potential impact from accidental spills or inadequate fuel and chemical storage practices resulting in localised contamination of local water quality. With the implementation of standard mitigation measures identified in Section 7.2, this potential impact is expected to be minor.

The new lift shaft would require an excavation depth of approximately 1.4 metres. The depth of the platform foundations and pile caps would be determined during detailed design. It is unlikely the Proposal would intercept groundwater during most earthworks and excavation activities due to the recorded standing groundwater level near the Proposal. Minor volumes of groundwater may enter deeper excavations, if during detailed design it is identified that deeper excavation depths are required. While this could lead to leaching of pollutants to groundwater, large volumes of dewatering or groundwater extraction is unlikely to be required. Should groundwater be encountered during excavation, it would be managed in accordance with Transport and NSW EPA guidelines.

Operation

The Proposal would result in minor adjustments to stormwater drainage, including provision of new stormwater drainage connections from the new canopies, lift roof and elevated walkway, and connecting new kerbs along Hartill-Law Avenue to the existing drainage system. As these connections would generally be providing like-for-like connections to the existing stormwater drainage network, the upgrades are not expected to substantially increase the volume of water entering the local stormwater drainage network.

The Proposal would include platform regrading along the entire length of the platform. It is assumed that this minor platform regrading would have no significant impact to track drainage as they are minor changes in gradient compared to the existing platform.

Footpath upgrades on Hartill-Law Avenue, including minor widening and regrading, and associated regrading of the road, are also assumed to have no significant impact on local runoff as they are limited in extent and gradient changes appear to be outside the 1% AEP extent.

Overall, the Proposal is anticipated to have little impact on the hydrology of the surrounding area. The Proposal would not lead to a substantial increase in impervious surfaces compared to the existing conditions. Impacts on hydrology and flooding would be limited to the minor changes to stormwater drainage, regrading and widening of the footpath on Hartill-Law Avenue.

6.9.4 Mitigation measures

Standard mitigation measures to address hydrology, flooding, surface water and groundwater impacts are identified in Section 7.2, including procedures for appropriate storage and use of hazardous materials and refuelling of vehicles during construction and erosion and sediment control measures for the mitigation of water quality impacts during construction in accordance with Managing Urban Stormwater: Soils and Construction Volume 14th Edition (Landcom, 2004).

6.10 Greenhouse gas

6.10.1 Methodology

Transport generally utilises the Transport Carbon Tool for tracking and reporting carbon throughout design and construction phases of project development. Transport Carbon Tool has been designed to help standardise greenhouse gas assessment and reporting throughout project delivery. The tool assesses scope 1, scope 2 and scope 3 emissions. The three scopes as defined by the National Greenhouse Emissions Reporting Scheme (Clean Energy Regulator, 2023) are described in Table 6-23 below.

Table 6-23 Greenhouse Gas (GHG) emission scopes

Emission	Definition
Scope 1	Scope 1 GHG emissions are the emissions released to the atmosphere as a direct result of an activity, or series of activities at a facility level related to the Proposal. Scope 1 emissions are sometimes referred to as direct emissions.
Scope 2	Scope 2 GHG emissions are the emissions released to the atmosphere from the indirect consumption of an energy commodity. For example, 'indirect emissions' come from the use of electricity produced by the burning of coal in another facility.
Scope 3	Scope 3 GHG emissions are indirect GHG emissions other than scope 2 emissions that are generated in the wider economy. They occur as a consequence of activities of a facility, but from activities not owned of controlled by the facility's business, for example the extraction and production of purchased materials.

The GHG emissions from construction of the Proposal have been estimated using the Transport Carbon Tool. Energy and GHG reduction reporting would be undertaken during detailed design and construction.

6.10.2 Existing Environment

The transport sector accounts for 19 per cent of NSW's greenhouse gas emissions. Although 77 per cent of the transport sector emissions are associated with users of the road network, Transport's direct operations account for only five per cent of the sector emissions.

6.10.3 Potential Impacts

Construction

The construction of the Proposal would result in the generation of GHG emissions through:

- minor vegetation removal (removal of two native trees) within the Proposal area reducing the carbon sequestration capacity of the local environment
- the decomposition of green waste and mulch, releasing carbon dioxide
- direct emissions of carbon dioxide, methane and nitrous oxide from the use plant and equipment emitting exhaust fumes
- usage of electricity from fossil fuels
- production and use of materials that have high embodied energy content such as concrete.

Most of these emissions would be Scope 1 emissions from diesel consumption for site vehicles and mobile site and equipment.

It is noted that Sydney Trains network operates with net zero emissions from electricity consumption. Electricity sourced from the network during construction would result in lower levels of generation of GHG emissions.

Operation

During the operation of the Proposal, GHG emission sources would include:

- use of the Proposal by vehicles
- maintenance of the Proposal which includes infrastructure repairs and fuel use for the operation of the plant and equipment to perform the maintenance activities.

6.10.4 Mitigation measures

Opportunities to reduce emissions associated with both construction and operation would be investigated and implemented throughout detailed design and construction. Standard mitigation measures to address greenhouse gas impacts are identified in Section 7.2, including the requirement to carry out a carbon footprint exercise during detailed design using the Transport Carbon Tool.

6.11 Climate resilience

6.11.1 Methodology

The following section describes the climate risks and impacts that may occur when constructing and operating the Proposal. The assessment has been informed by a detailed Climate Risk assessment undertaken during concept design.

The risk assessment has followed the procedures outlined by the TfNSW Climate Risk Assessment Guidelines (Transport, 2021a). Transport's climate change risk assessment is generally described in Table 6-24.

Table 6-24 Climate change risk assessment approach (Transport for NSW)

Type	Assessment step	Mitigation Measures
Climate risk pre-screening	Pre-screening	The first stage of the pre-screening process determines whether the project is likely to be impacted by climate change, through assessing historical and current exposure.
	Risk screening	The second stage of screening aims to identify potential exposure to relevant future climate change impacts.
	Risk assessment	Formulate the risk scenarios using the relationships identified in the pre-screening and risk screening stage. Each risk scenario is then analysed in detail by assigning a 'likelihood' and 'consequence' rating. Existing controls/standards should be identified and residual risk ratings selected.
Detailed climate risk assessment and evaluation (undertaken where the screening identifies extreme, very high or high risks)	Risk evaluation	The purpose of risk evaluation is to identify which of the risks require treatment. Treatments designed to mitigate the risks should be applied to residual risks evaluated as extreme or high. Risks evaluated as negligible or low do not require any further consideration.
	Risk treatment / adaptation	Involves the development of risk treatments that can reduce the residual risk rating so that at a minimum, no high, very high, or extreme risks remain after an adaptation pathway has been identified.

6.11.2 Existing environment

Existing conditions

Globally average air temperature has warmed by over 1.2 ± 0.1 °C since records began in 1850 (based on 2020 data). Despite La Niña cooling conditions, 2020 was one of the three warmest years on record and the last decade is the warmest on record.

Increasing global mean temperatures and changes to the average climate system, driven primarily by higher carbon dioxide levels due to human influence, lead to higher frequency and intensity of extreme weather events globally and in Australia. Significantly, the projected recurrence and intensity of extreme weather events can occur much faster and have a more significant impact than changes to the average climate system state. In Australia, nine out of the top ten warmest years ever recorded have occurred since 2005, with 2019 marking the warmest year on record for NSW. Penrith in western Sydney reached 48.9 °C on the 4th of January 2020, the highest observed in an Australian metropolitan area. Climate change has impacted Australia and NSW by increasing the severity and frequency of heatwaves, bushfires, extreme rainfall, flooding and landslides, drought, and extreme winds and cyclones.

Sydney's climate is characterised as warm temperate, meaning the region has a low daily temperature range and four distinct seasons. Mild winters with low humidity as well as hot to very hot summers with moderate humidity can be experienced. Average annual rainfall is highly variable across the NSW region, with Sydney being higher than average at just over 1,150 millimetres annually due to its coastal location. An assessment of heat vulnerability was carried out for Bardwell Park Station as part of the Detailed Climate Risk Assessment Report (Aurecon, 2024). The Heat Vulnerability Index (HVI) indicates vulnerability to urban heat island impacts based on exposure, sensitivity, and adaptive capacity and provides a ranking from 0 to 5 (high exposure, high sensitivity and low adaptive capacity). Bardwell Park Station has a HVI score of 2.

Climate change is predicted to increase the Urban Heat Island effect within urbanised areas. During summer in 2015-2016, Bardwell Park Station had a warmer temperature than a non-urban vegetation reference indicating it may be subject to this effect.

Bardwell Park Station was assessed against the Australian Disaster Resilience Index. The index assesses disaster resilience using factors that account for resource availability and ability to prepare for, absorb and recover from natural hazards. The station was ranked 0.8 (High) which means that communities have better capacity to use available resources to cope with adverse events, and enhanced capacity to adjust to change through learning, adaptation and transformation.

The station is located within mapped flood affected land (refer to Section 6). However, it is not within any areas of mapped Bushfire Prone Vegetation and therefore not at risk from any major bushfires.

Future projected conditions

The parameters which are likely to change over time and across the design lifecycle of the Proposal include:

- temperatures are projected to rise
- rainfall events are predicted to reduce in frequency and duration but increase in rainfall intensity
- increase in hail frequency
- droughts are likely to occur more frequently and for a longer duration
- increased drought conditions
- soil moisture content would decrease for longer durations
- wind speed and frequency of dangerous wind speeds occurring are projected to stay mostly unchanged.

6.11.3 Potential Impacts

Construction

The potential impacts of climate change are expected to be minimal due to the relatively short timeframe of the construction phase of the Proposal, as described in Section 3. For this reason, a risk assessment for the construction phase of the Proposal was not warranted.

Transport standard risk management controls carried out during construction would be sufficient to manage any risk associated with current climatic conditions. This includes measures such as ceasing work due to extreme heat conditions, hail and heavy rainfall.

Operation

The heat-related risks are associated with heating of surfaces on hot days, creating a hazard for customers and staff, pedestrians and cyclists. These risks would be minimised through the replacement of canopies, increase in canopy cover on the platform and replacement tree planting.

The extreme rainfall risk is associated with flooding impacts to rail infrastructure. The current high-voltage equipment in the rail corridor is relatively unprotected and it is likely it would be impacted during intense rain events. The proposed high-voltage padmounts would have footings below the 1% AEP flood level. However, the height of these proposed padmounts would be reviewed during detailed design. The likelihood of flood water rising above the platform level (where the majority of scope items are located) is less than 1 in 100 years.

6.11.4 Mitigation measures

Standard mitigation measures to address climate change impacts are identified in Section 7.2. These mitigation measures are aimed at reducing the Proposal's carbon footprint.

6.12 Other impacts

The following section describes other impacts that may occur when constructing and operating the Proposal.

6.12.1 Existing environment and potential impacts

Table 6-25 summarises other potential impacts of the Proposal including in relation to waste and resource use, air quality and hazards and risks.

Table 6-25 Other potential impacts

Environmental factor	Existing environment	Potential impacts
Waste and resource use	Bardwell Park Station currently contains general waste bins and recycling bins on the platform. Additional general waste bins are located near the bus stops along Hartill-Law Avenue as well as near the Council parking area located on Slade Road. Waste produced as part of the Proposal would be removed from site by licenced waste contractors and disposed of at licenced waste facilities.	**Construction** During construction of the Proposal, the following waste materials would be generated: • demolition waste (brick, concrete, steel, asphalt) • excavated spoil • building material wastes (including metals, timbers, plastics, packaging, fencing etc) • surplus building materials • electrical wiring and conduit waste (from electrical connections and utility relocation) • green waste (including mulch from tree removal and weeds) • general waste, including food scraps generated by construction workers. As outlined in Section 7.2, waste would be reused or recycled where possible. **Operation** The Proposal is not anticipated to result in increased waste during operation. Bins would be reinstated as required on the platform.

Environmental factor	Existing environment	Potential impacts
Air quality	Based on existing land uses surrounding the Proposal area, the existing air quality is characteristic of an urban environment, with some transport emission influences. NSW Environment and Heritage undertakes air quality monitoring across NSW. The Proposal is located within the east Sydney monitoring region with air quality monitored at fixed sites. Earlwood is the closest monitoring site to the Proposal. A search of the daily regional air quality index for the East Sydney region on 27 June 2024 shows that the region experienced 'Good' air quality values. Receivers that may be potentially sensitive to air quality impacts from the Proposal include: • patrons at Bardwell Park Station • local residents • customers of the Bardwell Park Shopping Village • customers of the EBP RSL Club • pedestrians walking along Hartill-Law Avenue and other nearby streets.	**Construction** Construction activities for the Proposal may result in the generation of dust and emissions from on-site machinery and associated vehicular from: • loading and transfer of materials from trucks • use of on-site machinery and vehicles • excavation of the new lift shafts and Platform canopy footings, removal of the existing stairs, kerb modifications and trenching for electrical upgrades • platform building modifications and platform regrading. However, the construction of the Proposal would have minimal air quality impacts as any dust or emissions are anticipated to be localised, short-term and minor. Appropriate measures would be implemented to manage dust impacts from excavations. **Operation** The operation of the Proposal is not anticipated to result in large increases in customers at Bardwell Park Station. However, growth in commercial and residential development is expected for the Bardwell Park area, which would increase patronage at the station over the long term. This increased patronage is not anticipated to result in significant air quality impacts in the station area.

Environmental factor	Existing environment	Potential impacts
Hazard and risk	The Proposal area is not located on land mapped as bushfire prone land. The nearest section of mapped bushfire prone land is over eight kilometres south-west of the Proposal area. As noted in Section 3.5, utilities including water and communication services pass through the Proposal area. Existing hazards at Bardwell Park Station include the potential for customers to fall from the platform onto the railway tracks and hazards associated with pedestrians walking along Hartill-Law Avenue near moving vehicles. Additionally, the existing stair-only access to the station, as well as the uneven platform grade and the step leading to the existing toilets presents hazards for customers with accessibility needs.	**Construction** Construction activities that may increase bushfire risk during construction include mulch stockpiling, hot work such as welding and fuel/chemical storage. As these activities would occur within the Proposal area and the site compound away from bushfire prone land, and there is no contiguous vegetated connection to bushfire prone land, the Proposal is not expected to result in bushfire impacts. There may be temporary disruption to utilities during construction where relocation is required. This would be managed in consultation with utility providers to minimise disruptions to customers. **Operation** The operation of the Proposal would reduce safety hazards for customers with accessibility needs. The construction of lift access and new DSAPT compliant stairs to the platform would improve safe access to the station for all customers, while the regrading of the platform would reduce existing risks for customers with accessibility needs during operation of the Proposal. Other Proposal features such as platform TGSIs, hearing induction loops and the addition of multiple canopies at the BAZ would also reduce safety risks for customers with accessibility needs. The Proposal would not result in permanent changes to bushfire impacts or ongoing utilities during operation. Standard mitigation measures to address hazards and risk impacts would be incorporated into the CEMP, as outlined in Section 7.2.

Environmental factor	Existing environment	Potential impacts
Waste and resource use	Bardwell Park Station currently contains general waste bins and recycling bins on the platform. Additional general waste bins are located near the bus stops along Hartill-Law Avenue as well as near the Council parking area located on Slade Road. Waste produced as part of the Proposal would be removed from site by licenced waste contractors and disposed of at licenced waste facilities.	**Construction** During construction of the Proposal, the following waste materials would be generated: • demolition waste (brick, concrete, steel, asphalt) • excavated spoil • building material wastes (including metals, timbers, plastics, packaging, fencing etc) • surplus building materials • electrical wiring and conduit waste (from electrical connections and utility relocation) • green waste (including mulch from tree removal and weeds) • general waste, including food scraps generated by construction workers. As outlined in Section 7.2, waste would be reused or recycled where possible. **Operation** The Proposal is not anticipated to result in increased waste during operation. Bins would be reinstated as required on the platform.

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6.12.2 Mitigation measures

Standard mitigation measures identified in Section 7.2 would be implemented to minimise impacts to waste and resource use, air quality and hazards and risk as part of the Proposal.

6.13 Cumulative impacts

6.13.1 Study area

The cumulative impact assessment has considered projects within the suburb of Bardwell Park and Earlwood.

6.13.2 Broader program of work

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

The nearest stations proposed to be upgraded as part of the Safe Accessible Transport program are Chester Hill Station (located around 13 kilometres north-west), Lewisham Station (located around 14 kilometres east) and Macquarie Fields Station (located around 23 kilometres south-west).

6.13.3 Other projects and developments

A search of the Department of Planning and Environment's Major Projects Register and the Bayside Council Development Application Register on 28 June 2024 identified no projects with the potential for substantial cumulative impacts alongside the Proposal.

The Traffic, Transport and Access Impact Assessment (Aurecon, 2024a) completed for the Proposal identified a future project outside Bardwell Park and Earlwood. Canterbury-Bankstown Bulldogs Centre of Excellence (SSD-69627466) is about three kilometres northwest of the Proposal. An EIS is currently being prepared for this project. Negligible cumulative impacts are anticipated given consideration of its timing and location relative to the subject Proposal.

6.13.4 Mitigation measures

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

7. Environmental management

This chapter describes how the Proposal would be managed to reduce potential environmental impacts during detailed design, construction and operation. A framework for managing potential impacts is provided. A summary of site-specific environmental mitigations is provided and the licence and/or approval requirements required prior to construction are listed.

7.1 Environmental management plans (or system)

Mitigations measures have been identified in the REF in order to minimise adverse environmental impacts, including social impacts, which could potentially arise as a result of the Proposal. Should the Proposal proceed, these mitigations measures would be incorporated into the detailed design and applied during the construction and operation of the Proposal.

