



# Transport Access Program

# **Canley Vale Station Upgrade**

## Review of Environmental Factors



*Artist's impression of the proposed Canley Vale Station Upgrade, subject to detailed design*



# **Canley Vale Station Upgrade Review of Environmental Factors**

**Transport Access Program  
Ref – 6427989**

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## Document control

<b>Status:</b>	Final
<b>Date of issue:</b>	April 2020
<b>Version:</b>	4.0
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## Abbreviations

Term	Meaning
<b>AHIMS</b>	Aboriginal Heritage Information Management System
<b>AS</b>	Australian Standard
<b>BC Act</b>	<i>Biodiversity Conservation Act 2016 (NSW)</i>
<b>BS</b>	British Standard
<b>BAZ</b>	Boarding Assistance Zone
<b>CBD</b>	Central Business District
<b>CEMP</b>	Construction Environmental Management Plan
<b>CCTV</b>	Closed circuit TV
<b>CLM Act</b>	<i>Contaminated Land Management Act 1997 (NSW)</i>
<b>CLMP</b>	Community Liaison Management Plan
<b>CNVMP</b>	Construction Noise and Vibration Management Plan
<b>CPTED</b>	Crime Prevention Through Environmental Design
<b>CTMP</b>	Construction Traffic Management Plan
<b>dBA</b>	Decibels (A-weighted)
<b>DDA</b>	<i>Disability Discrimination Act 1992 (Cwlth)</i>
<b>DAWE</b>	Commonwealth Department of Agriculture, Water and the Environment
<b>DPIE</b>	NSW Department of Planning, Industry and Environment
<b>DSAPT</b>	<i>Disability Standards for Accessible Public Transport (2002)</i>
<b>ECM</b>	Environmental Controls Map
<b>EES</b>	NSW Environment, Energy and Science (Division of Department of Planning Industry and Environment) (formerly OEH)
<b>EMS</b>	Environmental Management System
<b>EPA</b>	Environment Protection Authority
<b>EP&amp;A Act</b>	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
<b>EP&amp;A Regulation</b>	<i>Environmental Planning and Assessment Regulation 2000 (NSW)</i>
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
<b>EPL</b>	Environment Protection Licence
<b>ESD</b>	Ecologically Sustainable Development (refer to Definitions)

<b>Term</b>	<b>Meaning</b>
<b>FM Act</b>	<i>Fisheries Management Act 1994 (NSW)</i>
<b>Heritage Act</b>	<i>Heritage Act 1977 (NSW)</i>
<b>ICNG</b>	<i>Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009).</i>
<b>Infrastructure SEPP</b>	<i>State Environmental Planning Policy (Infrastructure) 2007 (NSW)</i>
<b>IS rating</b>	Infrastructure Sustainability rating under ISCA rating tool (v 2.0)
<b>ISCA</b>	Infrastructure Sustainability Council of Australia
<b>LEP</b>	Local Environmental Plan
<b>LGA</b>	Local Government Area
<b>MCA</b>	Multi-Criteria Analysis
<b>NES</b>	National Environmental Significance (refers to matters of National Environmental Significance under the EPBC Act)
<b>NPW Act</b>	<i>National Parks and Wildlife Act 1974 (NSW)</i>
<b>NSW</b>	New South Wales
<b>OEH</b>	Formerly NSW Office of the Environment and Heritage
<b>PoEO Act</b>	<i>Protection of the Environment Operations Act 1997 (NSW)</i>
<b>REF</b>	Review of Environmental Factors (this document)
<b>Roads Act</b>	<i>Roads Act 1993 (NSW)</i>
<b>SEPP</b>	State Environmental Planning Policy
<b>SoHI</b>	Statement of Heritage Impact
<b>SHI</b>	State Heritage Inventory
<b>SHR</b>	State Heritage Register
<b>SREP</b>	Sydney Regional Environmental Plan
<b>TAP</b>	Transport Access Program
<b>TfNSW</b>	Transport for NSW
<b>TGSI</b>	Tactile Ground Surface Indicators
<b>TPZ</b>	Tree Protection Zone
<b>WARR Act</b>	<i>Waste Avoidance and Resource Recovery Act 2001 (NSW)</i>
<b>WM Act</b>	<i>Water Management Act 2000 (NSW)</i>
<b>WSUD</b>	Water Sensitive in Urban Design



# Definitions

Term	Meaning
<b>Asset Standards Authority</b>	The ASA is an independent body within TfNSW, responsible for engineering governance, assurance of design safety, and ensuring the integrity of transport and infrastructure assets.
<b>Concept design</b>	The concept design is the preliminary design presented in this REF, which would be refined by the Construction Contractor (should the Proposal proceed) to a design suitable for construction (subject to TfNSW acceptance).
<b>Construction Contractor</b>	The entity appointed by TfNSW to undertake the construction of the Proposal. The Construction Contractor is therefore responsible for all work on the project, both design and construction
<b>Determining Authority</b>	A Minister or public authority on whose behalf an activity is to be carried out or public authority whose approval is required to carry out an activity (under Division 5.1 of the EP&A Act).
<b>Disability Standards for Accessible Public Transport</b>	The Commonwealth <i>Disability Standards for Accessible Public Transport 2002</i> (as amended) are a set of legally enforceable standards, authorised under the Commonwealth <i>Disability Discrimination Act 1992</i> (DDA) for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
<b>Ecologically Sustainable Development</b>	As defined by clause 7(4) Schedule 2 of the EP&A Regulation. Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.
<b>Feasible</b>	A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.
<b>Interchange</b>	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.
<b>Out of hours works</b>	Defined as work <i>outside</i> standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
<b>Proponent</b>	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act.
<b>Proposal</b>	The construction and operation of the Canley Vale Station Upgrade
<b>Rail Possession</b>	A rail possession is the term used by railway building/maintenance personnel to indicate that they have taken possession of the track (usually a section of track) for a specified period, where no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
<b>Reasonable</b>	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.

Term	Meaning
<b>Sensitive receivers</b>	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
<b>The Proposal</b>	The construction and operation of the Canley Vale Station Upgrade.
<b>Vegetation Offset Guide</b> (TfNSW, 2019)	The TfNSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 5.5 of the EP&A Act.

# Executive summary

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## Overview

Transport for New South Wales (TfNSW) is proposing to undertake the Canley Vale Station Upgrade (the Proposal) to improve accessibility at this location. TfNSW is the government agency responsible for the delivery of major transport infrastructure projects in NSW and is the proponent for the Proposal.