A Construction Environmental Management Plan (CEMP) would be prepared to describe the mitigations measures identified. The CEMP would provide a framework for establishing how these measures would be implemented and who would be responsible for their implementation.

The CEMP would be prepared prior to construction of the Proposal and must be reviewed and certified by the TE&SR, prior to the commencement of any on-site works. The CEMP would be a working document, subject to ongoing change and updated as necessary to respond to specific requirements. The CEMP would be developed in accordance with the specifications set out in mitigation measure 1.

7.2 List of mitigation measures

Mitigation measures outlined in this REF would be incorporated into the detailed design phase of the Proposal and during construction and operation of the Proposal, should it proceed. These mitigation measures would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. The mitigation measures are listed in Table 7-1.

Table 7-1 Mitigation measures

No.	Mitigation measure	Responsibility	Timing
General			
1.	**Construction Environmental Management Plan** A Construction Environmental Management Plan (CEMP) shall be prepared and implemented prior to the commencement of construction which addresses the following matters, as a minimum: a) project risk assessment including environmental aspects and impacts b) high level traffic and pedestrian management (noting a separate Traffic Management Plan (TMP) may be required subject to other Transport requirements) c) urban design, landscape character and visual amenity d) noise and vibration management, including traffic noise generated by the Proposal e) water and soil management (including flood and high rainfall event management) f) air quality management (including dust suppression) g) Aboriginal and non-Aboriginal heritage management h) biodiversity management i) storage and use of hazardous materials j) contaminated land management (including acid sulfate soils) k) weed management l) waste management m) bushfire risk n) environmental incident reporting and management procedures o) non-compliance and corrective/preventative action procedures p) details of approvals, licences and permits required to be obtained under any other legislation for the Proposal. The CEMP shall: i. detail how the Contractor shall comply with the Conditions of Approval, Mitigation Measures, conditions of any licences, permits or other approvals issued by government authorities for the Proposal, all relevant legislation and regulations, and accepted best practice management ii. comply with the relevant requirements of *Environmental Management Plan Guideline – Guideline for Infrastructure Projects* (NSW Department of Planning Industry and Environment, 2020)	Contractor	Pre-construction

No.	Mitigation measure	Responsibility	Timing
	iii. include an environmental compliance matrix for the Proposal (or such stages of the Proposal as approved by the Transport Environment and Sustainability Representative (TESR)) that details compliance with all relevant conditions and mitigation measures iv. include an Environmental Policy. The CEMP shall be reviewed and updated at six monthly intervals (unless otherwise approved with the TESR) and in response to any actions identified as part of the TESR's review of the document or in response to scope changes or modifications. Updates to the CEMP shall be made within seven days of the completion of the review or receipt of actions identified in the Transport review of the document. The CEMP must be approved by the DES or delegate prior to the commencement of construction and following review, and be implemented for the construction.		
2.	**Environmental Controls Map** An Environmental Controls Map (ECM) shall be prepared in accordance with Transport's Environmental controls map guideline (Transport, 2023) prior to the commencement of construction for implementation for the construction. The ECM is to be approved by the TESR and may be prepared in stages, as set out in the CEMP. A copy of the ECM shall be submitted to the TESR for review and written approval in accordance with Mitigation Measure 4 The ECM shall be prepared as a map – suitable for enlargement to both A0 and A3 sizes to be mounted on the wall of a site office and included in site inductions, supported by relevant written information. Updates to the ECM shall be made within seven days of the completion of the review or receipt of actions identified by any TESR audit of the document and submitted to the TESR for written approval.	Contractor	Pre-construction
3.	**Site Induction** Prior to the commencement of construction, all contractors will be inducted on the key project environmental and sustainability risks, procedures, mitigation measures and conditions of approval. The induction shall be given by the Environmental Personnel and as a minimum will include: • details of the approved ECM as required by Mitigation Measure 2 and where the ECM is located on site, and a briefing on the CEMP as required by Mitigation Measure 1 • information on the protection measures to be implemented to protect vegetation, penalties for breaches and location of areas of sensitivity • preliminary identification of Aboriginal cultural heritage material. This training will 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. A heritage induction informing contractors of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction.	Contractor	Pre-construction

No.	Mitigation measure	Responsibility	Timing
4.	**Transport Environmental Management Approvals** Requirements for documents, plans or programs which must be reviewed and approved by the TESR (including the CEMP) are outlined in the Mitigation Measures. All reviews and approvals associated with these Mitigation Measures shall meet the following requirements (unless otherwise approved by the TESR or DES or if specifically noted in a Mitigation Measure): a) completed consultation with government agencies and relevant service/utility providers and evidence of consultation submitted with the plan b) a copy of the plan submitted to the TESR for review at least 21 days prior to commencement of Construction or the related works being commenced c) any comments made by the TESR in accordance with b) must be adequately addressed prior to submission for approval d) a copy of the plan submitted to the TESR to obtain written approval from the DES at least five days prior e) periodic review and update of the plan submitted to the TESR for written approval Construction must not commence until the DES has provided written approval of the plan/s.	Contractor	Pre-construction
5.	**Environment Personnel** Suitably qualified and experienced environmental management personnel shall be available and be responsible for implementing the environmental objectives for the Proposal, including undertaking regular site inspections, preparation and implementation of environmental documentation and ensuring the Proposal meets the requirements of the Environmental Management System (EMS). Details of the environmental personnel, including relevant experience, defined responsibilities and resource allocation throughout the Proposal (including time to be spent on-site/off-site) are to be submitted for the written approval of the DES, at least 21 days prior to commencement of construction of the Proposal (or such time as otherwise approved by the DES). Any adjustments to environmental resource allocations (on-site or off-site) are to be approved by the DES.	Contractor	Pre-construction and construction
6.	**Service Relocation** Service relocation will be undertaken in consultation with the relevant authority. Existing services and exclusion zones shall be identified on the ECM and on site to avoid direct impacts during construction.	Contractor	Pre-construction and construction

No.	Mitigation measure	Responsibility	Timing
7.	**Detailed Design Validation** A detailed design validation report (DDVR) for the Proposal shall be prepared and submitted at each design stage to detail how compliance is achieved against: • the final Proposal description • all design mitigation measures detailed in the REF • any conditions of approval in the determination report for the Proposal. A final DDVR will accompany the Approval for Construction (or equivalent) submission. The Proponent shall: a) submit a copy of the DDVR to the TESR for review b) update and submit a DDVR revision at each design stage or as required, including as the design progresses c) the TESR is to be given a minimum period of seven days to review and provide any comments to the Proponent in relation to the DDVR. Upon completion of the final TESR review period a copy of the DDVR will be submitted to the DES (or nominated delegate) for written approval. The DDVR will be submitted to Transport for review and Confirmation that the design achieves compliance.	Contractor	Pre-construction and following each design phase
8.	**Environmental Incident Procedure** Where non-compliances or incidents arise, an event report must be completed in the Transport incident management system and returned to the Principal's Representative in accordance with 'EMF-EM-PR-0001 Environmental Incident Procedure'.	Contractor	Construction
9.	**Proposal Modifications** Any modifications to the Proposal (as defined in this REF and/or future Determination Report), requiring an amendment REF (as determined by the TESR), will be subject to further assessment and approval by Transport. This assessment will need to demonstrate that any environmental impacts resulting from the modifications have been mitigated. The further assessment must be submitted and approved prior to commencement of works relating to the modification.	Contractor	As required
10.	**Proposal Changes** Any modifications to the Proposal (as defined in this REF and/or future Determination Report), which may be amended by a consistency assessment (as determined by the TESR), if approved, will be subject to further assessment and approval by Transport. This assessment will need to demonstrate that any environmental impacts resulting from the change have been minimised. The further assessment must be submitted to Transport six weeks prior to commencement of works relating to the modification.	Contractor	As required
11.	**Modification/Change Register** A project modification/change register shall be created and maintained throughout the project to identify project changes or modifications. The register will be updated and submitted at each design stage or as required, including as the design progresses. The register will be submitted to TESR for review of changes and direction on the approval pathway these changes or modifications should apply.	Contractor	As required

No.	Mitigation measure	Responsibility	Timing
12.	**Construction Environmental Compliance Report** A Construction Environmental Compliance Report (CECR) for the Proposal shall be prepared which addresses the following matters: a) compliance with the Construction Environmental Management Plan (CEMP) and these conditions b) compliance with any approvals or licences issued by relevant authorities for the construction of the Proposal c) implementation and effectiveness of environmental controls (the assessment of effectiveness should be based on a comparison of actual impacts against performance criteria identified in the CEMP) d) environmental monitoring results, presented as a results summary and analysis e) details of the percentage of waste diverted from landfill and the percentage of spoil beneficially reused f) number and details of any complaints, including summary of main areas of complaint, actions taken, responses given and intended strategies to reduce recurring complaints (subject to privacy protection) g) details of any review and amendments to the CEMP resulting from construction during the reporting period h) any other matter as requested by the DES. The CECR shall: i. be submitted to the TESR for review. Be submitted to the DES for written approval upon completion of the TESR review period. The first CECR shall be submitted to the TESR four weeks prior to construction commencing and will include a pre-construction environmental compliance matrix for the Proposal that details compliance with all relevant conditions and mitigation measures. The succeeding CECRs shall be submitted at six monthly intervals for the construction and be submitted within four weeks of expiry of that period (or at any other time interval approved by the DES). The final CECR shall detail compliance with all Conditions of Approval, licences and permits required to be obtained under any other legislation for the Proposal. Each revision of the CECR shall be submitted to the TESR for review and written approval in accordance with mitigation measure 4.	Contractor	Pre-construction and construction
Traffic and transport			
13.	**Road Condition Reports** Prior to construction commencement, road condition surveys and reports on the condition of roads and footpaths to be affected by construction shall be prepared and provided to Transport for information. Any damage resulting from the construction of the Proposal, aside from that resulting from normal wear and tear, shall be repaired at the Contractor's expense.	Contractor	Pre-construction and post-construction
14.	**Authorisation for Road Use** Relevant authorisation(s) from the appropriate road authority will be obtained for the proposed operational changes to Hartill-Law Avenue, such as the new pedestrian crossing and changes to parking and bus stops.	Contractor	Operation

No.	Mitigation measure	Responsibility	Timing
15.	The temporary full and partial road closures and traffic management controls on public roads on Hartill-Law Avenue will be managed and implemented in accordance with the provisions of Road Occupancy Licence(s).	Contractor	Pre-construction, construction
16.	The emergency services, public transport operators, and other key users will be notified in advance of all internal and external changes in the station. The public will be advised to allow additional travel time.	Contractor	Pre-construction, construction
17.	The pedestrian crossing will be considered further during detailed design in consultation with the road authority and in consideration of public feedback on the concept design.	Transport/ Contractor	Detailed design
18.	Consultation with Transport for NSW and Bayside Council will be conducted to investigate dedicated car parking areas, including potentially leasing off-street car parking areas for construction workers to minimise potential impacts on the on-street parking in the surrounding area.	Contractor	Pre-construction, construction
19.	The car park on Slade Road will be reinstated to pre-construction conditions after the site compound has been demobilised.	Contractor	Post-construction
Urban design, landscape and visual amenity			
20.	**Urban and Landscape Design Plan** An Urban Design and Landscape Plan (UDLP) will be prepared by the Contractor, in consultation with Council and other asset/land owners, and submitted to Transport for written approval by the Urban Design Public Transport and Precincts team, prior to finalisation of the detailed design. The UDLP shall: a) demonstrate a robust understanding of the precinct through a comprehensive site analysis, including connectivity with street networks, mode change locations, active transport, and pedestrian movement b) identify opportunities and constraints c) establish precinct specific principles to guide and test design options d) consider Crime Prevention Through Environmental Design (CPTED) principles, including night-time safety of customers and the community, and the safety of station staff. e) be aligned with the "TAP Urban Design Plan Guidelines (Draft 2018)" and "Around the Tracks - urban design for heavy and light rail (Dec 2016 Interim Issue)". f) consider opportunities for: o Connecting with Country o integrated heritage interpretation and adaptive reuse o public art o safety improvements g) specify opportunities for community feedback and engagement on design elements	Contractor	Prior to design finalisation

No.	Mitigation measure	Responsibility	Timing
	h) address Transport Sustainable Design Guideline evidence requirements i) be prepared by a suitably qualified and experienced urban design professional The UDLP is to include a Public Domain Plan for the preferred design option and will provide analysis of the: i. landscape design approach including design of pedestrian and bicycle pathways, street furniture, interchange facilities, new planting and integration of any artwork ii. Materials Schedule including materials and finishes for proposed built works, colour schemes, paving and lighting types for public domain, fencing and landscaping iii. an Artist's Impression or Photomontage to communicate the proposed changes to the precinct The following design guidelines are available to assist and inform the UDLP: • TAP Urban Design Plan, Guidelines, Transport NSW, Draft 2018 • Commuter Car Parks, Urban Design Guidelines, Transport for NSW, Interim 2017 • Managing Heritage Issues in Rail Projects Guidelines, Transport for NSW, Interim 2016 • Creativity Guidelines for Transport Systems, Transport for NSW, Interim 2016 • Water Sensitive Urban Design Guidelines (Transport for NSW June 2023) The UDLP is to be submitted to Transport and written approval by the Urban Design Public Transport and Precincts team.		
21.	**Transport's Design Review Panel** At 30% design stage, the design will be presented to Transport's Design Review Panel. Transport's Design Review Panel is an independent, multi-disciplinary panel of eminent experts who provide impartial design review and recommendations. This will contribute to achieving design excellence in respect to place making, built form, urban and landscape design and Connecting with County aspects of the project.	Contractor	Prior to design finalisation
22.	**Lighting Scheme** A lighting scheme for the construction and operation of the Proposal is to be developed by a suitably qualified lighting designer and prepared in accordance with relevant standards. The lighting scheme shall address the following as relevant, but not limited to: a) consideration of lighting demands of different areas b) consideration of outcomes of Safer Cities consultation (where applicable) c) strategic placement of lighting fixtures to maximise ground coverage d) use of LED lighting e) meet benchmark requirements of IS Essentials f) demonstrate that light spill and glare has been minimised to sensitive receivers by directing lighting into the station/car park.	Contractor	Prior to design finalisation

No.	Mitigation measure	Responsibility	Timing
	g) control systems for lighting that dim or switch-off lights settings according to the amount of daylight the zone is receiving h) motion sensors to control low traffic areas i) allowing the lighting system to use low light or switch off light settings while meeting relevant lighting Standards requirements, and j) ensuring security and warning lighting is not directed at neighbouring properties. The proposed lighting scheme is to be submitted to Transport's technical team for acceptance prior to design finalisation.		
23.	**Worksite Compounds and Hoardings** Worksite compounds will be screened for the construction with shade cloth that has Transport for NSW branding, unless approved otherwise by the Transport Community and Stakeholder Engagement Manager, to minimise visual impacts from key viewing locations. Temporary hoardings, barriers, traffic management and signage will be removed as soon as practicable and safety requirements allow. This material should comply with *The Infrastructure Project Style Guide November 2022* (Transport for NSW, 2022). Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding will take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.	Contractor	Construction
24.	**Graffiti and Advertising** Hoardings, site sheds, fencing, acoustic walls around the perimeter of the site, and any structures built as part of the Proposal shall be maintained free of graffiti, or any advertising not authorised by Transport, during the construction period. Graffiti and unauthorised advertising shall be removed or covered within the following timeframes unless otherwise approved by Transport: a) offensive graffiti will be removed or concealed within 24 hours b) highly visible (yet inoffensive) graffiti will be removed or concealed within a week c) graffiti that is neither offensive or highly visible will be removed or concealed within a month d) any unauthorised advertising material will be removed or concealed within 24 hours.	Contractor	Construction
25.	Public art and cultural interpretative elements should be incorporated during detailed design and could be incorporated in perforated screens and solid wall facades	Transport / Contractor	Detailed design
26.	Alternative traffic barriers along Hartill-Law Avenue overbridge that provide better pedestrian-scale (height and width) and improved streetscape amenity shall be investigated during detailed design.	Transport / Contractor	Detailed design
27.	Enhancement of landscape amenity through planting within the local centre shall be considered during detailed design.	Transport / Contractor	Detailed design

No.	Mitigation measure	Responsibility	Timing
Noise and vibration			
28.	**Construction Noise and Vibration** Prior to commencement of construction, a Construction Noise and Vibration Management Plan (CNVMP) will be prepared and implemented in accordance with the requirements of the EPA's *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), Transport's *EMF-NV-GD-0060 Construction noise and vibration guideline (public transport infrastructure)* (Transport for NSW, 2023a) and the Noise and Vibration Impact Assessment for the Proposal (SLR, 2024). The CNVMP shall include, but not be limited to: a) details of construction activities and an indicative schedule for construction b) identification of construction activities that have the potential to generate noise and/or vibration impacts on surrounding land uses, particularly sensitive noise receivers c) detail what reasonable and feasible actions and measures shall be implemented to minimise noise impacts (including those identified in the REF) d) procedures for notifying sensitive receivers of construction activities that are likely to affect their noise and vibration amenity, as well as procedures for dealing with and responding to noise and vibration complaints e) an Out of Hours Work Protocol (OOHWP) for the assessment, management and approval of works outside the standard construction hours identified in Mitigation Measure 30 of this approval, including a risk assessment process which deems the out of hours activities to be of low, medium or high environmental risk, is to be developed. All out of hours works are subject to written approval by the DES or as approved by EPA (where relevant to the issuing of an EPL). The OOHWP should be consistent with the Transport *Construction noise and vibration guideline (public transport infrastructure)* (Transport NSW, 2023a) f) a description of how the effectiveness of actions and measures shall be monitored during the proposed works, identification of the frequency of monitoring, the locations at which monitoring shall take place, recording and reporting of monitoring results and if any exceedance is detected, the manner in which any non-compliance shall be rectified g) how the Proposal addresses IS Essentials Env-2 Noise and Env-3 Vibration level 1 criteria The CNVMP shall consider and outline measures to reduce the noise and vibration impacts from construction activities. Where practicable at source measures including by construction planning/staging and equipment selection shall be prioritised over at receiver measures. Reasonable and feasible mitigation measures include: • regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising emissions and how to use equipment in ways to minimise noise and vibration • avoiding any unnecessary emissions when carrying out manual operations and when operating plant • ensuring spoil is placed and not dropped into awaiting trucks or other plant/vehicles • avoiding/limiting simultaneous operation of noisy or vibratory 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 will be switched off whilst being unloaded • avoiding deliveries at night/evenings or other sensitive times wherever practicable • no idling of delivery trucks	Contractor	Pre-construction