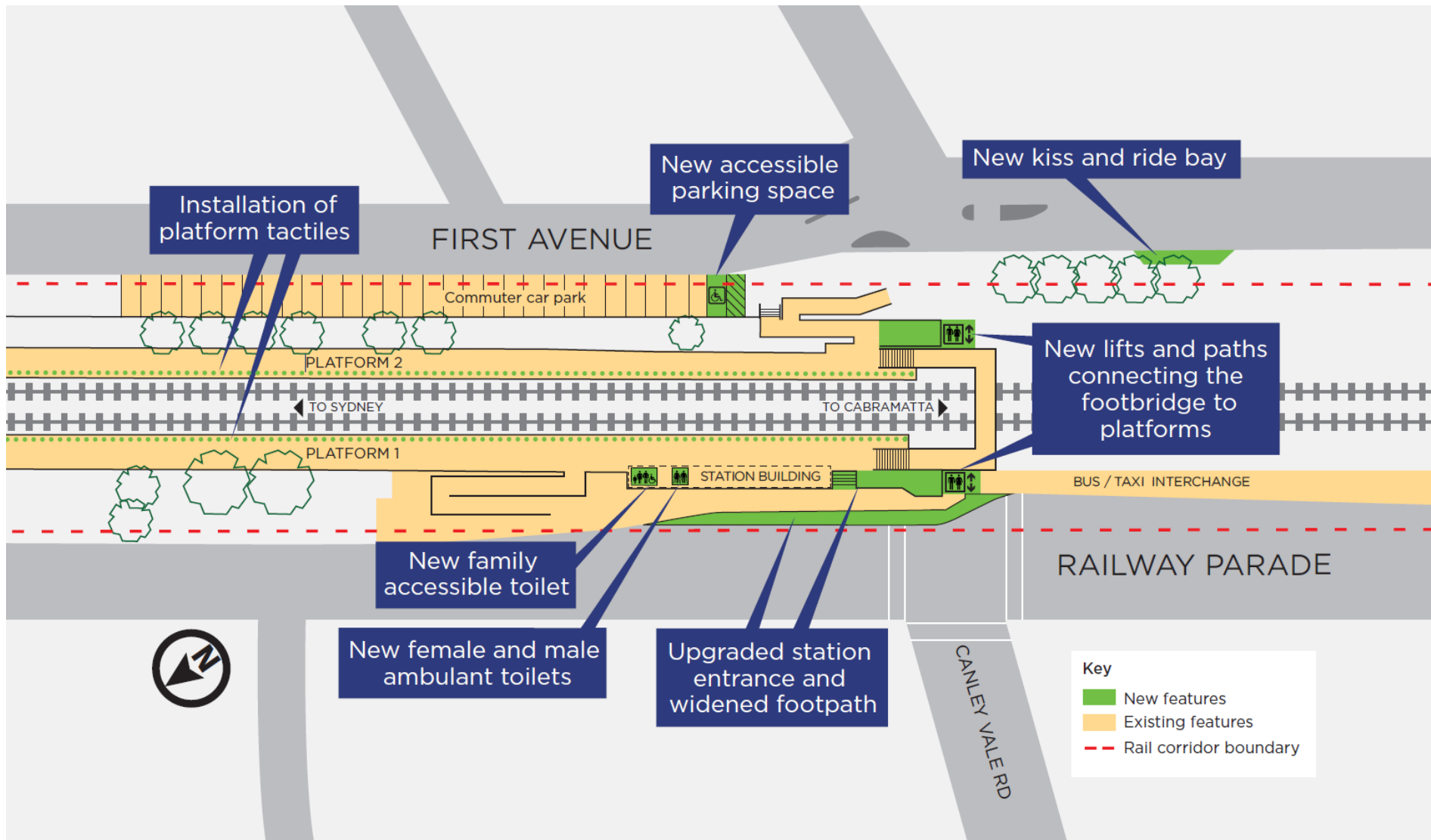
The proposal forms part of the Transport Access Program, a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern secure and integrated transport infrastructure.

The Proposal would aim to provide:

- installation of a three stop lift on the Railway Parade (western) side of station, connecting street level, Platform 1 and the footbridge
- installation of a lift on the First Avenue (eastern) side of station, connecting Platform 2 to the footbridge
- extension of the existing footbridge at both ends to connect to the new lift lobbies
- new handrails along existing footbridge and stairs
- upgrade the station entry from Railway Parade to Platform 1 including widened entry stairs
- widened footpath on Railway Parade
- new accessible parking space to be provided within the First Avenue commuter car park
- new accessible kiss and ride bay to be provided on First Avenue
- provision of DSAPT compliant accessible paths from First Avenue to the station entry
- improved amenities, including new female and male ambulant toilets and family accessible toilet provisions
- localised platform regrading to allow for accessible paths of travel
- ancillary work including upgrades to lighting Opal card readers, CCTV cameras, hearing loops, and installation of tactile ground surface indicators (TGSIs).

This Review of Environmental Factors (REF) has been prepared to assess the environmental impacts associated with the construction and operation of the Proposal under the provisions of Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

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



**Figure 1 Proposed Canley Vale Station Upgrade (subject to change during detailed design)**

## Need for the Proposal

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

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

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

## Community and stakeholder consultation

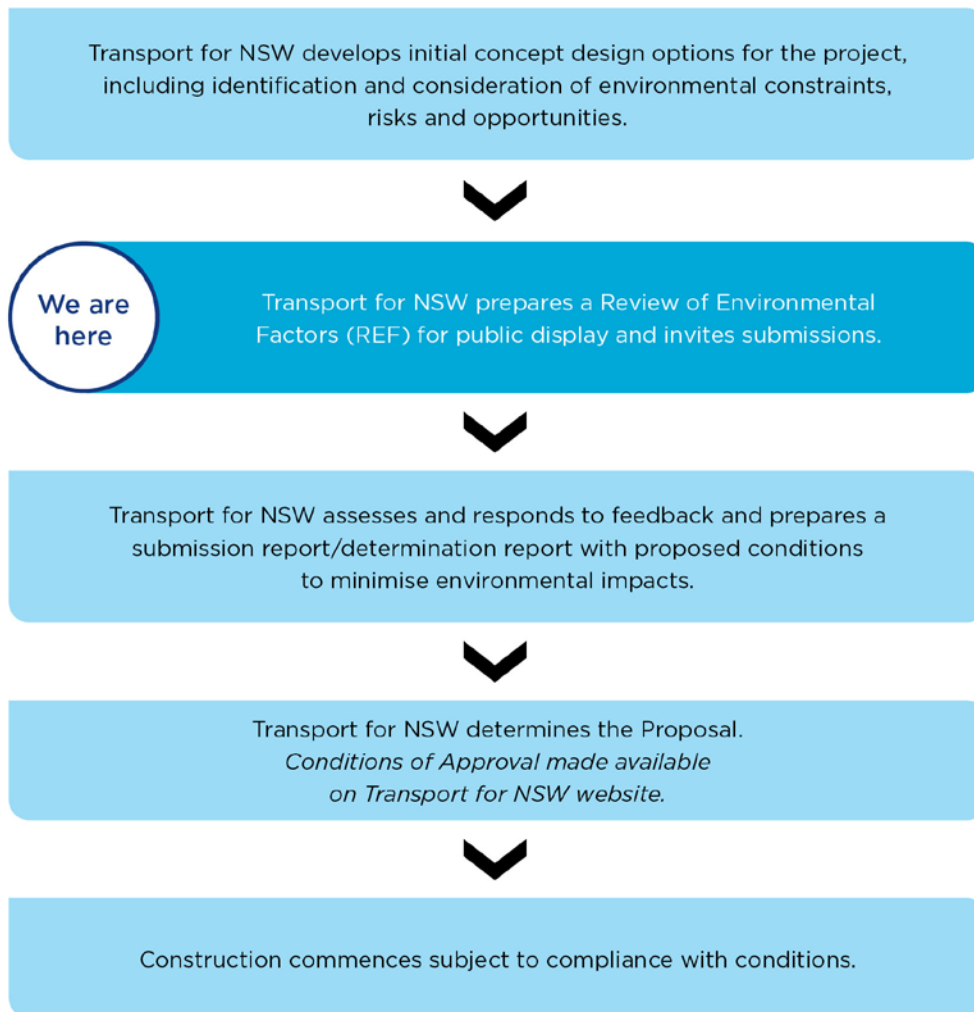
Community consultation activities for the Proposal would be undertaken during the public display period of this REF and the public invited to submit feedback to help TfNSW understand what is important to customers and the community. The REF would be displayed for a period of two weeks. Further information about these specific activities is included in Section 5 of this REF.