No.	Mitigation measure	Responsibility	Timing
	• ensuring truck drivers are informed of designated vehicle routes, parking locations and acceptable delivery hours for the site • minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios onsite; no dropping of materials from height where practicable, no throwing of metal items and slamming of doors • maximising the offset distance between noisy or vibratory plant and sensitive receivers and maintaining safe working distances for workers • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • use of quieter and less vibration emitting construction methods where feasible and reasonable • non-tonal movement alarms (or an equivalent mechanism) fitted and used on all construction vehicles and mobile plant regularly used on-site (i.e. greater than one day) and for any out of hours work.		
29.	**Property Condition Surveys** The purpose of a property condition survey is to provide a clear record for comparison in case landowners have concerns about damage to property which they feel may have been caused as a result of construction work. Subject to landowner agreement, property condition surveys shall be completed prior to the commencement of piling, excavation or bulk fill or any vibratory impact works including jack hammering and compaction (Designated Works). Surveys are to be offered to owners of: i. all buildings/structures/roads within a distance of 50 metres from the edge of the Designated Works (measured in a straight line) ii. all heritage listed buildings and other sensitive structures within 150 metres from the edge of the Designated Works. Surveys are to be undertaken prior to the commencement of the Designated Works and again immediately upon completion of the Designated Works. This includes a survey of the site compound location/s prior to the commencement of construction, and as soon as possible once the site compound has been demobilised. Owners of assets to be surveyed are to be contacted via letter at least 14 days prior to the intended commencement of property condition surveys. Letters of offer are to include the scope and methodology of the survey, and the process for making a claim regarding property damage should post-work property condition surveys confirm damage at the fault of the project. Property condition surveys need not be undertaken if a risk assessment indicates that selected buildings/structures/roads identified in (a) and (b) will not be affected as determined by a qualified geotechnical and construction engineering expert with appropriate registration on the National Professional Engineers Register prior to commencement of Designated Works and provided to Transport. Evidence of a risk assessment must be provided to Transport for agreement prior to commencement of Designated Works. A copy of the survey(s) shall be given to each affected owner and Transport. A register of all properties surveyed shall be maintained. Any damage to buildings, structures, lawns, trees, sheds, gardens, etc. as a result of construction activity direct and indirect (i.e. including vibration and groundwater changes) shall be rectified at no cost to the owner(s).	Contractor	Pre-construction, post-construction

No.	Mitigation measure	Responsibility	Timing
30.	**Standard Construction Hours** Construction activities shall be restricted to the hours of 7:00 am to 6:00 pm (Monday to Friday); 8:00 am to 1:00 pm (Saturday) and at no time on Sundays and public holidays except for the following works which are permitted outside these standard hours: a) any works which do not cause noise emissions to be more than 5dBA higher than the rating background level (RBL) at any nearby residential property and/or other noise sensitive receivers b) out of hours work identified and assessed in the REF or the approved OOHWP c) the delivery of plant, equipment and materials which is required outside these hours as requested by police or other authorities for safety reasons and with suitable notification to the community as approved by the DES d) Emergency Work to avoid the loss of lives, property and/or to prevent environmental harm e) any other work as approved by the DES and considered essential to the Proposal, or as approved by EPA (where an EPL is in effect).	Contractor	Construction
31.	**Special Audible Characteristics Activities** As per the *Construction noise and vibration guideline (public transport infrastructure)* (Transport for NSW, 2023a), construction activities with special audible characteristics will be limited to standard hours, and start no earlier than 8am unless otherwise approved by the DES in accordance with the CNVS. Rock breaking or hammering, jack hammering, pile driving, vibratory rolling, cutting of pavement, concrete or steel and any other activities which result in impulsive or tonal noise generation shall not be undertaken for more than three continuous hours, followed by a minimum one hour respite period, unless otherwise approved to by the DES, or as approved by EPA (where relevant to the issuing of an EPL). **Note**. *Special audible characteristics* refers to noise with characteristics that can cause annoyance and disturbance, containing noticeable factors such as tonality, low frequency noise, impulsive or intermittent noise events. These characteristics may not be considered noisy in a quantitative sense.	Contractor	Construction
32.	**Piling** Wherever practical, piling activities shall be completed using non-percussive piles. If percussive piles are proposed to be used, written approval of the DES shall be obtained prior to commencement of piling activities.	Contractor	Construction

No.	Mitigation measure	Responsibility	Timing
33.	**Vibration Criteria** To avoid structural impacts as a result of vibration or direct contact with structures, the proposed work will be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Impact Assessment (SLR, 2024). Where these distances cannot be met vibration trials and attended vibration monitoring of the trials will be undertaken in order to assess and mitigate vibration impacts. Vibration resulting from construction and received at any structure outside of the Proposal shall be limited to: a) for structural damage vibration –British Standard BS 7385-2:1993 *Evaluation and measurement for vibration in buildings Part 2* and/or German Standard DIN 4150:Part 3 – 1999: *Structural Vibration in Buildings: Effects on Structures* b) 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 6472-2:1992 *Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)*. The Proposal also must address IS Essentials Env-3 Vibration level 1 criteria. These limits apply unless otherwise approved by the DES through the CEMP	Contractor	Construction
34.	**Vibration Impacts to Heritage Structures** To effectively mitigate potential impacts of vibration on heritage structures within the station, activities that cause vibration will be managed in accordance with British Standard BS 7385-2:1993. If a heritage building or structure is found to be structurally unsound (following inspection) a more conservative cosmetic damage objective of 2.5 mm/s peak component particle velocity (from DIN 4150) will be considered. Real time vibration monitoring will be conducted at commencement of relevant work to confirm compliance with the adopted standard. If vibration levels approach the determined trigger level, then the construction activity would cease and the heritage structure would be assessed and alternative construction methodologies developed, where practicable, before construction.	Contractor	Construction
35.	Where noise intensive equipment is to be used near to sensitive receivers, it is recommended that the work is scheduled for daytime hours. Where this is not possible, then the work should be scheduled in accordance with the *Construction noise and vibration guideline (public transport infrastructure)* (Transport for NSW, 2023a) 5.1.2 OOHW hierarchy, and completed as early as possible in each work shift to minimise the potential for night-time impacts.	Contractor	Construction
36.	Where work is identified as being within the vibration minimum working distances and is considered likely to exceed cosmetic damage criteria: • different construction methods with lower source vibration levels should be investigated and implemented, where feasible • attended vibration measurements should be carried out at the start of work to determine actual vibration levels at nearby receivers (works would be ceased if the monitoring indicates exceedance of the cosmetic damage criteria).	Contractor	Construction
37.	Work that is likely to have a 'clearly audible' impact on Our Lady of Lourdes Catholic Primary School and the Earlwood Preschool should be scheduled on weekends where possible.	Contractor	Construction

No.	Mitigation measure	Responsibility	Timing
Heritage Management			
38.	**Design Response** New work will be designed with a consideration of the architectural style and heritage elements of the station or precinct. The proposed elements will be sympathetic to the original design and seek to emphasise key details whilst not overwhelming or detracting from the heritage significance of the place.	Contractor	Detailed design
39.	**Heritage Induction** As part of the site induction in accordance with Mitigation Measure 3, a heritage induction will be provided to workers prior to construction, informing them of the location of known heritage items and guidelines to follow if unexpected heritage items or deposits are located during construction. All construction staff will undergo an induction in the preliminary identification of Aboriginal cultural heritage material. This training will 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.	Contractor	Pre-construction
40.	**Unexpected Heritage Finds** If previously unidentified or unexpected Aboriginal objects or non-Aboriginal heritage/archaeological items are uncovered during construction, the procedures contained in Transport's *Unexpected Heritage Items Procedure* (Transport NSW, 2024c) will be followed, and work within the vicinity of the find would cease immediately. The TESR shall be immediately notified to co-ordinate a response, which may include direction to seek appropriate advice from a suitably qualified and experienced Heritage Advisor (in consultation with Heritage NSW). Works in the vicinity of the find shall not re-commence until written approval to recommence has been received from the DES. The event must be reported in Transport incident management system as a report only event in accordance with the Transport Environmental Incident Guideline. If human remains are found, work shall cease in the vicinity of the find, the site must be secured and the NSW Police and/or Heritage NSW notified. Where required, approvals for archaeological investigations, which may include an Aboriginal Heritage Impact Permit, will be obtained prior to work recommencing at the location. A discovery of suspected human remains greater than 100 years old is an archaeological case and is not subject to the requirements of NSW *Coroners Act 2009*.	Contractor	Construction
41.	**Heritage Management Plan** A Heritage Management Plan (including detailed drawings, documentation and specifications) and Work Method Statement will be prepared as part of the CEMP to address heritage impacts and required management procedures to minimise risks.	Contractor	Pre-construction

No.	Mitigation measure	Responsibility	Timing
42.	**Heritage Advisor** A suitably qualitied and experience Heritage Advisor who is independent of the design and construction team's personnel shall be engaged to the satisfaction of the DES. The Heritage Advisor shall provide ongoing heritage, design and conservation advice throughout detailed design and any subsequent relevant design modifications to ensure that the final design adheres to the recommendations of the heritage assessments provided in the EIA. The Heritage Advisor involvement and reporting shall include, but not be limited to: a) Attendance at design meetings and/or heritage meetings to provide iterative heritage advice to actively inform design development b) Targeted historical research to inform the iterative advice as required (to be documented as part of the below summary) c) Summary of the iterative heritage advice provided which should capture (as a minimum): • the optioneering process undertaken as part of the design development, including heritage pros & cons • discussion on why particular heritage sensitive solutions might be discounted • discussion of the relevant detailed design stage • recommendations for next steps to further mitigate heritage impacts • Provide input and review heritage construction methodologies A progress draft of the above is to be provided at each detailed design stage. A final copy of the summary report is to be provided to Transport no later than one week after final submission. The summary report is to also include: i. confirmation of the extent of involvement of the Heritage Advisor in the detailed design process at the completion of Approved for Construction (AFC) design stage ii. identification and assessment of any changes to, and/or additional to the scope of work from those identified in the EIA which would affect heritage significance iii. a description of the impacts, and recommended mitigation measures relating to any new or amended scope of work identified in (b) above including the requirement for additional heritage approvals for consultation.	Contractor	Detailed design
43.	**Heritage Interpretation Plan** If required by the recommendations of the SoHI (Artefact, 2024) heritage interpretation shall be planned and integrated into the detailed design of the Proposal. The heritage interpretation planning shall be prepared by the Heritage Advisor (and sub-consultants as required i.e. graphics) with reference to *Sydney Trains Heritage Interpretation Guidelines*. The heritage interpretation planning shall be captured in a Heritage Interpretation Plan (HIP) that is to be issued as a progress report at each stage of detailed design. The final HIP must include all details necessary to proceed to fabrication and installation. The HIP is to be submitted in accordance with mitigation measure 4.	Contractor	Detailed design

No.	Mitigation measure	Responsibility	Timing
44.	**Protection of heritage items listed on the TAHE Section 170 Conservation Register** Design and construction of the Proposal within the curtilage of the Section 170 listed 'Bardwell Park Railway station Group' must be undertaken in accordance with the recommendations made in the Statement of Heritage Impact (Artefact, 2024). In accordance with Section 170a of the Heritage Act, if the Proposal includes demolition of significant fabric, TAHE must provide notification of the work to Heritage NSW 14 days (or 40 days if the item is identified as being of State significance, but is not listed on the NSW State Heritage Register) prior to the commencement of the work	Contractor	Detailed design and construction
45.	**Illustrated Services Plan** The Contractor in collaboration with the Heritage Advisor must prepare and submit an illustrated services plan to detail all services routes in order to demonstrate compliance with the Heritage Technical Note: Installation of New Electrical and Data Services at Heritage Sites (2017). The illustrated services plan should include, but not be limited to; high voltage (HV), low voltage, communications, PA and CCTV. The illustrated services plan must be submitted and approved by the Transport Heritage Specialist prior to the commencement of permanent works.	Contractor	Pre-construction
46.	**Photographic Archival Recording** Archival recording of 'Bardwell Park Railway Station Group' shall be undertaken in accordance with the Heritage NSW guidelines prior to works commencing. The archival recording shall be reviewed and approval by the TESR prior to submission to Heritage NSW or other government body. Copies of the archival recording are to be provided to Bayside Council for future reference.	Contractor	Pre-construction
47.	**Protection from Damage** During construction, suitable measures will be put in place to ensure the retained heritage elements are protected from damage. Measures may include hoardings, use of spotters during the movement of equipment and other measures as necessary.	Contractor	Construction
48.	**Documentation of Changes** Copies of the 'as built' construction plans, photographs illustrating the completed work and the Archival Record will be lodged with the Transport Heritage team as a documentary record of changes to the station.	Contractor	Construction
49.	**Update to S170 Register** On completion of work, an update will be prepared for the TAHE Section 170 Heritage and Conservation Register, with required details.	Contractor	Completion
50.	Mitigation measures in the Bardwell Park Station Upgrade Statement of Heritage Impact (Artefact, 2024) will be implemented.	Contractor	Detailed design, pre-construction, construction, post-construction

No.	Mitigation measure	Responsibility	Timing
Socio-economic			
51.	**Local Goods and Services** Sustainability criteria for the Proposal will be established to encourage the Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.	Contractor	Pre-construction
52.	**Public Feedback** Feedback through the public display process will be used to facilitate opportunities for the community and stakeholders to have input into the Proposal, where practicable. Community and stakeholder feedback is welcomed throughout the project's design and construction stages, via the project website, email address or project Infoline.	Transport	Pre-construction
53.	**Website** Project information shall be made available to members of the public, either on dedicated pages on the Transport/Project website or details provided as to where/if hard copies of this information may be accessed. Project information to be provided includes: a) a copy of the documents referred to under Condition 1 of any future approval b) 24 hour contact telephone number for information and complaints. All documents uploaded to the website must be compliant with the Web Content Accessibility Guidelines Version 2.2.	Transport	Pre-construction
54.	**Community Liaison Management Plan** A Community Liaison Management Plan (CLMP) shall be prepared and implemented to engage with government agencies, relevant Councils, landowners, community members and other relevant stakeholders (such as Aboriginal stakeholders, local business chambers, utility and service providers, bus companies, Taxi Council and businesses). The CLMP shall comply with the obligations of these conditions and should include, but not necessarily be limited to: a) a comprehensive, project-specific analysis of stakeholders, issues and proposed strategies to manage issues through the duration of the Proposal b) details of the communication tools (traditional and digital) and activities that will be used to inform and engage with the community and stakeholders c) a program for the implementation of community liaison activities relating to key construction tasks and milestones with strategies for minimising impacts and informing the community d) policies and procedures for handling community complaints and enquiries, including the Contractor's nominated 24 hour contact for management of complaints and enquiries e) analysis of other major projects/influences in the area with the potential to result in cumulative impacts to the community and strategies for managing these. The CLMP shall be prepared to the satisfaction of the relevant Community and Place Director (or nominated delegate) prior to the commencement of construction, and is to be reviewed and revised six-monthly during the construction of the Proposal.	Contractor	Pre-construction and construction

No.	Mitigation measure	Responsibility	Timing
55.	**Community Notification and Liaison** The local community shall be advised of any activities related to the Proposal with the potential to impact upon them. Prior to any site activities commencing and throughout the Proposal duration, the community is to be notified of works to be undertaken, the estimated hours of construction and details of how further information can be obtained (i.e. contact telephone number/email, website, newsletters etc.) including the 24 hour Construction Response Line number. Construction-specific impacts including information on traffic changes, parking changes, access changes, detours, services disruptions, public transport changes, high noise generating work activities and work required outside the nominated working hours shall be advised to the local community at least seven days prior to such works being undertaken or other period as approved to by the relevant Community and Place Director. Notifications are to be distributed via letterbox and/or email as agreed with the impacted stakeholders.	Contractor	Pre-construction and construction
56.	**Complaints Management** A 24 hour construction response line number shall be established and maintained for the construction. Details of all complaints received during construction, including complaints received in person and via email, are to be recorded on a project-specific complaints register, which is sent to the Principal Contractor daily upon receipt of a complaint. A verbal response to phone enquiries to acknowledge receipt of the complaint, and to confirm what action is proposed to be undertaken to resolve the issue (where possible), is to be provided to the complainant within two hours during all times construction is being undertaken and within 24 hours during non-construction times (unless the complainant agrees otherwise). A verbal response to written complaints (email/letter) should be provided within 48 hours of receipt of the communication where telephone details are provided or known. A detailed written response is to be provided to the complainant within seven calendar days for verbal and/or written complaints. Information on all complaints received during the previous 24 hours shall be forwarded to the TESR and Community & Place each working day.	Contractor	Construction
Biodiversity			
57.	**Removal of Trees or Vegetation** A Tree and Hollow Replacement Plan is to be prepared in accordance with Transport's Tree and Hollow Replacement Guideline. Trees and vegetation nominated to be removed in the Ecological Impact/Arborist Assessment (Allied Tree Consultancy, 2024)) will be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Landowners consent will be obtained prior to vegetation removal, should TAHE not be the landowner. Trees and vegetation to be retained will be protected through temporary protection measures discussed in Mitigation Measures below. Separate approval, in accordance with Transport's EMF-EM-TT-0144 Removal or trimming of vegetation application, is required for the trimming, cutting, pruning or removal of all trees or vegetation where the impact has not already been identified in the REF or Determination Report for the Proposal. The trimming, cutting, pruning or removal of trees or vegetation shall be undertaken in accordance with the Mitigation Measures.	Contractor	Design and Construction

No.	Mitigation measure	Responsibility	Timing
58.	**Biodiversity Management** Construction of the Proposal must be undertaken in accordance with Transport's *Biodiversity Policy* (Transport for NSW 2022b), including the Transport's *Biodiversity Assessment Guideline* (Transport for NSW 2023), Transport's *No net loss guidelines* (Transport for NSW, 2023c) and Transport's *Tree and hollow replacement guidelines* (Transport for NSW, 2023d).	Contractor	Construction
59.	**Tree Protection Zones** Tree Protection Zones (TPZs) will be established around trees to be retained, as nominated in the Arborist Assessment (Allied Tree Consultancy, 2024) or as required to protect vegetation. Tree protection will be undertaken in accordance with *AS 4970-2009 Protection of Trees on Development Sites* and will include exclusion fencing of TPZs. The tree dripline may be used as a guide for protecting trees where an exclusion zone is not established by an arborist/ecologist. Should the approved development be altered by a post-approval assessment, consideration of any additional TPZs beyond those identified in the Arborist Assessment (Allied Tree Consultancy, 2024) will be required and may need to be supported by additional or addendum arboricultural advice.	Contractor	Construction
60.	**Tree and Vegetation Damage** In the event of any tree or vegetation to be retained becoming damaged during construction, the Contractor will immediately notify the Transport Project Manager and TESR to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible. Where arborist advice indicates that a tree or vegetation may be at risk of failure due to project works the priority should be to retain and protect the tree or vegetation. Following completion of construction the arborist should reassess the tree and their advice followed. Where tree or vegetation removal is required, replacement must be in accordance with the Transport's Biodiversity Policy (Transport for NSW 2022b).	Contractor	Construction
61.	**Weed Control** Weed control measures, consistent with Transport's *Biodiversity Policy* (Transport for NSW, 2022b) and the *Pesticides Regulation 2017*, will be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the Proposal. This will include the management and disposal of weeds in accordance with the *Biosecurity Act 2015*.	Contractor	Construction
62.	**Replanting Program** Any vegetation removal shall be offset in accordance with Transport's *Biodiversity Policy* (Transport for NSW 2022b). All vegetation planted on-site is to consist of locally native species, unless otherwise approved by the DES or as required by a Heritage Approval/Recommendation, following consultation with the relevant Council, where relevant, and/or the owner of the land upon which the vegetation is to be planted. A replanting strategy and maintenance schedule of offsetting on and offsite is to be provided to the TESR for review and approval at least four weeks prior to the commencement of replanting. All vegetation will be maintained for at least 12 months following completion of construction or following planting (whichever ends last) (unless approved by the TESR).	Contractor	Construction and operation

No.	Mitigation measure	Responsibility	Timing
63.	A Flora and Fauna Management Sub-plan (FFMSP) will be prepared as part of the CEMP in accordance with the *Biodiversity Management Guideline EMF-BD-GD-0039* (Transport, 2024a). It will include, but is not limited to: • Plans showing areas to be cleared and areas to be protected • Pre-clearing survey requirements • Unexpected finds protocol • Weed and pathogen management protocols Staff on site during pre-clearing surveys will need to be inducted so that there is an awareness for potential threatened species and their habitat and so that they can appropriately safeguard, manage and relocate any fauna if found during surveys	Contractor	Pre-construction Construction
64.	Pre-clearance surveys shall be undertaken by a suitably qualified ecologist at a minimum for microbats in accordance with *Guide 1: Preclearing process* in Transport's *Biodiversity Management Guideline EMF-BD-GD-0039* (Transport, 2024a). If fauna is encountered, this will be undertaken in accordance with *Guide 9: Fauna handling* in Transport's *Biodiversity Management Guideline EMF-BD-GD-0039* (Transport, 2024a).	Contractor	Pre-construction
65.	Should fauna be encountered, Transport's *Guide 9: Fauna handling* in *Transport's Biodiversity Management Guideline EMF-BD-GD-0039* (Transport, 2024a) shall be applied. In the event that threatened species are encountered, Transport's unexpected finds procedure will be followed in accordance with *Guide 1: Preclearing process* in Transport's *Biodiversity Management Guideline EMF-BD-GD-0039* (Transport, 2024a).	Contractor	Construction
Soils and water			
66.	**Storage and Use of Hazardous Materials** Construction hazard and risk issues associated with the use and storage of hazardous materials shall be addressed through risk management measures, which shall be developed prior to construction as part of the overall CEMP, in accordance with relevant EPA guidelines, Transport's *EMF-EM-GD-0137 Chemical storage and spill response guidelines* (Transport for NSW, 2023) and Australian and ISO standards. These measures shall include: a) the storage of hazardous materials, and refuelling/maintenance of construction plant and equipment are to be undertaken in clearly marked designated areas designed to contain spills and leaks b) spill kits, appropriate for the type and volume of hazardous materials stored or in use, to be readily available and accessible to construction workers. Kits are to be kept at hazardous materials storage locations, in site compounds and on specific construction vehicles. Where a spill to a watercourse is identified as a risk, spill kits are to be kept in close proximity to potential discharge points in support of preventative controls all hazardous materials spills and leaks to be reported to site managers and actions to be immediately taken to remedy spills and leaks c) training in the use of spill kits to be given to all personnel involved in the storage, distribution or use of hazardous materials.	Contractor	Pre-construction

No.	Mitigation measure	Responsibility	Timing
67.	**Erosion and Sediment Control** Soil and water management measures shall be prepared, implemented and maintained for the mitigation of water quality impacts during construction of the Proposal in accordance with *Managing Urban Stormwater: Soils and Construction Volume 14th Edition* (Landcom, 2004). The following are required, based on the amount of disturbance proposed: • soil and water management measures included on the ECM and in the CEMP for less than 250m^2 of disturbance • erosion and sediment control plan (ESCP) for between 250-2,500m^2 of disturbance • soil and water management plan (SWMP) for over 2,500m^2 of disturbance Management measures will be established prior to any clearing, grubbing or site establishment activities and will be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. At a minimum inspection will occur monthly and will be reported in the inspection report. Management measures will be maintained until the work is complete and areas are stabilised. The management measures shall be reviewed and updated throughout construction so they remain relevant to the activities being undertaken.	Contractor	Pre-construction and construction
68.	**Vehicle Maintenance** Vehicles and machinery will be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment will also be refuelled offsite, or in a designated refuelling area.	Contractor	Construction
69.	**Pollution Incident** In the event of a pollution incident, work will cease in the immediate vicinity and the Contractor will immediately notify the Transport Project Manager and TESR in accordance with the Transport Environmental Incident Procedure (EMF-EM-PR-0001. The EPA will be notified, in accordance with Part 5.7 of the POEO Act.	Contractor	Construction
70.	**Existing Drainage** The existing drainage systems will remain operational throughout the construction phase and will not be worsened or damaged by construction.	Contractor	Construction
71.	**Groundwater** Should groundwater be encountered during excavation work, groundwater will be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and Transport's *Water Discharge and Reuse Guideline* (Transport for NSW, 2019).	Contractor	Construction

No.	Mitigation measure	Responsibility	Timing
Air quality			
72.	**Minimising Impacts to Air Quality** To minimise air quality impacts and the generation of dust from construction activities, the following measures will be implemented: • plant and machinery will be switched off when not in use, and not left idling • vehicle and machinery movements during construction will be restricted to designated areas and sealed/compacted surfaces where practicable • 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 • details on how methods for management of emissions will be incorporated into project inductions, training and pre-start/toolbox talks • details for procedure to ensure plant and machinery are regularly checked and maintained in a proper and efficient condition • details for how the Proposal addresses IS Essential benchmark criteria These methods are to be identified in the CEMP.	Contractor	Pre-construction and construction
Waste and contamination			
73.	**Waste Management Plan** The CEMP (or separate Waste Management Plan, if necessary) must address waste management and will 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 • apply the waste hierarchy to resource output streams and justification provided • 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 • identify risk and opportunities associated with resources outputs and implement measures to minimise resource outputs during design, construction and operation • develop project performance targets for resource outputs for the delivery phase • identify opportunities to beneficially reuse resource outputs • develop a management plan for resource outputs and implement design phase actions.	Contractor	Pre-construction

No.	Mitigation measure	Responsibility	Timing
74.	**Hazardous Materials Survey** A Hazardous Materials Survey in accordance with AS 2601 (2001) *Demolition of Structures* shall be undertaken by an appropriately qualified environmental scientist prior to the demolition of the existing stairs and station building modifications. Subsequent removal of any hazardous material is to be undertaken in accordance with applicable EPA, SafeWork NSW and Safe Work Australia guidelines.	Contractor	Pre-construction
75.	**Contamination Investigation** Prior to construction, an investigation of the Proposal site shall be undertaken by a suitably qualified Environmental Consultant, in accordance with the level of assessment and requirements stipulated by the *National Environment Protection (Assessment of Site Contamination) Amendment Measure (NEPM) 2013.* The assessment shall also be generally undertaken in accordance with: a) Contaminated Sites - Sampling Design Guidelines (EPA, 2022) b) AS 4482 (2005) Guide to the investigation and sampling of sites with potentially contaminated soil. The investigation report shall be prepared in accordance with the *Guidelines for Consultants Reporting on Contaminated Sites* (Office of Environment and Heritage, 2011) and shall also include a preliminary waste classification in accordance with the *Waste Classification Guidelines* (EPA, 2014). Specific requirements for further investigation (including requirements for a Site Auditor), remediation or management of any contamination shall be included in the CEMP (or supporting Contamination Management Plan) as appropriate. Note: Nothing in this condition removes any obligation to adhere to the requirements under the NSW *Contaminated Land Management Act 1997* (or other legislation).	Contractor	Pre-construction
76.	**Unidentified Contamination (Other Than Asbestos)** If previously unidentified contamination (excluding asbestos) is discovered during construction, work in the affected area must cease immediately, and an investigation must be undertaken and report prepared to determine the nature, extent and degree of any contamination. The level of reporting must be appropriate for the identified contamination in accordance with relevant EPA guidelines, including the *Guidelines for Consultants Reporting on Contaminated Sites* (Office of Environment and Heritage, 2011). The event must be reported in Transport incident management system as a report only event in accordance with the Transport Environmental Incident Procedure. A copy of any contamination report shall be submitted to the TESR for review in accordance with Mitigation Measure 4. The DES shall determine whether consultation with the relevant Council and/or EPA is required prior to continuation of construction within the affected area.	Contractor	Construction

No.	Mitigation measure	Responsibility	Timing
77.	**Asbestos Management** If previously unidentified asbestos contamination is discovered during construction, work in the affected area must cease immediately, and an investigation must be undertaken and a report prepared to determine the nature, extent and degree of the asbestos contamination. The level of reporting must be appropriate for the identified contamination in accordance with relevant EPA, Safe Work Australia and SafeWork NSW guidelines and include the proposed methodology for the remediation of the asbestos contamination. Remediation activities must not take place until receipt of the investigation report. The event must be reported in Transport incident management system as a report only event in accordance with the Transport Environmental Incident Procedure. Works may only recommence upon receipt of a validation report from a suitably qualified contamination specialist that the remediation activities have been undertaken in accordance with the investigation report and remediation methodology. *Note: In circumstances where both previously unidentified asbestos contamination and other contamination are discovered within a common area, nothing in these conditions shall prevent the preparation of a single investigation report to satisfy the requirements of both Mitigation Measure 76 and Mitigation Measure 77.*	Contractor	Construction
78.	**Spoil Reuse, Removal and Classification** All excavated spoil suitable for reuse will be reused on site and distributed as approved by the TESR. The quantity and locations for reuse of excavated material would be further reviewed and confirmed with the TESR during construction. All spoil to be removed from site will be tested to confirm the presence of any contamination. Any contaminated spoil will be disposed of at an appropriately licensed facility. All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal.	Contractor	Construction
79.	**Concrete Washout** Any concrete washout will be established and maintained in accordance with Transport's *EMF-EM-GD-0145 Concrete washout guideline* –(Transport for NSW, 2023) with details included in the CEMP and location marked on the ECM.	Contractor	Construction

No.	Mitigation measure	Responsibility	Timing
80.	**Mulch and landscaping** 1. Mulch used in landscaping must, to the extent possible, be derived from trees, shrubs and any other vegetative material that is approved by the Principal for use as mulch, removed during the clearing and grubbing works on the Site. If the mulch produced in this way is insufficient or not available, make up the shortfall by using imported hardwood chip that complies with Australian Standard AS 4454, the EPA Mulch Order 2016 and Mulch Exemption 2016. Imported hardwood chip must also comply with the following requirements: a) hardwood chip must only be derived from waste hardwood timber. Woodchip derived from trees which have been specifically harvested for that purpose will not be accepted under any circumstances b) the material must comprise hardwood chips with not more than 5% fines by volume, and must not contain any bark c) the average size of the woodchip must be approximately 30 mm x 20 mm x 5 mm and the maximum length of chip must not exceed 50 mm d) hardwood chip must be free of soil, weeds, stones, vermin, insects or other foreign material. 2. Prior to procuring, the Contractor must provide in writing to the Principal the source of mulch, as well as a sample of mulch and product documentation demonstrating compliance, for approval or for other quality assurance diligence and surveillance purposes. 3. Prior to importing, the Contractor must ensure all imported mulch is visually inspected at the supplier's premises, with samples collected and tested in accordance with AS 4454. The Contractor must track batches of mulch to ensure the same mulch inspected and tested is delivered to site. 4. During unloading and land application, the Contractor must ensure that a suitably qualified expert visually inspects each load of mulch for compliance. All visual inspections of mulch must be documented and include as a minimum: a) location, date, and time of inspection b) name of inspector c) product name, supplier name, volume of material d) photographs of material inspected e) sample collection details (when applicable).	Contractor	Construction
Sustainability, climate change and greenhouse gases			
81.	**Sustainable Design Guidelines** Detailed design of the Proposal would be undertaken in accordance with the Transport *Sustainable Design Guidelines – Version 4.0* (Transport for NSW, 2017) and is to target a gold rating and achieve a minimum silver rating.	Contractor	During design
82.	**Carbon Footprint Exercise** The detailed design process will undertake a compliant carbon footprinting exercise in accordance with Transports *Carbon Tool* or other approved modelling tools. The carbon footprint will to be used to inform decision making in design and construction.	Contractor	During design

No.	Mitigation measure	Responsibility	Timing
83.	**Sustainability Officer** A suitably qualified and experienced Sustainability Officer shall be appointed who is responsible for implementing the sustainability objectives for the Proposal, in line with the Proposal's overarching Project Sustainability Plan. Details of the Sustainability Officer including defined responsibilities, duration and resource allocation throughout the appointment are to be submitted to the satisfaction of the Director of Sustainability prior to the preparation of the Sustainability Management Plan.	Contractor	Pre-construction
84.	**Sustainability Management Plan**– A Sustainability Management Plan (SMP) which details the approach to managing sustainability requirements and opportunities during design and construction shall be prepared. The SMP shall include the following as a minimum: a) a completed electronic checklist demonstrating compliance with the *Transport Sustainable Design Guidelines Version 4.0* (ST-114) b) a statement outlining the Construction Contactor's own corporate sustainability policies, obligations, goals, targets and commitments c) a description of the processes and methodologies for encouraging and identifying innovative sustainability outcomes on the Proposal, and the areas targeted for innovative sustainable solutions to be explored and/or implemented on the Proposal. d) the approach to the identification of opportunities to reduce carbon emissions, energy use and embodied lifecycle impacts of the Proposal. This should include a summary of initiatives proposed for implementation to meet energy and carbon management objectives and targets e) the approach to sustainable procurement including how procurement processes have taken in to account the principles of *ISO 20400: 2017 – Sustainable Procurement* in the selection of all materials, products and services f) a description of the processes, standards and procedures for undertaking climate change risk assessments and strategies for mitigation of risks associated with climate change and extreme weather events. A copy of the SMP shall be submitted to the Director of Sustainability at least 30 days prior to the commencement of construction, for written approval (or such time as is otherwise approved by the Director).	Contractor	Pre-construction
	Cumulative impacts		
85.	**Ongoing Cumulative Impacts** The potential cumulative impacts associated with the Proposal will be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures will be developed in the CEMP, and implemented as appropriate. The CLMP will capture how the known cumulative impacts would be managed with the community and key stakeholders.	Contractor	Pre-construction

7.3 Licensing and approvals

Table 7-2: Summary of licensing and approvals required

Instrument	Requirement	Timing
Roads Act 1993 (s.138)	Works requiring the closure of lanes on Hartill-Law Avenue would be carried out in line with a Road Occupancy Licence (ROL) to be obtained from the Traffic Management Centre	Pre-construction

8. Sustainability

8.1 Sustainability policy context

Consistent with the Future Transport Strategy, Transport is committed to managing impacts on the environment and operating in an environmentally sustainable manner. These commitments are set out in the Transport Environment and Sustainability Policy (2020) and Transport Net Zero and Climate Change Policy (2023b).