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

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

In accordance with the requirements of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP), consultation is required with local councils and/or public authorities in certain circumstances, including where council managed infrastructure is affected. Consultation has been undertaken with Fairfield City Council during the development of the concept design. Consultation with Council would continue through the detailed design and construction phases of the Proposal.

Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure 2 shows the planning approval and consultation process for the Proposal.



**Figure 2 Planning approval and consultation process for the Proposal**

## **Environmental impact assessment**

This REF identifies the potential environmental benefits and impacts of the Proposal and outlines the mitigation measures to reduce the identified impacts. A visual representation of the Proposal is provided in Figure 3.

The Proposal would provide the following benefits:

- improved and equitable access to Canley Vale Station for customers resulting from the installation of lifts, accessible parking, a formalised kiss and ride area and upgrades to the Railway Parade Station entry by widening stairs and footpath
- improved station amenity and safety for customers at the station by providing a family accessible toilet, male and female ambulant toilet, new signage, CCTV cameras and hearing loops.

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

- temporary changes to vehicle and pedestrian movements to, from and around the station during construction
- temporary noise and vibration impacts during construction

- impacts to the visual environment due to the inclusion of the lifts and modifications to the footbridge.

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

## Conclusion

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

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

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

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



**Figure 3 Visual representation of the Proposal (indicative only, subject to detailed design)**

# 1 Introduction

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

## 1.1 Overview

The NSW Government is committed to facilitating and encouraging the use of public transport, such as trains, by upgrading stations to make them more accessible, and improving interchanges around stations with other modes of transport such as bicycles, buses and cars. The Transport Access Program is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure where it is needed most.

### 1.1.1 Objectives of the Transport Access Program

The Transport Access Program aims to provide:

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

## 1.2 The Proposal

The Proposal forms part of the Transport Access Program. The key features of the Proposal are summarised as follows:

- installation of a three stop lift on the Railway Parade (western) side of station, connecting street level, Platform 1 and the footbridge
- installation of a lift on the First Avenue (eastern) side of station, connecting Platform 2 to the footbridge
- extension of the existing footbridge at both ends to connect to the new lift lobbies
- new handrails along existing footbridge and stairs
- upgrade the station entry from Railway Parade to Platform 1 including widened entry stairs
- widened footpath on Railway Parade
- new accessible parking space to be provided within the First Avenue commuter car park
- new accessible kiss and ride bay to be provided on First Avenue



- provision of DSAPT compliant accessible paths from First Avenue to the station entry
- improved amenities, including new female and male ambulant toilets and family accessible toilet provisions
- localised platform regrading to allow for accessible paths of travel
- ancillary work including upgrades to lighting Opal card readers, CCTV cameras, hearing loops, and installation of tactile ground surface indicators (TGSIs).

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

A detailed description of the Proposal is provided in Chapter 3 of this Review of Environmental Factors (REF). An overview of the key features of the Proposal is also provided in Figure 4.

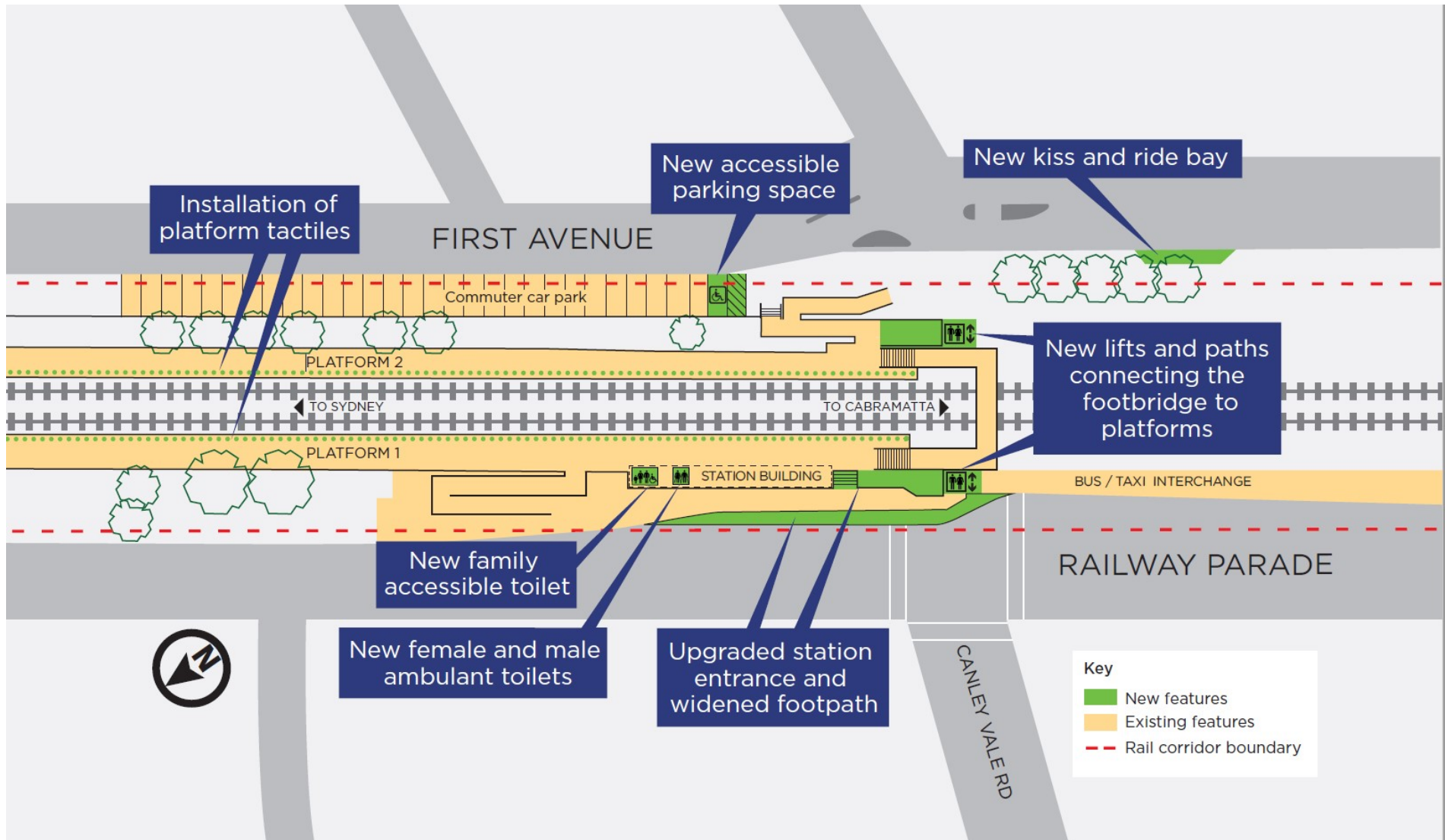


Figure 4 Proposed Canley Vale Station Upgrade (subject to change during detailed design)

### 1.3 Location and existing infrastructure

The Proposal is located in Canley Vale, a suburb about 30 km south west of the Sydney CBD in the City of Fairfield Local Government Area (LGA). The location of the Proposal in the regional context is shown in Figure 5.

The suburb and station precinct consists mostly of mixed residential and commercial land uses. Other notable features around the station precinct are shown in Figure 5. These include the Pal Buddhist School on the corner of First Avenue and Caroola Street, the Australian Chinese Descendants Mutual Aged (ACDMA) Hostel Association at the northern end of First Avenue and Orphan School Creek, which flows under the railway line about 45 metres north of the station precinct.

Canley Vale Railway Station services the Inner West and South Line and Cumberland Line and has two platforms which are accessed via a footbridge, stairs, and ramps.

The Proposal would involve work to the station precinct on land owned by RailCorp and operated and maintained by Sydney Trains. Some work is proposed along the footpaths that are under control of Fairfield City Council.

Canley Vale Station consists of two side platforms, the platform on the western side (Platform 1) providing services to Central and the City Circle via Granville on the T2 line and Richmond via Parramatta on the T5 line. The Platform on the eastern side (Platform 2) provides services to Leppington. The existing views of the Station from Railway Parade and First Avenue are shown in Figure 6 and Figure 7, respectively.

A station building is located on Platform 1 and contains:

- store room
- staff office and amenities
- communications room
- male and female toilets.

Platforms 1 and 2 are connected via a footbridge, which also provides the local community access across the rail corridor between Railway Parade and First Avenue.

The current station precinct and interchange facilities include:

- all day commuter parking on the eastern side of the station adjacent to Platform 2 on First Avenue
- a bus stop on the Eastern side of Railway Parade south of the station entry
- bus stops on the western side of Railway Parade (for night rides and rail possession services)
- bus stop on the southern side of Canley Vale Road
- taxi rank to the south of the bus stop on the Eastern side of Railway Parade
- bicycle racks are located on Railway Parade and First Avenue
- multi-storey commuter car park off Railway Parade approximately 150m from the station.

The Proposed work associated with the station platforms and buildings are in an area zoned as SP2 Infrastructure (Railway). Works outside the station and platform areas are located within the following zones:

- B2 – Local Centre (Railway Parade)
- R2 – Low Density Residential (First Avenue).

## Canley Vale Proposal Site - TAP3

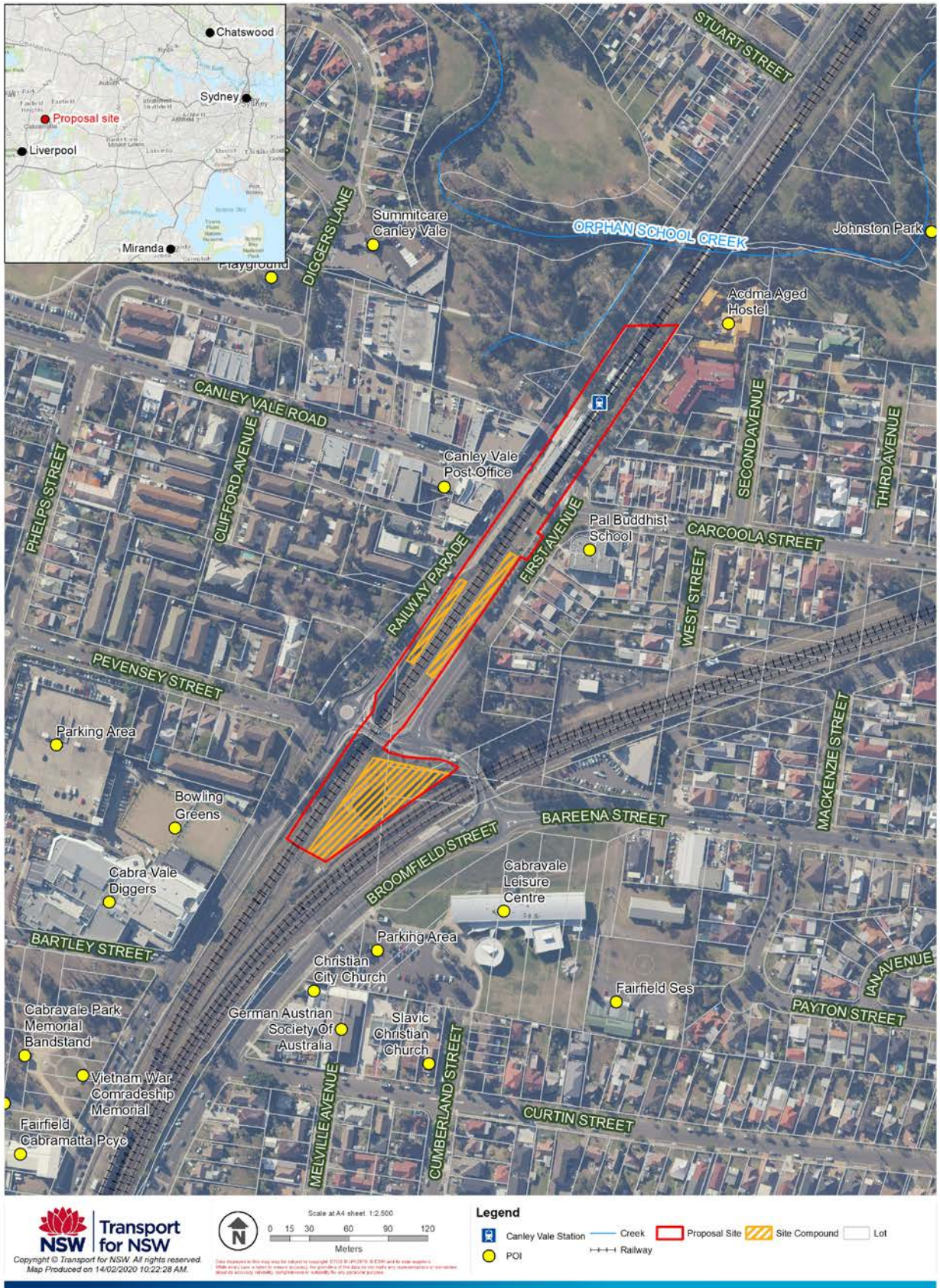


Figure 5 Proposal site and regional context



**Figure 6 Existing view of Canley Vale Station from Railway Parade**



**Figure 7 Existing view of Canley Vale Station from First Avenue**

## 1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by TfNSW to assess the potential impacts of the Canley Vale Station Upgrade. For the purposes of these works, TfNSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

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

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

Having regard to the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), this REF considers the potential for the Proposal to have a significant impact on matters of National Environmental Significance (NES) or Commonwealth land, and the need to make a referral to the Commonwealth Department of Agriculture, Water and the Environment (DoAWE) for any necessary approvals under the EPBC Act. Refer to Chapter 4 for more information on statutory considerations.