The Proposal has been developed and would be delivered in accordance with Transport's Policies and Transport's Sustainability Plan (Transport, 2021b).

8.2 Sustainability issues, opportunities and initiatives

The material sustainability issues and opportunities for the Proposal have been considered in the development of the sustainability objectives in Section 2.3.3, the sustainability initiatives and the consideration of a sustainability rating as described in Section 8.3.

Table 8-1 identifies how the Proposal has responded to the Transport Sustainability Plan (2021b) and sets out initiatives and recommendations for the Proposal. Sustainability objectives are outlined in Section 2.3.3.

Table 8-1 Sustainability objectives and initiatives of the Bardwell Park Station upgrade

Sustainability focus areas	Issue	Objectives	Initiatives (how is the project responding)
Respond to climate change	Climate resilience	Undertakes a climate risk assessment that mitigates all extreme and high residual risks. The Proposal is targeting mitigation of 50 per cent of medium risks. BSR also requires the Proposal to eliminate all 'very high' and 'high' climate risks identified in the Climate Risk Assessment by 100 per cent design stage, or as agreed with Transport.	The Proposal has undertaken a Detailed Climate Risk Assessment and Report during the concept design stage (refer to Section 6.11). The climate risk assessment identified no high and very high climate risks. There were three medium risks identified. Adaptations in the concept design towards two of these risks have been applied, reducing the risk rating from medium to low (refer to Section 6.11).
	Energy and carbon	Reduction of GHG emissions through materials choice, optimising design and construction practices onsite. Reduce construction related GHG emissions from the Proposal baseline GHG footprint established using the Transport Carbon Tool.	Key initiatives incorporated as part of the concept design: • Concrete materials replacement through Supplementary Cementitious Material (SCM) • Asphalt component materials replacement using maximum amount of Reclaimed Asphalt Pavement (RAP) in accordance with QA specification r116 • Replacing all asphalt with recycled asphalt • Transport Carbon Tool to be used to demonstrate the required emissions reduction from baseline measurements • Fossil fuel free construction would be investigated and viable opportunities implemented • Value engineering would look for opportunities to reduce material volumes.
		Buildings within the project are required to be designed and built to reduce energy consumption.	A key initiative incorporated as part of the concept design includes optimising lighting design including use of daylighting controls and use of energy efficient luminaires.

Sustainability focus areas	Issue	Objectives	Initiatives (how is the project responding)
Protect and enhance biodiversity	Biodiversity management	The Proposal is required to comply with the latest Transport for NSW guideline for calculating biodiversity offsets.	The Proposal currently complies with the latest *Transport for NSW Biodiversity Policy* (Transport 2022b) and the *Transport for NSW Tree and hollow replacement* guidelines (Transport 2023d) (refer to Section 6.7 for further information on biodiversity offsets).
Improve environmental outcomes	Pollution control	The Proposal is required to comply with the Australian Paint Approval Scheme (APAS) Volatile Organic Compound (VOC) limits for all fit for purpose surface coatings.	The Proposal currently complies with the required VOC limits and specifications.
		During construction, the Proposal would need to report on engine conformity with relevant emission standards and fitting of any exhaust after-treatment devices for all mobile non-road diesel plant and equipment used (with an engine greater than 19kW).	None
	Water cycle management	Monitor and report water consumption during construction and reduce potable water consumption, where practicable. The Proposal is targeting a minimum of 20 per cent of all construction water to be used during construction from non-potable sources.	None
		The Proposal is required to have all new water-using appliances, shower heads, taps and toilets to have at least the average Water Efficiency Labelling Scheme (WELS) star rating by product type.	All new water fixtures and appliances have been designed to comply with the compulsory requirements, achieving the Water Efficiency Labelling Scheme (WELS) ratings listed below (as a minimum): • toilets and urinals – 4 stars • taps and flow controllers – 4.5 stars.

Sustainability focus areas	Issue	Objectives	Initiatives (how is the project responding)
	Materials and waste	Reduce resource consumption and waste generation in the design and construction of the Proposal.	None
Partner with communities	Community benefits	The Proposal is required to meet steel and timber sustainable procurement requirements detailed in the SDG, as well as undertake sustainable procurement training for high impact suppliers.	None
		The Proposal is required to meet urban design principles in the *TfNSW Interim Urban Design Best Practice Guidelines* within their urban design and landscaping plan (UDLP) or equivalent.	The Proposal has developed an Urban Design and Landscape Plan (UDLP) and has undertaken an analysis as to how the Proposal meets the design principles (refer to Section 2.4 of this REF).
		The Proposal makes a contribution to industry and/or the local community in line with the project legacy categories specified in the SDG.	Key initiatives incorporated as part of the concept design: • installation of interpretive artwork. The artwork would promote community facilities and community identity related initiatives. This is achieved through the Connecting with Country principles (refer to Section 6.2 for more information) • installation of bicycle parking to coincide with future interchange demand • optimisation of local pedestrian links to and between community facilities and transportation modes • reuse of existing assets such as seating and light poles • improved physical, and perceptions of, safety particularly for women and girls.

8.3 Sustainability rating

The Proposal has applied during the concept design stage and would continue to apply the following Sustainability rating tools throughout the detailed design stage:

- Transport Sustainable Design Guidelines (V.4) (2017) – the Proposal is aiming to achieve a minimum Silver rating
- Baseline Specific Requirements (BSRs).

To deliver effective sustainability initiatives, the delivery Contractor would be responsible for ensuring requirements are embedded into the design, procurement, costing, construction, and maintenance and reported regularly to Transport.

Transport would ensure requirements are included in relevant contracts for the works and manage the ongoing inclusion and monitor outcomes of sustainability across the project lifecycle.

9. Conclusion

This chapter provides the justification for the Proposal taking into account its biophysical, social and economic impacts, the suitability of the site and whether or not the Proposal is in the public interest. The Proposal is also considered in the context of the objectives of the EP&A Act, including the principles of ecologically sustainable development as defined in section 193 of the Environmental Planning and Assessment Regulation 2021.

9.1 Justification

The Proposal is considered to be consistent with a number of strategies and plans, including:

- Future Transport Strategy (Transport, 2022a)
- NSW Disability Inclusion Action Plan (2021-2025) (NSW Government, 2020)
- A Metropolis of Three Cities - Greater Sydney Region Plan (Greater Sydney Commission, 2018a)
- South District Plan (Greater Sydney Commission, 2018b)
- Staying Ahead: State Infrastructure Strategy 2022-2042 (Infrastructure NSW, 2022)
- Future Bayside: A land-use vision to 2036 Bayside Council Local Strategic Planning Statement (Bayside Council, 2020)
- Bayside 2032: Community Strategic Plan 2018-2032 (Bayside Council, n.d.)
- Bayside Council Disability Inclusion Action Plan 2022-2026 (Bayside Council, n.d.).

The Proposal would meet the key strategic objectives within the above strategies and plans, as outlined in Section 2.1.

The Proposal forms part of the Safe Accessible Transport program. This program is designed to drive a stronger customer experience outcome, with improvements made to amenity, access and safety. The Proposal aims to deliver improved connectivity between modes including greater opportunities for active transport, encourage greater public transport use by providing safe and welcoming spaces, and better integration of interchanges within the communities they serve.

9.1.1 Social factors

Construction of the Proposal would result in minor social impacts through disruptions to pedestrian and traffic flow as a result of temporary partial road closures, temporary closure of the station building toilet, and minor noise, vibration, dust and visual impacts.

Over the long-term, the Proposal would provide social benefits to the Bardwell Park community and the wider public transport customer network through improved accessibility through the station and interchange facilities. Customer amenity and safety would also be improved as a result of the Proposal, through the provision of a new family accessible toilet, new unisex ambulant toilet, improved CCTV, improved signage and wayfinding, new platform canopies over the BAZs, a new accessible water refill station, upgrades to the station PA system and new lighting. The Proposal is anticipated to result in an overall improved experience for commuters using the station and the public transport network.

Improvements to customer accessibility, safety and amenity at Bardwell Park Station as a result of the Proposal are anticipated to result in an overall improved experience for commuters using the station and the Sydney Trains network.

9.1.2 Biophysical factors

The Proposal would result in the removal of two native trees. In accordance with Transport's *Tree and Hollow Replacement Guidelines* (Transport for NSW, 2023d), a total of eight replacement trees would be planted for the Proposal. This is anticipated to result in minimal impacts to the overall ecological values of the area with no substantial impacts expected to threatened flora or threatened ecological communities. Native and exotic fauna may incidentally use vegetation within the Proposal area, however the vegetation expected for removal does not constitute an important habitat for fauna species. The operation of the Proposal is not anticipated to result in significant impacts to biodiversity.

The construction of the Proposal is anticipated to result in minor air quality impacts as a result of dust produced from excavation work, and minor additional exhaust fumes from construction vehicles. The Proposal would not involve extensive excavation that would result in significant quantities of dust, with management measures anticipated to be sufficient to manage dust impacts from excavations. The operation of plant and equipment would result in increases in exhaust emissions, however these impacts are anticipated to be localised, short-term and minor. During operation, no additional air quality impacts are anticipated when compared to the existing situation.

9.1.3 Economic factors

The Proposal would result in improved access to Bardwell Park Station, which would improve access for all customers to the public transport network. This would allow for customers of all abilities improved access to goods and services throughout Greater Sydney. The construction of the lift from the platform to Hartill-Law Avenue and accessibility improvements at station interchange facilities also has the potential to increase patronage at local businesses in Bardwell Park.

Accessible transport improves the ability of people with disability to participate in their community and the economy. A safe, equitable and integrated transport network is important in enabling people across the state to travel safely and confidently to work, appointments, holidays, events, and to visit friends and family.

9.1.4 Public interest

The Proposal is in the public interest as it provides accessibility improvements to Bardwell Park Station, which would improve the ability for all customers to use the public transport network. The construction of the lift to the platform, platform regrading works, accessibility improvements at station interchange facilities and construction of the family accessible toilet and unisex ambulant toilet would all be in the public interest. In addition, safety and amenity improvements at Bardwell Park Station, including improved CCTV, improved signage and wayfinding, upgrades to the station PA system, and new bench and canopies at the BAZ, would provide benefits to all customers using Bardwell Park Station.

9.2 Objects of the EP&A Act

Table 9-1 Objects of the *Environmental Planning and Assessment Act 1979*

Instrument	Requirement
1.3(a) To promote the social and economic welfare of the community and a better environment by the proper management, development and conservation of the State's natural and other resources.	The Proposal would promote the social and economic welfare of the community through improved accessibility at Bardwell Park Station, improving the ability of all customers to access the station and the wider public transport network. The construction of the lift to the platform, platform regrading work, station interchange facility upgrades and station toilet upgrades would improve the usability of the station for customers of all abilities. In addition, upgrades to the station CCTV system, PA system, lighting, and signage and wayfinding would allow for improved management of the station and its customers.
1.3(b) To facilitate ecologically sustainable development by integrating relevant economic, environmental and social considerations in decision-making about environmental planning and assessment.	Ecologically sustainable development has been considered throughout the development of the Proposal, with the legislative context of ecologically sustainable development considered in Section 4 and the environmental, economic and social impacts of the Proposal considered in Section 6. Mitigation measures would be implemented to minimise construction impacts, including construction traffic, noise, heritage and biodiversity impacts. This includes the preparation of a CEMP to make sure safeguards and management measures are implemented and maintained during the construction period. Mitigation measures would also be implemented to minimise operational impacts, including visual impacts. Ecologically sustainable development is further discussed in Section 9.2.1
1.3(c) To promote the orderly and economic use and development of land.	The Proposal is required to provide accessibility and safety upgrades to Bardwell Park Station to improve the use of the station and surrounding public transport interchange facilities. This would allow for orderly and economic use of land particularly as it involves the upgrade of existing rail infrastructure.
1.3(d) To promote the delivery and maintenance of affordable housing.	Not relevant to the Proposal.
1.3(e) To protect the environment, including the conservation of threatened and other species of native animals and plants, ecological communities and their habitats.	The Proposal would require the removal of two trees, which is anticipated to result in minimal impacts to the overall ecological values of the area. An additional eight trees would be planted as replacement plantings in accordance with *Transport's Tree and Hollow Replacement Guidelines* (Transport, 2023d). Native and exotic fauna would likely incidentally use vegetation within the Proposal area, however the vegetation expected for removal does not constitute an important habitat for fauna species. The Proposal would not result in significant impacts to threatened species, ecological communities or their habitats.

Instrument	Requirement
1.3(f) To promote the sustainable management of built and cultural heritage (including Aboriginal cultural heritage).	The Proposal is not anticipated to impact Aboriginal cultural heritage. Despite this, Transport's Unexpected Heritage Items Procedure would be implemented if any previously unidentified or unexpected heritage items are discovered during construction. Upgrades to the station building would minimise impacts to heritage fabric as much as possible and would aim to integrate with the existing heritage design where possible.
1.3(g) To promote good design and amenity of the built environment.	The urban design and landscape concept for the Proposal has been developed to achieve an integrated outcome that helps fit the Proposal as sensitively as possible into its context and to minimise the impacts of the Proposal on the existing landscape character of the surrounding area. Mitigation measures would be implemented in the detailed design stage to ensure that the design objectives are realised.
1.3(h) To promote the proper construction and maintenance of buildings, including the protection of the health and safety of their occupants.	The Proposal involves upgrades to the station building, including a new family accessible toilet and unisex ambulant toilet and reconfiguration of the existing storage room to provide a new shared services equipment room. Reconfiguration of the station building would improve accessibility for all users, including through alignment of the toilet floor to the platform floor level, which would contribute to overall improved accessibility of Bardwell Park Station and improved health and safety outcomes for staff and customers using the station.
1.3(i) To promote the sharing of the responsibility for environmental planning and assessment between the different levels of government in the State.	Transport are responsible as the determining authority for this Proposal under Division 5.1 of the EP&A Act.
1.3(j) To provide increased opportunity for community participation in environmental planning and assessment.	Consultation with the community and relevant government agencies has been carried out during the development of the Proposal. Details on this consultation can be found in Chapter 5. There would be further opportunities for the public to comment on the Proposal during the public display of the REF.

9.2.1 Ecologically sustainable development

Ecologically sustainable development (ESD) is development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends. The principles of ESD have been an integral consideration throughout the development of the project.

ESD requires the effective integration of economic and environmental considerations in decision-making processes. The four main principles supporting the achievement of ESD as per the EPA Act are discussed below. Further information on consideration of sustainability issues, opportunities and initiatives is provided in Section 3.2.4 and Chapter 8.

The precautionary principle

The precautionary principle deals with reconciling scientific uncertainty about environmental impacts with certainty in decision-making. It provides that where there is a threat of serious or irreversible environmental damage, the absence of full scientific certainty should not be used as a reason to postpone measures to prevent environmental degradation.

This principle was considered during route options development (refer to Chapter 2). The precautionary principle has guided the assessment of environmental impacts for this REF and the development of mitigation measures.

A number of safeguards have been proposed to minimise potential impacts and to respond to areas of scientific uncertainty. These safeguards would be implemented prior to and during construction of the Proposal, as well as during operation. No safeguards have been postponed as a result of a lack of scientific uncertainty. A CEMP would be prepared prior to the commencement of construction, which would make sure the Proposal achieves a high-level of environmental performance.

Intergenerational equity

Social equity is concerned with the distribution of economic, social and environmental costs and benefits. Inter-generational equity introduces a temporal element with a focus on minimising the distribution of costs to future generations.

The Proposal would not result in any impacts that are likely to adversely impact the health, diversity or productivity of the environment for future generations. The Proposal would improve accessibility and safety at Bardwell Park Station for current and future generations, which would allow for all customers to access the public transport network from Bardwell Park Station more easily.

Should the Proposal not proceed, the principle of intergenerational equity may be compromised, as future generations would not benefit from improved accessibility and safety at Bardwell Park Station, meaning customers with accessibility needs would be limited in their ability to access goods and services via the public transport network.

Conservation of biological diversity and ecological integrity

The Proposal would result in minimal impacts to biological diversity and ecological integrity. Two trees would be removed as part of the Proposal. The removal of these trees would be offset through the planting of eight new trees at a suitably nearby location. The Proposal is not anticipated to result in significant impacts to threatened species or threatened ecological communities.

Improved valuation, pricing and incentive mechanisms

The principle of internalising environmental costs into decision making requires consideration of all environmental resources that may be affected by the carrying out of a project, including air, water, land and living things.

Environmental issues were considered as key matters in the initial design process and in the economic and financial feasibility assessments for the Proposal. The value placed on environmental resources is demonstrated in the extent of the planning and environmental investigations outlined in Chapter 0, and in the design of the mitigation measures described in Section 7.2. Implementation of these mitigation measures would result in an economic cost to Transport, which would be included in both the capital and operating cost of the Proposal.

In addition, the value of the Proposal to the community in terms of improved safety and accessibility has been recognised during development of the Proposal as the Proposal would improve accessibility for all users of Bardwell Park Station.

9.3 Conclusion

The proposed safety and accessibility upgrades at Bardwell Park Station is subject to assessment under Division 5.1 of the EP&A Act. The REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

This has included consideration (where relevant) of conservation agreements and plans of management under the NPW Act, biodiversity stewardship sites under the BC Act, wilderness areas, areas of outstanding value, impacts on threatened species and ecological communities and their habitats, and other protected fauna and native plants. It has also considered potential impacts to matters of national environmental significance listed under the EPBC Act.