## 2 Need and options considered

### 2.1 Strategic justification

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

Public transport is also viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal.

The Canley Vale Station Upgrade forms part of the Transport Access Program, which is an initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure. The Proposal would improve accessibility of the station in line with the requirements of the *Disability Discrimination Act 1992* (DDA) (Commonwealth) and the *Disability Standards for Accessible Public Transport 2002* (DSAPT).

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

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

Policy/ Strategy	Overview	How the Proposal aligns
<b><i>Future Transport Strategy 2056</i></b> (TfNSW, 2018a)	<p>Future Transport 2056 is a suite of strategies and plans for transport to provide an integrated vision for the state.</p> <p>Future Transport 2056 identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include convenient access to transport, providing 30-minute access for customers to their nearest centre by public transport, and the provision of accessible transport services.</p>	<p>The Transport Access Program is identified in the Strategy as an example of the NSW Government working to improve accessibility of the rail network. As identified in the Strategy, the delivery and modernisation of infrastructure will allow greater access for people with disabilities and those with limited mobility.</p> <p>The Proposal would assist in meeting the following State-wide outcomes detailed in <i>Future Transport 2056</i>:</p> <ul style="list-style-type: none"> <li>encouraging active travel (walking and cycling) and using public transport</li> <li>a fully accessible network that enables barrier-free travel for all.</li> </ul>
<b><i>Disability Inclusion Action Plan 2018-2022</i></b> (TfNSW, 2017a)	<p>The <i>Disability Inclusion Action Plan 2018-2022</i> (TfNSW, 2017a) was developed by TfNSW in parallel with the development of Future Transport 2056. The Plan builds on the objectives of Future Transport 2056 in relation to accessibility to transport.</p>	<p>The Transport Access Program has been identified in this Plan as a key action to ensure transport networks in Sydney are accessible for all potential users.</p>



Policy/ Strategy	Overview	How the Proposal aligns
<p><b><i>A Metropolis of Three Cities - Greater Sydney Region Plan</i></b> (Greater Sydney Commission, 2018)</p>	<p>The <i>Greater Sydney Region Plan</i> is the NSW Government's 40-year land use plan for Sydney. It establishes a vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City.</p>	<p>The Proposal would enable equitable access to services and employment as well as social and cultural opportunities through investment in transport. The proposed upgraded streets and infrastructure would promote public transport movements, walking, cycling and social opportunity, which contribute to the character and identity of the area.</p>
<p><b><i>Western City District Plan</i></b> (Greater Sydney Commission, 2018)</p>	<p>The Western City District Plan is a 20-year plan to manage growth in the context of economic, social and environmental matters to achieve the 40-year vision for Greater Sydney. It helps guide the implementation of Greater Sydney Region Plan, A Metropolis of Three Cities, at a district level and is a bridge between regional and local planning.</p>	<p>The Proposal would assist in meeting the Planning Priorities W3 “providing services and social infrastructure to meet people’s changing needs” and W7 “Establishing the land use and transport structure to deliver a liveable, productive and sustainable western parkland city”, as it would provide an accessible train station allowing people of all mobility levels to easily access transport services.</p>
<p><b><i>Building Momentum – State Infrastructure Strategy 2018-2038</i></b> (Infrastructure NSW, 2018)</p>	<p>The <i>State Infrastructure Strategy 2018-2038</i> makes recommendations for each of NSW’s key infrastructure sectors including transport.</p>	<p>The Proposal would upgrade public transport services to provide access for a wider range of customers. It would also involve the upgrade of existing infrastructure which aligns with an objective of the strategy to optimise the use of the State’s existing assets.</p>
<p><b><i>NSW Government key policy priorities</i></b> (NSW Government, 2020)</p>	<p>The NSW Government has identified the following key policy priorities:</p> <ul style="list-style-type: none"> <li>• A strong economy</li> <li>• Highest quality education</li> <li>• Well connected communities with quality local environments</li> <li>• Putting customers at the centre of everything we do</li> <li>• Breaking the cycle of disadvantage</li> </ul>	<p>The Proposal would assist in meeting the priorities to develop well connected communities with quality local environments and putting customers at the centre of everything we do by improving accessibility to, and encouraging greater usage of, public transport.</p>
<p><b><i>2016 – 2026 Fairfield City Plan-Community Strategic Plan</i></b> (Fairfield Council, 2019)</p>	<p>The 2016-2026 Community Strategic Plan for the Council is a detailed 10 year plan prepared by the Council through a series of community consultations and identifies the community’s vision, goals and strategies for the future. The Strategic Plan has identified a need for Improved access at railway stations for the elderly and people with a disability.</p>	<p>The Proposal would assist in meeting goals outlined in the 2016-2026 Fairfield City Plan by creating accessible public transport at Canley Vale Station to the elderly and less mobile. Improving the accessibility to Canley Vale Station would enable a wider range of the community to utilise transport services.</p>

Policy/ Strategy	Overview	How the Proposal aligns
<p><b>Disability Inclusion Action Plan 2017 – Fairfield City Council</b> (Fairfield Council, 2019)</p>	<p>Fairfield City Council’s Disability Inclusion Action Plan provides comprehensive details of how the Council aims for the city to evolve into an inclusive and accessible place for everyone.</p>	<p>The Proposal would assist in meeting a priority of the Plan, and that is to provide lifts at the Canley Vale Railway Station, which would create a more liveable community.</p>

## 2.2 Objectives of the Proposal

Canley Vale Station has been identified for an accessibility upgrade as it does not currently meet key requirements of the DSAPT or the DDA. The objectives of the Proposal have been prepared with consideration of the overarching objectives of the Transport Access Program (refer to Section 1.1.1).

The Proposal would provide safe and equitable access to the platforms and to the pedestrian network surrounding the station. The specific objectives of the Canley Vale Station Upgrade are to:

- provide a station that is accessible to people with a disability, limited mobility, parents/carers with prams and customers with luggage
- improve overall customer experience by improving accessibility for those with mobility issues (including increased access to station facilities such as the toilets, and accessible parking spaces)
- reduce potential pedestrian conflict and crowding points
- improve integration with surrounding precinct
- improve customer safety
- improve wayfinding in and around the station
- improve customer amenity.

## 2.3 Design development

The need for an upgrade was identified as the existing station layout does not meet the requirements of the DSAPT or the DDA. It does not allow for equitable access to the station platforms. The following issues were identified:

- lack of an accessible path of travel between the two platforms
- platform accessible paths to Boarding Assistance Zones (BAZ) and amenities are non-compliant in some areas
- handrails on stairs to the existing footbridge are not continuous
- rest points along accessible path are non-compliant
- lack of accessible car parking within close proximity to the station
- lack of kiss and ride facilities along First Avenue
- lack of accessible facilities at the station - including family accessible toilet and ambulant toilets.

The needs and opportunities at Canley Vale Station were then considered in the development of options for the scoping design. The selected preferred option would then be further defined during detailed design and subject to approval.

## **2.4 Options considered**

Three scoping design options were developed following a series of workshops to address accessibility and customer experience needs. The three design options were assessed using TfNSW's Multi-Criteria Analysis (MCA) framework. The process considered a range of factors such as customer experience, accessibility, engineering constraints, modal integration and cost in order to select a preferred option.

The three design options had a number of similar elements including the installation of new lifts, new accessible parking space and a kiss and ride space, refurbishment of the existing platform building to accommodate a family accessible toilet, new ambulant toilets, ancillary work such as utility relocations and improvements to wayfinding signage.

The key difference between the options involved the footbridge. Option 1 would modify the existing footbridge to include two lifts. Options 2 and 3 included a new footbridge constructed north of the current footbridge location (Option 2) or centrally located on the platforms (Option 3). Options 2 and 3 would both increase the duration of construction, and would have greater engineering constraints compared to Option 1.

A 'do-nothing' option was not considered as a feasible alternative as it would not meet the requirements of the DDA and DSAPT. A 'do-nothing' option would not assist in encouraging the use of public transport or meet the current and future needs of the Canley Vale community.

## **2.5 Preferred option**

The design options for Canley Vale Station Upgrade were reviewed and discussed through a series of workshops. The refined option was developed based on the TAP 3 scope objectives, along with consultation from BCA/DDA specialists, TfNSW and relevant stakeholders. The options development process resulted in an updated and refined version of Option 1 as the preferred option.

As outlined in Section 2.4, Option 1 was considered to be the preferred option as it achieves accessibility compliance and improves access across the rail corridor. Option 1 proposes minimal change to the current configuration of Canley Vale Station with fewer engineering constraints, a shorter construction duration and less impact to the community.

## 3 Proposal description

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### 3.1 The Proposal

The Proposal involves an upgrade of Canley Vale Station as part of TAP which aims to improve accessibility and amenity for customers. The description of the Proposal below is based on a concept design and is subject to detailed design.

#### 3.1.1 Scope of works

##### New lifts to existing footbridge

- construction and installation of two lifts connecting to the existing footbridge. This would include:
  - installation of a three stop lift on the Railway Parade (western) side of station, connecting street level, Platform 1 and the footbridge
  - installation of a lift on the First Avenue (eastern) side of station, connecting Platform 2 to the footbridge
  - lift lobbies with canopies and anti-throw screens
- extension of the existing footbridge at both ends to connect to the new lift lobbies
- minor modifications to the existing footbridge including installation of continuous handrails on both sides of the footbridge and stairs to platforms.

##### Station entrances and interchange facilities

- upgrade of the station entry stairs from Railway Parade to Platform 1; the stairs would be widened to 3 metres to improve customer flow
- widening of footpath and upgrade of pedestrian safety fence on Railway Parade
- provision of an accessible kiss and ride bay on First Avenue including line marking, signage, new kerb ramp and kerb adjustments
- provision of one new accessible parking space on First Avenue including line marking, signage, and kerb adjustments
- upgrade of accessible paths from the station entry to the new accessible kiss and ride bay and new accessible parking on First Avenue.

##### Platform and platform building work

- internal station building work including:
  - reconfiguration of the existing male toilets to provide one new unisex family accessible toilet, including level access from platform 1 and a new wide door for wheelchair access to the new toilet
  - reconfiguration of the existing female toilets to provide one new female ambulant toilet and one new male ambulant toilet
- localised platform regrading to allow for accessible paths of travel
- installation of new Tactile Ground Surface Indicators (TGSIs) to the platform and stairways, including new direction TGSIs on platforms

##### Ancillary work

- provision of two new Opal card readers at platform lift entries

- provision of wayfinding signage within the station and interchange precinct
- provision of anti-graffiti coating to all new and modified hard surfaces
- relocation of any existing station platform furniture including but not limited to seats, Opal card readers, rubbish bins, boarding ramp cabinets, and lighting
- improvements to existing station systems (including installing additional CCTV cameras as required, installing new LED lighting, and provision of new Public Address (PA) system speakers as required)
- provision of hearing loops at the station
- removal of the bin storage area on Railway Parade and provision of a consolidated bin storage area on First Avenue
- temporary site compounds for storage of material and equipment
- temporary work (where required) during construction to maintain access to the station
- relocation of services and utilities to accommodate the proposed infrastructure including; underground High Voltage (HV) services, train signals and communications services on the First Avenue side of the station, and traffic lights and storm water along Railway Parade
- overhead HV services relocation including the removal of a HV power pole. The new HV route will be determined during detailed design to accommodate the new lift structures.
- station electrical supply upgrade work including any distribution boards as required to accommodate the power requirements for the Proposal.

### **3.1.2 Materials and finishes**

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

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

- lift shaft – painted concrete, steel, aluminium louvres and lift panels, clear glass, steel roof sheeting
- lift lobby weather protection canopies – steel
- footbridge extensions – precast concrete
- access paths – concrete or asphalt paths
- access stairs – concrete stairs, with steel handrails and non-slip tread.
- balustrades and protection screens – powder coated aluminium
- toilets – high gloss ceramic wall tiles, dark grey slip resistant floor tiles.

Indicative photomontages of the Proposal are in Section 6.2.2.

## 3.2 Design development

### 3.2.1 Engineering and environmental constraints

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

**Existing structures:** the placement and integrity of existing structures including the existing platform, footbridge, footpaths, stairs, car park, pedestrian crossings, station building, overhead wiring and associated support structures.

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

**Vegetation:** Planted vegetation and mature landscape trees that boarder Canley Vale Station will be retained along Railway Parade and First Avenue.

**Construction access:** Construction access would require traffic control in the adjacent streets and use of a large mobile crane would be required to lift construction materials and equipment to the station from these roadways on specified days. There are scheduled rail possession periods that can be utilised to minimise impact on commuters.

**Public access:** Customer access to the station would be maintained throughout the construction work. When required, footbridge closures to allow construction would take place during scheduled rail possessions.

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

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

### 3.2.2 Design standards

The Proposal would be designed in line with the following design standards:

- *Disability Standards for Accessible Public Transport (DSAPT) 2002* (issued under the Commonwealth *Disability Discrimination Act (DDA) 1992*)
- National Construction Code
- TfNSW Asset Standards Authority standards
- Sydney Trains standards
- *TfNSW Urban Design Guidelines*

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

### **3.2.3 Sustainability in design**

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

The proposed Canley Vale Station Upgrade is one of a number of projects within the Transport Access Program that is using version 1.2 of the IS rating tool and targeting an 'Excellent' rating.