A number of potential environmental impacts from the Proposal have been avoided or reduced during the concept design development and options assessment. The Proposal, as described in the REF, best meets the project objectives but would still result in some impacts on traffic and transport, landscape character and visual amenity, noise and vibration, socio-economic factors and biodiversity. These impacts would largely be temporary adverse impacts limited to the construction phase of the Proposal. Mitigation measures as detailed in this REF would ameliorate or minimise these expected impacts. The Proposal would also improve accessibility and safety at Bardwell Park Station, including in the station forecourt, and allow all customers to more easily access the wider public transport network from the station. On balance, the Proposal is considered justified and the following conclusions are made.

9.3.1 Significance of impact under NSW legislation

The Proposal would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared nor approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Biodiversity Development Assessment Report or Species Impact Statement is not required. The Proposal is subject to assessment under Division 5.1 of the EP&A Act. Consent from Council is not required.

9.3.2 Significance of impact under Australian legislation

The Proposal is not likely to have a significant impact on matters of national environmental significance nor the environment of Commonwealth land within the meaning of the *Environment Protection and Biodiversity Conservation Act 1999 (*Commonwealth). A referral to the Australian Department of Climate Change, Energy, the Environment and Water is not required.

10. Certification

I certify that I have reviewed and endorsed the contents of this REF and, to the best of my knowledge, it is in accordance with the EP&A Act, the EP&A Regulation and the Guidelines approved under Section 170 of the EP&A Regulation, and the information is neither false nor misleading. I accept it on behalf of Transport for NSW.

Name:	Zoe McLaughlin
Position:	Manager, Environment and Planning
Company name:	Aurecon Australasia Pty Ltd
Date:	27/08/2024

I have reviewed and accept the contents of this REF and that it is a true account of the Proposal.

Name:	Jaafar Reslan
Position:	Project Manager
Transport region/program:	Transport for NSW
Date:	27/08/2024

11. EP&A Regulation publication requirement

Table 11-1 EP&A Regulation publication requirement

Requirement	Yes/No
Does this REF need to be published under section 171(4) of the EP&A Regulation?	Yes

12. References

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Terms and acronyms used in this REF

Term / Acronym	Description
ABS	Australian Bureau of Statistics
AEP	Annual Exceedance Probability
AHIMS	Aboriginal Heritage Information Management System
BC Act	*Biodiversity Conservation Act 2016 (NSW)*
BSRs	Baseline sustainability requirements
CCTV	Closed Circuit Television
CECR	Construction Environmental Compliance Report
CEMP	Construction environmental management plan
CLMP	Community Liaison Management Plan
Commonwealth DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
CNVG	Construction Noise and Vibration Guideline (Public Transport Infrastructure)
CNVMP	Construction Noise and Vibration Management Plan
DBH	Diameter at Breast Height
DBYD	Dial Before You Dig
DDA	*Disability Discrimination Act 1992 (Cwlth)*
DPE	Former NSW Department of Planning and Environment, now split into DPHI and NSW DCCEEW
DPHI	Department of Planning, Housing and Infrastructure
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
ECM	Environmental controls map
EIA	Environmental impact assessment
EMS	Environmental Management System
EPA	NSW Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979 (NSW).* Provides the legislative framework for land use planning and development assessment in NSW
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth).* Provides for the protection of the environment, especially matters of national environmental significance, and provides a national assessment and approvals process
EPL	Environment Protection Licence
ESCP	Erosion and sediment control plan
ESD	Ecologically sustainable development. Development which 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
FFMSP	Flora and Fauna Management Sub-plan
FM Act	*Fisheries Management Act 1994 (NSW)*
GHG	Greenhouse gas
Heritage Act	*Heritage Act 1977 (NSW)*
HIP	Heritage Interpretation Plan
HV	High Voltage
HVI	Heat vulnerability index
LCA	Life cycle analysis
LCVIA	Landscape Character and Visual Impact Assessment

Term / Acronym	Description
LCZ	Landscape Character Zone
LEP	Local Environmental Plan. A type of planning instrument made under Part 3 of the EP&A Act.
LGA	Local Government Area
NCA	Noise Catchment Area
NML	Noise Management Level
NPW Act	*National Parks and Wildlife Act 1974 (NSW)*
NSW DCCEEW	New South Wales Department of Climate Change, Energy, the Environment and Water
OOHW	Out of hours work
OOHWP	Out of hours work protocol
PA system	Public Address system
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigations
PCT	Plant Community Type
PMST	Protected Matters Search Tool
POEO Act	*Protection of the Environment Operations Act 1997*
Proposal	The Bardwell Park Station Upgrade, as described in Chapter 3.
PSI	Preliminary Site Investigation
RBL	Rating background level (background noise levels)
Roads Act	*Roads Act 1993*
RMS	Former NSW Roads and Maritime Services, now Transport for NSW
ROL	Road Occupancy Licence
RSL	Returned and Services League of Australia
SDG	Sustainability Design Guideline
SEED	Sharing and Enabling Environmental Data
SEPP	State Environmental Planning Policy. A type of planning instrument made under Part 3 of the EP&A Act.
SEPP (Biodiversity and Conservation)	State Environmental Planning Policy (Biodiversity and Conservation) 2021
SEPP (Resilience and Hazards)	State Environmental Planning Policy (Resilience and Hazards) 2021
SEPP (Transport and Infrastructure)	State Environmental Planning Policy (Transport and Infrastructure) 2021
SMP	Sustainability Management Plan
SoHI	Statement of Heritage Impact
Station	Bardwell Park Station
SWMP	Soil and Water Management Plan
TAP	Transport Access Program
TAHE	Transport Asset Holding Entity
$tCO_{2\text{-}e}$	Tonnes of carbon dioxide equivalence
TEC	Threatened ecological community
TESR	Transport Environment and Sustainability Representative
TGSI	Tactile Ground Surface Indicators
TMP	Traffic Management Plan
Transport	Transport for NSW
UDLP	Urban Design and Landscape Plan
ULX	Underline crossing

Term / Acronym	Description
UNSDGs	United Nations Sustainable Development Goals
WARR Act	*Waste Avoidance and Recovery Act 2001*
WoNS	Weeds of National Significance

Appendix A - Consideration of section 171(2) factors and matters of national environmental significance and Commonwealth land

Consideration of section 171(2) factors

In addition to the requirements of the Guideline for Division 5.1 assessments (DPE 2022) as detailed in the REF, the following factors, listed in section 171(2) of the Environmental Planning and Assessment Regulation 2021, have also been considered to assess the likely impacts of the Proposal on the natural and built environment.

Factor	Description of impact	Duration and extent
a) Environmental impact on the community.	During construction, there would be some temporary impacts to the community, particularly in relation to noise, traffic, station access and visual amenity. During operation, the Proposal would result in benefits associated with accessibility improvements at Bardwell Park Station with minimal adverse operational impacts. Mitigation measures outlined in Section 7.2 would be implemented to manage and minimise adverse impacts.	Short-term adverse (minor) (construction) Long-term positive impacts (operation)
b) The transformation of the locality.	The Proposal would include the introduction of new visible elements to the station precinct including a new elevated walkway, lift shaft, new canopies along the platform as well as upgrades to the interchange facilities. These new elements would have a visual impact, however they would be consistent with the features of a railway facility and would not lead to a major transformation of the locality. Design criteria has informed the Proposal's design to minimise any transformation of the wider locality. Opportunities to include public art or Connecting with Country principles would be explored as the design progresses to integrate the Proposal within the wider locality. In addition, the temporary site compound would be demobilised and reinstated to similar pre-construction conditions in consultation with council and therefore would not result in the transformation of locality. Mitigation measures outlined in Section 6.2 and Section 7.2 would be implemented to manage and minimise adverse impact.	Long-term, minor adverse impacts (operation)
c) Any environmental impact on the ecosystems of the locality.	During construction, two medium native trees are proposed to be removed. The removal of these trees is considered to have an insignificant impact on the overall ecological values of the area as they would not result in the loss of naturally occurring PCT. Vegetation removal at this location can be categorised as urban native/exotic. In addition, the root mass and growth of these trees are currently restricted by adjacent structures and the large retaining wall. During operation, a minimum of eight replacement trees would be planted in a suitable location near the Proposal area.	Short-term adverse (minor) (construction) Long-term positive impacts (operation)

Factor	Description of impact	Duration and extent
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality.	During construction, temporary work areas surrounded by hoarding would be present on the platform, work occurring on Hartill-Law Avenue for interchange changes as well as a temporary site compound located on Slade Road. This would result in the temporary, short-term reduction of the aesthetic of locality as a result of the visual impact of the Proposal (see Section 6.2.3). During operation, the Proposal would include the introduction of new visible elements to the station precinct (see Section 3.1which would have a visual impact but would not result in a major impact on the landscape character of the locality.	Short-term adverse (moderate) (construction) Long-term, minor adverse impacts (operation)
e) Any effect on any locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations.	During operation, the Proposal would have a long-term, positive contribution to the area as it would provide equitable access to the station platform and station interchange facilities. This would improve the amenity of the station for all customers. The station is listed on the TAHE Section 170 Heritage and Conservation Register (#4801896) and is noted as having local heritage significance as a major public work completed as an unemployment relief project during the Great Depression, and as a major transport hub for Bardwell Park since 1931. The Proposal would result in impacts to heritage features such as the station building and platform as well as the overbridge, however the Proposal is considered necessary to improve access to Bardwell Park and the wider railway network for all customers.	Long-term, moderate adverse (operation)
f) Any impact on the habitat of protected fauna (within the meaning of the *Biodiversity and Conservation Act 2016*).	The Proposal would not have any impact on habitat or critical habitat of protected fauna.	Nil
g) Any endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air.	The Proposal is unlikely to have any impact on endangering any species of animal, plant or other form of like, whether living on land, in water or in the air.	Nil

Factor	Description of impact	Duration and extent
h) Any long-term effects on the environment	During operation, the Proposal would not have any long-term negative impacts on the environmental, including ecological, social and economic. The Proposal is anticipated to benefit the community, particularly members of the community that have mobility issues, with the upgrades to the station platform facilities, upgrade to the Bardwell Park station entry as well as changes to the station interchange facilities.	Long-term positive (moderate) (operation)
i) Any degradation of the quality of the environment.	The Proposal is unlikely to have any degradation of the quality of the environment subject to the implementation of the mitigation measures.	Nil
j) Any risk to the safety of the environment.	During construction, there is the potential for the Proposal to expose contaminants which could present a health risk to construction workers and station customers if not adequately managed. This may also pose an environmental risk as contaminants have the potential to enter nearby waterways via the stormwater network if not managed properly. Work also has the potential to expose hazardous substances such as asbestos or lead paint potentially present in the station building. The site compound would include storage of materials, plant and equipment and hazardous materials. These activities have the potential to contaminate soil from accidental spills and leaks (refer to Section 6.8 for details on contamination, landform, geology and soils). During construction, the potential impacts of climate change are expected to be minimal due to the short-term nature of the Proposal. As a result, a Climate Risk Assessment for the Proposal was not considered warranted. During operation, the Climate Risk Assessment identified three medium risks, including risks to public health as a result of heatwaves and extreme rainfall (refer to Section 6.11 for details on climate resilience). With the application of mitigation measures, the Proposal is unlikely to cause any pollution or safety of the environment (refer to Section 7.2 for proposed mitigation measures)	Short-term adverse (minor) (construction) Long-term positive (moderate) (operation)
k) Any reduction in the range of beneficial uses of the environment.	The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.	Nil

Factor	Description of impact	Duration and extent
l) Any pollution of the environment.	During construction, the Proposal would result in some noise, vibration, greenhouse gas and dust emissions during the construction phase. These would be minimised through the implementation of measures included in Section 7.2.	Short-term temporary adverse impacts (minor) (construction)
m) Any environmental problems associated with the disposal of waste	Subject to the implementation of the mitigation measures, the Proposal is unlikely to cause any environmental problems associated with the disposal of waste during construction. All waste would be managed and disposed of with a site-specific Waste Management Plan prepared as part of the Construction Environmental Management Plan.	Short-term, temporary adverse (minor) (construction)
n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply.	The Proposal is unlikely to increase demands on resources that are, or are likely to become, in short supply.	Nil
o) The cumulative environmental effect with other existing or likely future activities.	No projects were found through searches within the Bardwell Park suburb. There is no potential for cumulative impacts alongside the Proposal (refer to Section 6.13 for more information on cumulative impacts) The Traffic, Transport and Access Impact Assessment (Aurecon, 2024a) completed for the Proposal identified a future project outside Bardwell Park and Earlwood. Canterbury-Bankstown Bulldogs Centre of Excellence (SSD-69627466) is about three kilometres northwest of the Proposal. It is currently in the Prepare EIS phase. Negligible cumulative impacts are anticipated given consideration of its timing and location.	Nil
p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions.	The Proposal would not affect or be affected by any coastal processes or hazards.	Nil

Factor	Description of impact	Duration and extent
a) Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1	The Proposal would align with: • Future Transport Strategy • NSW Disability Inclusion Action Plan (2021-2025) • A Metropolis of Three Cities - Greater Sydney Region Plan • South District Plan • Staying Ahead: State Infrastructure Strategy 2022-2042 • Future Bayside: A land-use vision to 2036 Bayside Council Local Strategic Planning Statement • Bayside 2032: Community Strategic Plan 2018-2032 • Bayside Council Disability Inclusion Action Plan 2022-2026 See Chapter 2 of this REF for further information on the local context of the area and Chapter 4 for further information on statutory and planning framework.	Nil
b) Other relevant environmental factors	In considering the potential impacts of this Proposal all relevant environmental factors have been considered, refer to Chapter 0 of this assessment.	Nil

Matters of National Environmental Significance and Commonwealth land

Under the environmental assessment provisions of the EPBC Act, the following matters of national environmental significance and impacts on Commonwealth land are required to be considered to assist in determining whether the Proposal should be referred to the Australian Department of Climate Change, Energy, the Environment and Water.

Factor	Impact
a Any impact on a World Heritage property? There are no World Heritage properties in the vicinity of the Proposal	Nil
b Any impact on a National Heritage place? There are no National Heritage places in the vicinity of the Proposal	Nil
c Any impact on a wetland of international importance? There are no wetlands of international importance in the vicinity of the Proposal	Nil
d Any impact on a listed threatened species or communities?	Nil

Factor	Impact
The Proposal is not likely to significantly impact threatened species or ecological communities or their habitats, within the meaning of EPBC Act.	
e Any impacts on listed migratory species? The Proposal is not likely to significantly impact migratory species, within the meaning of the EPBC Act	Nil
f Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the vicinity of the Proposal	Nil
g Does the Proposal involve a nuclear action (including uranium mining)? The Proposal would not involve a nuclear action	Nil
h Additionally, any impact (direct or indirect) on the environment of Commonwealth land? The Proposal would not be undertaken on or near any Commonwealth land.	Nil

Appendix B - Statutory consultation checklists

SEPP (Transport and Infrastructure)

Certain development types

Development type	Description	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Car Park	Does the project include a car park intended for the use by commuters using regular bus services?	No	Bayside Council and the occupiers of adjoining land	Section 2.110
Bus Depots	Does the project propose a bus depot?	No	Bayside Council and the occupiers of adjoining land	Section 2.110

Development within the Coastal Zone

Development type	Description	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Development with impacts on certain land within the coastal zone	Is the Proposal within a coastal vulnerability area and is inconsistent with a certified coastal management program applying to that land?	No	Bayside Council	Section 2.14

Council related infrastructure or services

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Stormwater	Are the works likely to have a *substantial* impact on the stormwater management services which are provided by council?	No	Bayside Council	Section 2.10
Traffic	Are the works likely to generate traffic to an extent that will *strain* the capacity of the existing road system in a local government area?	No	Bayside Council	Section 2.10
Sewerage system	Will the works involve connection to a council owned sewerage system? If so, will this connection have a *substantial* impact on the capacity of any part of the system?	No	Bayside Council	Section 2.10

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Water usage	Will the works involve connection to a council owned water supply system? If so, will this require the use of a *substantial* volume of water?	No	Bayside Council	Section 2.10
Temporary structures	Will the works involve the installation of a temporary structure on, or the enclosing of, a public place which is under local council management or control? If so, will this cause more than a *minor* or *inconsequential* disruption to pedestrian or vehicular flow?	Yes	Bayside Council	Section 2.10
Road & footpath excavation	Will the works involve more than *minor* or inconsequential excavation of a road or adjacent footpath for which council is the roads authority and responsible for maintenance?	Yes	Bayside Council	Section 2.10

Local heritage items

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Local heritage	Is there is a local heritage item (that is not also a State heritage item) or a heritage conservation area in the study area for the works? If yes, does a heritage assessment indicate that the potential impacts to the heritage significance of the item/area are more than minor or inconsequential?	No	Bayside Council	Section 2.11

Flood liable land

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Flood liable land	Are the works located on flood liable land? If so, will the works change flood patterns to more than a *minor* extent?	Yes	Bayside Council	Section 2.12
Flood liable land	Are the works located on flood liable land? (to any extent). If so, do the works comprise more than minor alterations or additions to, or the demolition of, a building, emergency works or routine maintenance?	Yes	State Emergency Services Email: rra@ses.nsw.gov.au	Section 2.13