The IS Rating Scheme is grouped into six key themes:

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

These sustainability themes are divided into 15 performance categories, against which the Proposal would be independently assessed and assigned a rating level. The Proposal would need to achieve between 50 and 74 points out of a possible 100 to be certified as 'Excellent' under IS version 1.2.

## **3.3 Construction activities**

### **3.3.1 Work methodology**

Subject to approval, construction is expected to commence in early 2021 and take around 18 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Construction Contractor in consultation with TfNSW.

The proposed construction activities for the Proposal are identified in Table 2. This staging is indicative and is based on the current concept design and may change once the detailed design is finalised.

**Table 2 Indicative construction staging for key activities**

Stage	Activities
Site establishment and enabling work	<ul style="list-style-type: none"> <li>• establish site compound/s (erect fencing, tree protection zones, site offices, amenities and plant/material storage areas etc.)</li> <li>• establishment of temporary facilities as required (e.g. construction access, construction lighting, temporary toilets)</li> <li>• erect site hoarding / fencing as required</li> <li>• relocate or upgrade services / utilities where required</li> </ul>
Lifts	<ul style="list-style-type: none"> <li>• excavate for lift pits and foundations</li> <li>• waterproof (as required), install reinforcement, formwork and concrete to form the lift pits</li> <li>• erect lift shaft structure and lift landings</li> <li>• install protection screens and external finishes</li> <li>• install lift shaft services, lift cars and fit out lift cars</li> <li>• install lighting / CCTV / PA services to lift landings</li> </ul>
Footpath widening	<ul style="list-style-type: none"> <li>• implement traffic controls</li> <li>• close part of lane closest to the station entry on Railway Parade</li> <li>• relocate traffic signals at intersection of Railway Parade and Canley Vale road</li> <li>• install reinforcement and formwork and form new kerb alignment and footpath on Railway Parade at the station entry</li> </ul>
Footbridge and stair upgrade	<ul style="list-style-type: none"> <li>• build footbridge extension at both ends to connect with the new lift landings</li> <li>• demolish existing non-compliant stair handrails (where required)</li> <li>• modify stairs and footbridge including installation of new stair nosings, continuous handrails and TGSIs.</li> <li>• widen entry stairs that lead from Railway Parade to Platform 1</li> </ul>
Platform modification work	<ul style="list-style-type: none"> <li>• extend platforms to new lift entries</li> <li>• regrade platform surfaces as required for accessible path</li> <li>• relocate platform furniture along accessible paths (where required)</li> <li>• install new yellow line and TGSIs along platforms</li> <li>• install new Opal card readers at lift lobbies on platforms</li> </ul>
Station building work	<ul style="list-style-type: none"> <li>• install new family accessible toilet and ambulant toilets in place of existing toilet facilities</li> <li>• upgrade the general station infrastructure including DDA signage, CCTV etc. where applicable</li> </ul>
Car park upgrades	<ul style="list-style-type: none"> <li>• reconfigure the existing roadway (kerb, line marking, etc.) to accommodate the upgraded accessible parking and new kiss and ride bays</li> <li>• install new kerb ramps</li> </ul>



Stage	Activities
Demobilisation	<ul style="list-style-type: none"> <li>• install other ancillary features and landscaping</li> <li>• remove hoardings</li> <li>• clear site</li> <li>• remove environmental, safety and traffic controls</li> </ul>

### 3.3.2 Plant and equipment

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

- trucks
- jack hammer
- chainsaw
- piling rig
- franna/mobile cranes
- bobcat
- excavator
- demolition saw
- concrete pump and truck
- lighting towers
- concrete coring machine and vibrators
- water cart
- vacuum truck
- elevated work platforms (EWP)
- forklift
- hi-rail plant (EWP/ flatbed/hiab/dump trucks)
- vibrating roller/compaction plate
- road rail excavator
- hand tools
- skip trucks
- hammer drills
- torque wrenches
- welders and oxyacetylene gas cutters
- grinders and bar benders

### 3.3.3 Working hours

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

- 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.

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

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

- site survey and services location investigations within and around the rail corridor
- relocation of HV aerial services
- excavation and installation of lift shafts and lobby structures and connection to footbridge
- regrading of platform surface and installation of TGSI's
- station service relocations.

Out of hours work may also be scheduled outside of rail possessions. Approval from TfNSW would be required for any out of hours work and the affected community would be notified as outlined in the TfNSW *Construction Noise and Vibration Strategy* (TfNSW, 2018b). Refer to Section 6.3 for further details.

The Minister for Planning and Public Spaces has recently made a number of Orders under Section 10.17 of the Environmental Planning and Assessment Act 1979 (EP&A Act) in response to the COVID-19 pandemic. This includes the Environmental Planning and Assessment (COVID-19 Development – Infrastructure Construction Work Days) Order 2020 (the 'Order'), which applies to construction activities for projects which have been subject to a completed assessment under Division 5.1, or approval under Division 5.2 of the EP&A Act.

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

At the time of finalising this Review of Environmental Factors for the Proposal, the Order had not been issued. As such, TfNSW will consider its position with regard to extending standard construction hours consistent with the intention of the Order through the Determination process. In the event that TfNSW would seek to extend the standard construction hours, the potential environmental impacts of doing so would be further assessed as part of the Determination Process.

### **3.3.4 Earthworks**

There would be no excavations or earthwork, only demolition and minor footings required for the following:

- construction of both new lift pits and foundations
- minor construction of foundations for platform extensions to lift entries
- regrading of accessible path on platforms and to new accessible car space and kiss and ride bay
- other minor civil works including footings and foundations for structures, drainage / stormwater work, and trenching activities for service adjustments and relocations.

It is estimated that approximately 80 cubic metres of excavated material would be generated from the above activities. Excavated material would be re-used on site where possible or disposed of in accordance with relevant legislative requirements.

### **3.3.5 Source and quantity of materials**

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

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

### **3.3.6 Traffic access and vehicle movements**

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

- temporary increase in walking distance for rail customers on the station platform during construction work due to placement of construction hoarding and work sites
- higher road safety risk levels associated with construction vehicle-pedestrian interactions
- potential increased congestion and travel time on Railway Parade and Canley Vale Road due to footpath and traffic signal modification work
- potential increased congestion and travel time on First Avenue due to temporary lane closures during the lift installations and traffic control for construction vehicle site access
- reduced parking spaces due to partial closure of the First Avenue commuter car park and on street parking during upgrade work to the accessible parking space and kiss and ride bay
- minor disruptions to pedestrian/cyclist movements in and around the station
- minor increase in traffic on the local road network.

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

### **3.3.7 Ancillary facilities**

Temporary construction compounds would be required to accommodate a site office, amenities, laydown and storage area for materials. A number of areas for the construction compound and staging areas have been proposed on the east, west and south side of Canley Vale Station. Public parking spaces would be temporarily affected by the establishment of the compound sites and delivery of temporary site sheds.

Figure 8 shows Canley Vale Station, primary compound area and material storage, as well as a secondary compound/material and equipment storage area. The construction compound sites would be located on land owned by RailCorp. Impacts associated with utilising this area have been considered in Chapter 6 of this REF, including requirements for rehabilitation.