Public authorities other than councils

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
National parks and reserves	Are the works adjacent to a national park or nature reserve, or other area reserved under the *National Parks and Wildlife Act 1974*, or on land acquired under that Act?	No	Environment and Heritage Group, NSW DCCEEW	Section 2.15(2)(a)
National parks and reserves	Are the works on land in Zone E1 National Parks and Nature Reserves or in a land use zone equivalent to that zone?	No	Environment and Heritage Group, NSW DCCEEW	Section 2.15(2)(b)
Navigable waters	Do the works include a fixed or floating structure in or over navigable waters?	No	Transport for NSW - Maritime	Section 2.15(2)(c)
Artificial light	Would the works increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map? (Note: the dark sky region is within 200 kilometres of the Siding Spring Observatory)	No	Director of the Siding Spring Observatory	Section 2.15(2)(d)
Defence communications buffer land	Are the works on buffer land around the defence communications facility near Morundah? (Note: refer to Defence Communications Facility Buffer Map referred to in section 5.15 of Lockhart LEP 2012, Narrandera LEP 2013 and Urana LEP 2011.	No	Secretary of the Commonwealth Department of Defence	Section 2.15(2)(e)

Development type	Potential impact	Yes / No	If 'yes' consult with	SEPP (Transport and Infrastructure) Section
Mine subsidence land	Are the works on land in a mine subsidence district within the meaning of the *Mine Subsidence Compensation Act 1961*?	No	Mine Subsidence Board	Section 2.15(2)(f)
Willandra Lakes region world heritage property	Is the development on, or reasonably likely to have an impact on, a part of the Willandra Lakes Region World Heritage Property?	No	The World Heritage Advisory Committee and Heritage NSW	Section 2.15(2)(g)
Western Parkland City land	Is the development within a Western City operational area specified in Schedule 2 of the *Western Parkland City Authority Act 2018*, with a capital investment value of $30 million or more?	No	The Western Parkland City Authority constituted under that Act. Email: planningreferral@wpca.sydney Note: It is recommended to confirm email address with WPCA prior to consultation.	Section 2.15(2)(h)

Appendix C – EPBC Act PMST Search Results

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 18-Jun-2024

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	1
National Heritage Places:	5
Wetlands of International Importance (Ramsar	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	15
Listed Threatened Species:	121
Listed Migratory Species:	80

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	264
Commonwealth Heritage Places:	18
Listed Marine Species:	106
Whales and Other Cetaceans:	10
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	6
Regional Forest Agreements:	None
Nationally Important Wetlands:	4
EPBC Act Referrals:	65
Key Ecological Features (Marine):	None
Biologically Important Areas:	2
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

World Heritage Properties			[Resource Information]
Name	State	Legal Status	Buffer Status
Australian Convict Sites (Cockatoo Island Convict Site)	NSW	Declared property	In buffer area only

National Heritage Places			[Resource Information]
Name	State	Legal Status	Buffer Status
Historic			
Centennial Park	NSW	Listed place	In buffer area only
Cockatoo Island	NSW	Listed place	In buffer area only
Governors' Domain and Civic Precinct	NSW	Listed place	In buffer area only
Kamay Botany Bay: botanical collection sites	NSW	Listed place	In buffer area only
Indigenous			
Cyprus Hellene Club - Australian Hall	NSW	Listed place	In buffer area only

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Towra point nature reserve	Within Ramsar site	In feature area

Listed Threatened Ecological Communities			[Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community may occur within area	In feature area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area	In feature area
Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	Community likely to occur within area	In feature area

Community Name	Threatened Category	Presence Text	Buffer Status
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area	In feature area
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	Community likely to occur within area	In buffer area only
Eastern Suburbs Banksia Scrub of the Sydney Region	Critically Endangered	Community likely to occur within area	In feature area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In buffer area only
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion	Endangered	Community likely to occur within area	In buffer area only
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area	In feature area
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only
Turpentine-Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area	In buffer area only
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	Endangered	Community may occur within area	In buffer area only
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community may occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia			
Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Aphelocephala leucopsis			
Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Ardenna grisea			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Endangered	Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat likely to occur within area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In buffer area only
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat known to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
Xenus cinereus Terek Sandpiper [59300]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
FISH			
Epinephelus daemelii Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only
FROG			
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area	In feature area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eubalaena australis			
Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Isoodon obesulus obesulus			
Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat likely to occur within area	In feature area
Notamacropus parma			
Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Petauroides volans			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat likely to occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petrogale penicillata			
Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
Acacia baueri subsp. aspera			
[18662]	Endangered	Species or species habitat may occur within area	In buffer area only
Acacia bynoeana			
Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Acacia pubescens Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat known to occur within area	In feature area
Acacia terminalis subsp. Eastern Sydney (G.P.Phillips 126) listed as Acacia terminalis subsp. terminalis MS Sunshine Wattle (Sydney region) [91564]	Endangered	Species or species habitat known to occur within area	In feature area
Allocasuarina glareicola [21932]	Endangered	Species or species habitat may occur within area	In feature area
Asterolasia elegans [56780]	Endangered	Species or species habitat may occur within area	In buffer area only
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Darwinia biflora [14619]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Deyeuxia appressa [7438]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Eucalyptus camfieldii Camfield's Stringybark [15460]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat known to occur within area	In feature area
Grevillea parviflora subsp. parviflora Small-flower Grevillea [64910]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Haloragodendron lucasii Hal [6480]	Endangered	Species or species habitat may occur within area	In buffer area only
Hibbertia puberula subsp. glabrescens [86645]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Leucopogon exolasius Woronora Beard-heath [14251]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area	In feature area
Melaleuca deanei Deane's Melaleuca [5818]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Persoonia nutans Nodding Geebung [18119]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Pimelea curviflora var. curviflora [4182]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat likely to occur within area	In feature area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Prostanthera densa Villous Mintbush [12233]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterostylis saxicola Sydney Plains Greenhood [64537]	Endangered	Species or species habitat known to occur within area	In feature area
Pultenaea aristata [18062]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area	In feature area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thelymitra kangaloonica Kangaloon Sun Orchid [81861]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat known to occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Dermochelys coriacea](#)			
Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
[Eretmochelys imbricata](#)			
Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Hoplocephalus bungaroides](#)			
Broad-headed Snake [1182]	Endangered	Species or species habitat likely to occur within area	In feature area
[Natator depressus](#)			
Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
SHARK			
[Carcharias taurus (east coast population)](#)			
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Carcharodon carcharias](#)			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
[Galeorhinus galeus](#)			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
[Rhincodon typus](#)			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Sphyrna lewini](#)			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
SNAIL			
[Meridolum maryae](#)			
Maroubra Woodland Snail, Maroubra Land Snail [89884]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Pommerhelix duralensis](#)			
Dural Land Snail [85268]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Listed Migratory Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
[Anous stolidus](#)			
Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
[Apus pacificus](#)			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
[Ardenna carneipes](#)			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Ardenna grisea](#)			
Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Calonectris leucomelas](#)			
Streaked Shearwater [1077]		Species or species habitat known to occur within area	In buffer area only
[Diomedea antipodensis](#)			
Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Diomedea epomophora](#)			
Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Diomedea exulans](#)			
Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Diomedea sanfordi](#)			
Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In buffer area only
Sternula albifrons Little Tern [82849]		Breeding likely to occur within area	In buffer area only
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Migratory Marine Species			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat known to occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris alba Sanderling [875]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris ruficollis Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris subminuta Long-toed Stint [861]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris tenuirostris Great Knot [862]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Charadrius mongolus](#) Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Charadrius veredus](#) Oriental Plover, Oriental Dotterel [882]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Gallinago megala](#) Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Gallinago stenura](#) Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Limicola falcinellus](#) Broad-billed Sandpiper [842]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Limosa lapponica](#) Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
[Limosa limosa](#) Black-tailed Godwit [845]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Numenius madagascariensis](#) Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
[Numenius minutus](#) Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Numenius phaeopus](#) Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Pandion haliaetus](#) Osprey [952]		Species or species habitat known to occur within area	In feature area
[Pluvialis fulva](#) Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Pluvialis squatarola](#) Grey Plover [865]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Tringa brevipes](#) Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Tringa incana](#) Wandering Tattler [831]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area	In feature area
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Australian National University		
Commonwealth Land - Australian National University [13156]	NSW	In buffer area only
Commonwealth Bank of Australia		
Commonwealth Land - Commonwealth Bank of Australia [14408]	NSW	In buffer area only
Commonwealth Land - Commonwealth Bank of Australia [14406]	NSW	In buffer area only
Commonwealth Land - Commonwealth Bank of Australia [14407]	NSW	In buffer area only
Commonwealth Land - Commonwealth Bank of Australia [14331]	NSW	In buffer area only
Commonwealth Trading Bank of Australia		
Commonwealth Land - Commonwealth Trading Bank of Australia [14323]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [14322]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [14477]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [14325]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [14337]	NSW	In buffer area only
Communications, Information Technology and the Arts - Australian Broadcasting Corporation		
Commonwealth Land - Australian Broadcasting Corporation [15511]	NSW	In buffer area only
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [14324]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [14328]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [15537]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [14329]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [15698]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13164]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [15538]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Australian Postal Commission [14391]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [14326]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [14384]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13091]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [14473]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [14366]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [14338]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13094]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [14348]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13040]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [13121]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [16021]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [14343]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [15898]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [16471]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [12072]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [12073]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [15603]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [14342]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [14422]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [14421]	NSW	In buffer area only
Commonwealth Land - Australia Post [15591]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian & Overseas Telecommunications Corporation [14458]	NSW	In buffer area only
Commonwealth Land - Australian & Overseas Telecommunications Corporation [13155]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14388]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Australian Telecommunications Commission [13157]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14409]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14402]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14405]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13097]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14381]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14285]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13154]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12069]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13093]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14443]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14383]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12116]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14418]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14415]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14414]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14417]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14416]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14463]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Australian Telecommunications Commission [16448]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14379]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13162]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [14327]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13092]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13019]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [13095]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14341]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14442]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [15504]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [12076]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [12075]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14385]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14368]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14340]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14412]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14410]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14339]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14332]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14333]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [14349]	NSW	In buffer area only
Defence		
Commonwealth Land - Defence Service Homes Corporation [14352]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [12117]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Service Homes Corporation [13054]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation & Alice Isabel Patterson [14377]	NSW	In buffer area only
Commonwealth Land - Director of Defence Service Homes [14425]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11098]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11099]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11103]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11108]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11101]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11106]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11105]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11107]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11100]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11102]	NSW	In buffer area only
Defence - 21 CONST REGT - HABERFIELD DEPOT [11104]	NSW	In buffer area only
Defence - BANKSMEADOW DEPOT (Sydney Workshop Company) [11116]	NSW	In buffer area only
Defence - BANKSMEADOW DEPOT (Sydney Workshop Company) [11117]	NSW	In buffer area only
Defence - COCKATOO ISLAND DOCKYARD [10018]	NSW	In buffer area only
Defence - CONCORD OFFICE ACCN [11093]	NSW	In buffer area only
Defence - DEFENCE PLAZA SYDNEY [11179]	NSW	In buffer area only
Defence - DSTO PYRMONT - (SEE SITE 1177) [10015]	NSW	In buffer area only
Defence - DSTO PYRMONT - (SEE SITE 1177) [10017]	NSW	In buffer area only
Defence - DSTO PYRMONT - (SEE SITE 1177) [10016]	NSW	In buffer area only
Defence - FOREST LODGE (SYDNEY) TRG DEP [10071]	NSW	In buffer area only
Defence - HURSTVILLE TRG DEP [11109]	NSW	In buffer area only
Defence - KENSINGTON DEPOT [11110]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - LEICHHARDT STORES DEPOT [11112]	NSW	In buffer area only
Defence - LIDCOMBE MULTI-USER DEPOT [11115]	NSW	In buffer area only
Defence - LIDCOMBE MULTI-USER DEPOT [11114]	NSW	In buffer area only
Defence - LIDCOMBE MULTI-USER DEPOT [11113]	NSW	In buffer area only
Defence - MATERIAL RESEARCH LAB [10013]	NSW	In buffer area only
Defence - OXFORD ST SYDNEY [11165]	NSW	In buffer area only
Defence - OXFORD ST SYDNEY [11166]	NSW	In buffer area only
Defence - OXFORD ST SYDNEY [11164]	NSW	In buffer area only
Defence - OXFORD ST SYDNEY [11167]	NSW	In buffer area only
Defence - OXFORD ST SYDNEY [11168]	NSW	In buffer area only
Defence - OXFORD ST SYDNEY [11169]	NSW	In buffer area only
Defence - PARKVIEW BUILDING - SYDNEY [11170]	NSW	In buffer area only
Defence - ROCKDALE TRAINING DEPOT [11111]	NSW	In buffer area only
Defence - SPECTACLE ISLAND [10036]	NSW	In buffer area only
Defence - SPECTACLE ISLAND [10037]	NSW	In buffer area only
Defence - SPECTACLE ISLAND [10038]	NSW	In buffer area only
Defence - SPECTACLE ISLAND [10035]	NSW	In buffer area only
Defence - SYDNEY UNIVERSITY REGIMENT - DARLINGTON [11094]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11086]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11082]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11084]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11085]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11089]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11090]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11092]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11078]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11075]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Defence - ZETLAND NAVY SUPPLY CENTRE [11077]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11076]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11087]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11080]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11081]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11079]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11088]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11083]	NSW	In buffer area only
Defence - ZETLAND NAVY SUPPLY CENTRE [11091]	NSW	In buffer area only
Defence - Defence Housing Authority		
Commonwealth Land - Defence Housing Authority [16093]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14470]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16135]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14462]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16134]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15944]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [13096]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14469]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14455]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14454]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14459]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14457]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14456]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14450]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14453]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14380]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16491]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [15712]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14419]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16028]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16048]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14447]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14446]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14448]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16117]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16056]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16058]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12071]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12074]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12118]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14449]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16132]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14347]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15945]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14346]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14344]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14345]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [12070]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14411]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14468]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16133]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14461]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14403]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15711]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [14467]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14330]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16046]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16047]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16045]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15441]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15486]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15619]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15956]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15887]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [14464]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16356]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14474]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [12100]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14367]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14413]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14423]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [14424]	NSW	In buffer area only
Commonwealth Land - War Service Homes Commissioner [13015]	NSW	In buffer area only
Transport and Regional Services - Airservices Australia		
Commonwealth Land - Airservices Australia [14389]	NSW	In buffer area only
Commonwealth Land - Airservices Australia [13098]	NSW	In buffer area only
Commonwealth Land - Airservices Australia [14465]	NSW	In buffer area only
Unknown		
Commonwealth Land - [14372]	NSW	In buffer area only
Commonwealth Land - [15530]	NSW	In buffer area only
Commonwealth Land - [16562]	NSW	In buffer area only
Commonwealth Land - [15435]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [15434]	NSW	In buffer area only
Commonwealth Land - [15539]	NSW	In buffer area only
Commonwealth Land - [15436]	NSW	In buffer area only
Commonwealth Land - [14387]	NSW	In buffer area only
Commonwealth Land - [14382]	NSW	In buffer area only
Commonwealth Land - [16283]	NSW	In buffer area only
Commonwealth Land - [14374]	NSW	In buffer area only
Commonwealth Land - [16160]	NSW	In buffer area only
Commonwealth Land - [16161]	NSW	In buffer area only
Commonwealth Land - [14376]	NSW	In buffer area only
Commonwealth Land - [16159]	NSW	In buffer area only
Commonwealth Land - [14393]	NSW	In buffer area only
Commonwealth Land - [14390]	NSW	In buffer area only
Commonwealth Land - [14395]	NSW	In buffer area only
Commonwealth Land - [14392]	NSW	In buffer area only
Commonwealth Land - [14398]	NSW	In buffer area only
Commonwealth Land - [14399]	NSW	In buffer area only
Commonwealth Land - [11160]	NSW	In buffer area only
Commonwealth Land - [14401]	NSW	In buffer area only
Commonwealth Land - [14397]	NSW	In buffer area only
Commonwealth Land - [14396]	NSW	In buffer area only
Commonwealth Land - [15670]	NSW	In buffer area only
Commonwealth Land - [15503]	NSW	In buffer area only
Commonwealth Land - [14400]	NSW	In buffer area only
Commonwealth Land - [13987]	NSW	In buffer area only
Commonwealth Land - [16116]	NSW	In buffer area only
Commonwealth Land - [14364]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [14386]	NSW	In buffer area only
Commonwealth Land - [14365]	NSW	In buffer area only
Commonwealth Land - [15690]	NSW	In buffer area only
Commonwealth Land - [14394]	NSW	In buffer area only
Commonwealth Land - [14373]	NSW	In buffer area only
Commonwealth Land - [14334]	NSW	In buffer area only
Commonwealth Land - [14335]	NSW	In buffer area only
Commonwealth Land - [14370]	NSW	In buffer area only
Commonwealth Land - [14371]	NSW	In buffer area only
Commonwealth Land - [14336]	NSW	In buffer area only
Commonwealth Land - [14375]	NSW	In buffer area only
Commonwealth Land - [13120]	NSW	In buffer area only
Commonwealth Land - [14378]	NSW	In buffer area only
Commonwealth Land - [15459]	NSW	In buffer area only
Commonwealth Land - [13122]	NSW	In buffer area only
Commonwealth Land - [15689]	NSW	In buffer area only
Commonwealth Land - [15688]	NSW	In buffer area only
Commonwealth Land - [14369]	NSW	In buffer area only
Commonwealth Land - [13123]	NSW	In buffer area only
Commonwealth Land - [15729]	NSW	In buffer area only
Commonwealth Land - [14420]	NSW	In buffer area only

Commonwealth Heritage Places			[Resource Information]
Name	State	Status	Buffer Status
Historic			
Barracks Block	NSW	Listed place	In buffer area only
Biloela Group	NSW	Listed place	In buffer area only
Botany Post Office	NSW	Listed place	In buffer area only
Cockatoo Island Industrial Conservation Area	NSW	Listed place	In buffer area only

Name	State	Status	Buffer Status
Fitzroy Dock	NSW	Listed place	In buffer area only
General Post Office	NSW	Listed place	In buffer area only
Marrickville Post Office	NSW	Listed place	In buffer area only
Mess Hall (former)	NSW	Listed place	In buffer area only
Military Guard Room	NSW	Listed place	In buffer area only
Power House / Pump House	NSW	Listed place	In buffer area only
Prison Barracks Precinct	NSW	Listed place	In buffer area only
Pyrmont Post Office	NSW	Listed place	In buffer area only
Snapper Island	NSW	Listed place	In buffer area only
Spectacle Island Explosives Complex	NSW	Listed place	In buffer area only
Sutherland Dock	NSW	Listed place	In buffer area only
Sydney Airport Air Traffic Control Tower	NSW	Listed place	In buffer area only
Underground Grain Silos	NSW	Listed place	In buffer area only
Woolwich Dock	NSW	Listed place	In buffer area only

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Anous stolidus Common Noddy [825]		Species or species habitat likely to occur within area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Arenaria interpres Ruddy Turnstone [872]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Calidris alba Sanderling [875]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris pugnax as Philomachus pugnax Ruff [91256]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris ruficollis](#) Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
[Calidris subminuta](#) Long-toed Stint [861]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
[Calidris tenuirostris](#) Great Knot [862]	Vulnerable	Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
[Calonectris leucomelas](#) Streaked Shearwater [1077]		Species or species habitat known to occur within area	In buffer area only
[Charadrius bicinctus](#) Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Charadrius mongolus](#) Lesser Sand Plover, Mongolian Plover [879]	Endangered	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Charadrius ruficapillus](#) Red-capped Plover [881]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
[Charadrius veredus](#) Oriental Plover, Oriental Dotterel [882]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Breeding known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Limosa limosa Black-tailed Godwit [845]	Endangered	Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area overfly marine area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
Pluvialis squatarola Grey Plover [865]	Vulnerable	Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Sterna striata White-fronted Tern [799]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding likely to occur within area	In buffer area only
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Thalassarche salvini](#) Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
[Thalassarche steadi](#) White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Tringa brevipes as Heteroscelus brevipes](#) Grey-tailed Tattler [851]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Tringa incana as Heteroscelus incanus](#) Wandering Tattler [831]		Foraging, feeding or related behaviour known to occur within area	In buffer area only
[Tringa nebularia](#) Common Greenshank, Greenshank [832]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
[Tringa stagnatilis](#) Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
[Xenus cinereus](#) Terek Sandpiper [59300]	Vulnerable	Foraging, feeding or related behaviour known to occur within area overfly marine area	In buffer area only
Fish			
[Acentronura tentaculata](#) Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In buffer area only
[Festucalex cinctus](#) Girdled Pipefish [66214]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In buffer area only
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may occur within area	In buffer area only
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat known to occur within area	In buffer area only
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In buffer area only
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Solenostomus cyanopterus](#) Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In buffer area only
[Solenostomus paradoxus](#) Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In buffer area only
[Stigmatopora argus](#) Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
[Stigmatopora nigra](#) Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
[Syngnathoides biaculeatus](#) Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
[Trachyrhamphus bicoarctatus](#) Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In buffer area only
[Urocampus carinirostris](#) Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
[Vanacampus margaritifer](#) Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Mammal			
[Arctocephalus forsteri](#) Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In buffer area only
[Arctocephalus pusillus](#) Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area	In buffer area only
[Dugong dugon](#) Dugong [28]		Species or species habitat may occur within area	In buffer area only
Reptile			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Hydrophis platura as Pelamis platurus Yellow-bellied Sea Snake [93746]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Whales and Other Cetaceans			[Resource Information]
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Georges River	National Park	NSW	In buffer area only
Parramatta River	Regional Park	NSW	In buffer area only
Sydney Harbour	National Park	NSW	In buffer area only
Towra Point	Nature Reserve	NSW	In buffer area only
Towra Point	Aquatic Reserve	NSW	In buffer area only
Wolli Creek	Regional Park	NSW	In feature area

Nationally Important Wetlands		[Resource Information]
Wetland Name	State	Buffer Status
Bicentennial Park	NSW	In buffer area only
Botany Wetlands	NSW	In buffer area only

Wetland Name	State	Buffer Status
Eve St. Marsh, Arncliffe	NSW	In buffer area only
Towra Point Estuarine Wetlands	NSW	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Circular Quay Renewal	2023/09727		Assessment	In buffer area only
Parramatta Light Rail Stage 2	2022/09300		Post-Approval	In buffer area only
Controlled action				
Construction and operation of the Westconnex New M5, Sydney, NSW	2015/7520	Controlled Action	Post-Approval	In feature area
Cook Cove Southern Precinct development, Sydney, NSW	2016/7767	Controlled Action	Post-Approval	In buffer area only
Cooks Cove Development Project	2006/2685	Controlled Action	Post-Approval	In buffer area only
Expansion of Port Botany facilities	2002/543	Controlled Action	Post-Approval	In buffer area only
Sand Reclamation to Towra Beach	2003/1085	Controlled Action	Post-Approval	In feature area
Southern section of the Bonnie Doon Golf Course, Pagewood, NSW	2015/7479	Controlled Action	Completed	In buffer area only
Not controlled action				
2A and 2B Mavis Street, Revesby	2020/8665	Not Controlled Action	Completed	In buffer area only
Botany Rail Duplication	2019/8566	Not Controlled Action	Completed	In buffer area only
BP/Mobil Pipeline to Kingsford Smith Airport	2000/104	Not Controlled Action	Completed	In buffer area only
Bushfire risk reduction works Rookwood Cemetery	2007/3835	Not Controlled Action	Completed	In buffer area only
construct access road and install underground water main	2005/2299	Not Controlled Action	Completed	In buffer area only
Construct and operate an aerial adventure park	2012/6239	Not Controlled Action	Completed	In buffer area only
Construction, operation and maintenance of a new zone substation	2011/5901	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
construction of a road linking Newbridge Road and Nuwarra Road	2004/1843	Not Controlled Action	Completed	In buffer area only
Construction Of Two New Fuel Processing Plants On Existing Site	2003/1243	Not Controlled Action	Completed	In buffer area only
Cox's Creek Reserve	2001/409	Not Controlled Action	Completed	In buffer area only
Decommissioning of Army Depot, Haberfield	2001/217	Not Controlled Action	Completed	In buffer area only
Decommissioning of NMC and Camperdown Facility	2010/5645	Not Controlled Action	Completed	In buffer area only
Demolition of Ablutions Block, Snapper Island, NSW	2018/8303	Not Controlled Action	Completed	In buffer area only
Development of an Intermodal Terminal for containerised freight at the former En	2002/622	Not Controlled Action	Completed	In buffer area only
Development of Surplus Land at the Potts Hill Reservoirs Site for Residential an	2009/4962	Not Controlled Action	Completed	In buffer area only
Enfield Industrial Subdivision	2007/3727	Not Controlled Action	Completed	In buffer area only
Environmental Works	2001/396	Not Controlled Action	Completed	In buffer area only
Extension of Hale Street to Foreshore Road and Associated Works	2008/4035	Not Controlled Action	Completed	In buffer area only
Extension to Lucas Heights production building	2003/1114	Not Controlled Action	Completed	In buffer area only
Fitout works, 4th Floor, Sydney Customs House, 31 Alfred Street	2004/1449	Not Controlled Action	Completed	In buffer area only
Fuel Reduction Proposal Redfield Road, East Killara	2003/1238	Not Controlled Action	Completed	In buffer area only
Georges River Program 2	2003/999	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Industrial Subdivision	2004/1859	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Industrial Subdivision, 262-276 Captain Cook Drive	2004/1899	Not Controlled Action	Completed	In buffer area only
Installation of viewing platform	2005/2138	Not Controlled Action	Completed	In buffer area only
Noxious weed removal and controlled burn	2003/1272	Not Controlled Action	Completed	In buffer area only
Rabbit Control Anzac Rifle Range	2005/1940	Not Controlled Action	Completed	In buffer area only
Redevelopment of the Cronulla Sharks Leagues Club	2011/5889	Not Controlled Action	Completed	In buffer area only
Rehabilitation works of the Coogee Sewer Diversion Submain - Maxwell Avenue, Mar	2004/1683	Not Controlled Action	Completed	In buffer area only
Remediation of Contaminated Buildings	2005/1983	Not Controlled Action	Completed	In buffer area only
Remediation of Contaminated Soil	2005/1985	Not Controlled Action	Completed	In buffer area only
Residential subdivision works, Spurway St, Ermington	2003/1130	Not Controlled Action	Completed	In buffer area only
Shipment of Spent Nuclear Fuel to USA	2007/3672	Not Controlled Action	Completed	In feature area
subdivision and development on the Rhodes Peninsula for residential and commerci	2003/1249	Not Controlled Action	Completed	In buffer area only
Subdivision and sale of Commonwealth land in Pymble to Ku-ring-gai City Council	2004/1368	Not Controlled Action	Completed	In buffer area only
Supply of a gigabit ethernet connection with associated trenching, boring and ha	2007/3637	Not Controlled Action	Completed	In buffer area only
Sydney Desalination Plant	2005/2331	Not Controlled Action	Completed	In feature area
Sydney Metro Network Stage 2	2010/5307	Not Controlled Action	Completed	In buffer area only
Sydney Primary Loop Gas Pipeline	2006/2622	Not Controlled Action	Completed	In buffer area only
Undertake a controlled burn of the Eastern Suburbs Banksia Scrub at Byrne Cresce	2004/1728	Not Controlled Action	Completed	In buffer area only
V8 Supercars "Sydney 400" Event	2009/4782	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Widening of the M5 Southwest Motorway	2010/5665	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Kareela, Garnet Road Rezoning	2020/8841	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Kareela Flying-fox Camp and Camellia Gardens Dispersal 2017	2017/7920	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Moriah Primary School, Centennial Park, Sydney	2004/1676	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Site 68, Sydney Olympic Park mixed development, Homebush, NSW	2015/7445	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Transport of intermediate level radioactive waste to Lucas Heights, NSW	2015/7437	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Transport of OPAL Spent Fuel to France in 2018 and 2025	2016/7841	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Trial dispersal of Kareela Flying-fox camp, Bates Drive, Kareela, NSW	2015/7474	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Veg removal to increase buffer betwn Kareela GHFF camp & residences & school, Kareela, NSW	2014/7222	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In buffer area only
Construction, operation and maintenance of a new zone substation	2011/5897	Referral Decision	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Referral decision				
Relocation of Grey-Headed Flying-Fox Colony	2008/4568	Referral Decision	Completed	In buffer area only
Summer Hill Flour Mills Residential & Commercial development	2011/5859	Referral Decision	Completed	In buffer area only

Biologically Important Areas

[Resource Information]

Scientific Name	Behaviour	Presence	Buffer Status
Dolphins			
Tursiops aduncus			
Indo-Pacific/Spotted Bottlenose Dolphin [68418]	Breeding	Likely to occur	In buffer area only
Sharks			
Carcharias taurus			
Grey Nurse Shark [64469]	Foraging	Known to occur	In buffer area only

Bioregional Assessments

[Resource Information]

SubRegion	BioRegion	Website	Buffer Status
Sydney	Sydney Basin	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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Appendix D – BioNet Search Results

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and may contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°C; ^^ rounded to 0.01°C. Copyright the State of NSW through the Department of Planning, Industry and Environment. Search criteria : Public Report of all Valid Records of Threatened (listed on BC Act 2016) ,Commonwealth listed ,CAMBA listed or JAMBA listed Entities in selected area [North: -33.89 West: 151.08 East: 151.18 South: -33.99] recorded since 01 Jan 2004 until 14 Report generated on 14/06/2024 4:43 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records	Info
Animalia	Amphibia	Hylidae	3166	*Litoria aurea*		Green and Golden Bell Frog	E1,P	V	656	
Animalia	Reptilia	Cheloniidae	2004	*Caretta caretta*		Loggerhead Turtle	E1,P	E	3	
Animalia	Aves	Columbidae	0023	*Ptilinopus superbus*		Superb Fruit-Dove	V,P		3	
Animalia	Aves	Apodidae	0335	*Apus pacificus*		Fork-tailed Swift	P	C,J,K	1	
Animalia	Aves	Apodidae	0334	*Hirundapus*		White-throated Needletail	V,P	V,C,J,K	3	
Animalia	Aves	Procellariidae	0069	*Ardenna pacifica*		Wedge-tailed Shearwater	P	J	2	
Animalia	Aves	Procellariidae	0071	*Ardenna tenuirostris*		Short-tailed Shearwater	P	C,J,K	2	
Animalia	Aves	Ardeidae	0196	*Ixobrychus flavicollis*		Black Bittern	V,P		2	
Animalia	Aves	Accipitridae	0225	*Hieraaetus*		Little Eagle	V,P		2	
Animalia	Aves	Haematopodidae	0130	*Haematopus longirostris*		Pied Oystercatcher	E1,P		2	
Animalia	Aves	Charadriidae	8006	*Pluvialis fulva*		Pacific Golden Plover	P	C,J,K	1	
Animalia	Aves	Charadriidae	0136	*Pluvialis squatarola*		Grey Plover	P	C,J,K	2	
Animalia	Aves	Scolopacidae	0157	*Actitis hypoleucos*		Common Sandpiper	P	C,J,K	1	
Animalia	Aves	Scolopacidae	0163	*Calidris acuminata*		Sharp-tailed Sandpiper	P	C,J,K	6	
Animalia	Aves	Scolopacidae	0161	*Calidris ferruginea*		Curlew Sandpiper	E1,P	CE,C,J,K	1	
Animalia	Aves	Scolopacidae	0168	*Gallinago hardwickii*		Latham's Snipe	P	J,K	2	
Animalia	Aves	Scolopacidae	0153	*Limosa lapponica*		Bar-tailed Godwit	P	C,J,K	4	
Animalia	Aves	Scolopacidae	8781	*Limosa lapponica*		Bar-tailed Godwit (baueri)	P	V	1	
Animalia	Aves	Scolopacidae	0149	*Numenius madagascariensis*		Eastern Curlew	P	CE,C,J,K	1	
Animalia	Aves	Scolopacidae	0155	*Tringa brevipes*		Grey-tailed Tattler	P	C,J,K	1	
Animalia	Aves	Laridae	0112	*Hydroprogne caspia*		Caspian Tern	P	J	1	
Animalia	Aves	Laridae	0115	*Thalasseus bergii*		Crested Tern	P	J	7	
Animalia	Aves	Cacatuidae	8862	*^Calyptorhynchus lathami lathami*		South-eastern Glossy Black-Cockatoo	V,P,2	V	1	
Animalia	Aves	Psittacidae	0260	*Glossopsitta pusilla*		Little Lorikeet	V,P		1	
Animalia	Aves	Psittacidae	0302	*^^Neophema*		Turquoise Parrot	V,P,3		1	
Animalia	Aves	Strigidae	0248	*^^Ninox strenua*		Powerful Owl	V,P,3		27	
Animalia	Aves	Artamidae	8519	*Artamus cyanopterus*		Dusky Woodswallow	V,P		2	
Animalia	Aves	Petroicidae	0380	*Petroica boodang*		Scarlet Robin	V,P		2	
Animalia	Aves	Petroicidae	0382	*Petroica phoenicea*		Flame Robin	V,P		1	
Animalia	Aves	Estrildidae	0652	*Stagonopleura*		Diamond Firetail	V,P	V	1	
Animalia	Mammalia	Peramelidae	1097	*Perameles nasuta*		Long-nosed Bandicoot population in inner western Sydney	E2,P		22	
Animalia	Mammalia	Phascolarctidae	1162	*Phascolarctos cinereus*		Koala	E1,P	E	2	
Animalia	Mammalia	Pteropodidae	1280	*Pteropus*		Grey-headed Flying-fox	V,P	V	1320	
Animalia	Mammalia	Emballonuridae	1321	*Saccolaimus flaviventris*		Yellow-bellied Sheathtail-bat	V,P		4	
Animalia	Mammalia	Vespertilionidae	1357	*Myotis macropus*		Southern Myotis	V,P		1	
Animalia	Mammalia	Vespertilionidae	1361	*Scoteanax rueppellii*		Greater Broad-nosed Bat	V,P		1	
Animalia	Mammalia	Miniopterida	1346	*Miniopterus*		Little Bent-winged Bat	V,P		2	
Animalia	Mammalia	Miniopteridae	3330	*Miniopterus orianae oceanensis*		Large Bent-winged Bat	V,P		26	
Plantae	Flora	Fabaceae (Mimosoidea)	3857	*Acacia prominens*		Gosford Wattle, Hurstville and Kogarah Local Government Areas	E2		1	
Plantae	Flora	Fabaceae (Mimosoidea	3860	*Acacia pubescens*		Downy Wattle	V	V	3	

Plantae	Flora	Fabaceae (Mimosoidea	15210	*Acacia terminalis subsp. Eastern*	Sunshine wattle	E1	E	5
Fungi	Flora	Hygrophoraceae	F001	*Hygrocybe austropratensis*		E1		6
Plantae	Flora	Myrtaceae	4293	*Syzygium*	Magenta Lilly Pilly	E1	V	17
Plantae	Flora	Rhamnaceae	5591	*Pomaderris prunifolia*	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	E2		1

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