**Figure 8: Location of compound and storage areas**

### **3.3.8 Service relocation and adjustments**

It is anticipated that some services would require relocation or upgrade in association with the Proposal, including modifications to aerial high voltage routes, underground services including stormwater and communications within the project footprint. Further consideration, consultation and environmental assessment would be undertaken as necessary during detailed design.

## **3.4 Property acquisition**

TfNSW does not propose to acquire any property as part of the Proposal. Work would be undertaken entirely within the rail corridor (including the construction compound area on land owned by RailCorp) and land owned by Fairfield City Council. Temporary occupation of council land would be required to facilitate construction and this land would be reinstated upon completion.

## **3.5 Operation and maintenance**

The future operation and maintenance of the upgraded station is subject to further discussions with Sydney Trains, TfNSW and Fairfield City Council. However, the Proposal is not anticipated to significantly alter the current operating arrangements.

Structures constructed under this Proposal would be maintained by Sydney Trains. It is expected that adjacent footpaths would continue to be maintained by Fairfield City Council.

## 4 Statutory considerations

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### 4.1 Commonwealth legislation

#### 4.1.1 Environment Protection and Biodiversity Conservation Act 1999

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

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

### 4.2 NSW legislation and regulations

#### 4.2.1 Transport Administration Act 1988

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

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

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

#### 4.2.2 Environmental Planning and Assessment Act 1979

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

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

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

### 4.2.3 Other NSW legislation and regulations

Table 3 provides a list of other relevant legislation applicable to the Proposal.

**Table 3 Other NSW legislation applicable to the Proposal**

Applicable legislation	Considerations
<i>Biodiversity Conservation Act 2016</i> (BC Act)	<p>The BC Act establishes a framework for assessing and protecting environmental and public interests.</p> <p>The site does not contain suitable habitat for any listed threatened species or community and is unlikely to have a significant impact on any threatened species or community (refer Section 6.7).</p>
<i>Biosecurity Act 2015</i>	<p>Clause 22 requires any person who deals with a biosecurity matter has a duty to ensure that in so far as is reasonably practicable, the potential biosecurity risk is prevented, eliminated or minimised. Appropriate management methods would be implemented during construction if declared noxious weeds in the Fairfield City LGA are identified (refer to Section 6.6).</p>
<i>Contaminated Land Management Act 1997</i> (CLM Act)	<p>Section 60 of the CLM Act imposes a duty on landowners to notify the Office of Environment and Heritage (OEH), and potentially investigate and remediate land if contamination is above EPA guideline levels.</p> <p>The site has not been declared under the CLM Act as being significantly contaminated (refer Section 6.8).</p>
<i>Heritage Act 1977</i> (Heritage Act)	<p>Sections 57 and 60 (approval) where items listed on the State Heritage Register are to be impacted</p> <p>Sections 139 and 140 (permit) where relics are likely to be exposed</p> <p>Section 170 where items listed on a government agency Heritage and Conservation Register are to be impacted.</p> <p>Canley Vale Station is not listed on any Heritage Registers</p>
<i>National Parks and Wildlife Act 1974</i> (NPW Act)	<p>Sections 86, 87 and 90 of the NPW Act require consent from OEH for the destruction or damage of Aboriginal objects. The Proposal is unlikely to disturb any Aboriginal objects (refer Section 6.4).</p> <p>However, if unexpected archaeological items or items of Aboriginal heritage significance are discovered during the construction of the Proposal, all works would cease, and appropriate advice sought as per the <i>TfNSW Unexpected Heritage Finds Guideline</i> (TfNSW, 2019b).</p>
<i>Protection of the Environment Operations Act 1997</i> (PoEO Act)	<p>The Proposal does not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal.</p> <p>However, in accordance with Part 5.7 of the PoEO Act, TfNSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Construction Contractor.</p>

Applicable legislation	Considerations
<i>Roads Act 1993</i> (Roads Act)	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads. The Proposal would involve works on First Avenue which is a local road under the control of Fairfield City Council. Road Occupancy Licence/s would be obtained from the relevant roads authority for road works and any temporary road closures where required (see Section 6.1 for more information).
<i>Sydney Water Act 1994</i>	The Proposal would not involve discharge of wastewater to the sewer.
<i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act)	TfNSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared.

#### 4.2.4 Key State Environmental Planning Policies

##### State Environmental Planning Policy (Infrastructure) 2007

*State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) is the key environmental planning instrument which determines the permissibility of a proposal and under which part of the EP&A Act an activity or development may be assessed.

The Infrastructure SEPP prevails over all other environmental planning instruments except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018*.

Clause 79 of the Infrastructure SEPP allows for the development of ‘rail infrastructure facilities’ by or on behalf of a public authority without consent on any land (i.e. assessable under Division 5.1 of the EP&A Act). Clause 78 defines ‘rail infrastructure facilities’ as including elements such as ‘railway stations, 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’.

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

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

It is noted the Infrastructure SEPP prevails over all other environmental planning instruments except where *State Environmental Planning Policy (State Significant Precincts) 2005* and *State Environmental Planning Policy (Coastal Management) 2018 – Clause 10* applies. The Proposal does not require consideration under the *State Environmental Planning Policy (Major Development) 2005*. With regard to the *State Environmental Planning Policy (Coastal Management) 2018*, the Proposal is located within a mapped ‘coastal proximity area’. Further consideration of this SEPP is provided below.

## **State Environmental Planning Policy 55 – Remediation of Land**

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

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

## **State Environmental Planning Policy (Coastal Management) 2018**

*State Environmental Planning Policy (Coastal Management) 2018* (Coastal Management SEPP) updates and consolidates SEPP 14 (Coastal Wetlands), SEPP 26 (Littoral Rainforest) and SEPP 71 (Coastal Protection), including clause 5.5 of the Standard Instrument – Principal Local Environmental Plan. These policies are now repealed.

The Coastal Management SEPP gives effect to the objectives of the *Coastal Management Act 2016* from a land use planning perspective, by specifying how development Proposals are to be assessed if they fall within the coastal zone. The coastal zone is comprised of four coastal management areas:

- Coastal wetlands and littoral rainforest area
- Coastal vulnerability area
- Coastal environment area
- Coastal use area.

Though not located on the NSW coast, an area approximately 80m north west of Canley Vale Station displays the characteristics of coastal wetlands. As such, Canley Vale Station is located on land mapped as proximity area for coastal wetlands, which is within 'Coastal Wetlands and littoral rainforest area', under Clause 11 (1) of the Coastal Management SEPP. Since the Proposal is assessed under the Infrastructure SEPP, (Clause 79) Development permitted without consent, then the proposal presents no inconsistency, and prevails over the Coastal Management SEPP.

If the Proposal was located within an area mapped as Coastal Wetlands or Littoral Rainforest, the Coastal Management SEPP would require that the public authority obtain development consent from the relevant local council.

Under the provision of the Infrastructure SEPP, the proposal does not require development consent (refer to section 4.2.4). Notwithstanding, the Proposal is not considered likely to have an impact on coastal proximity values.

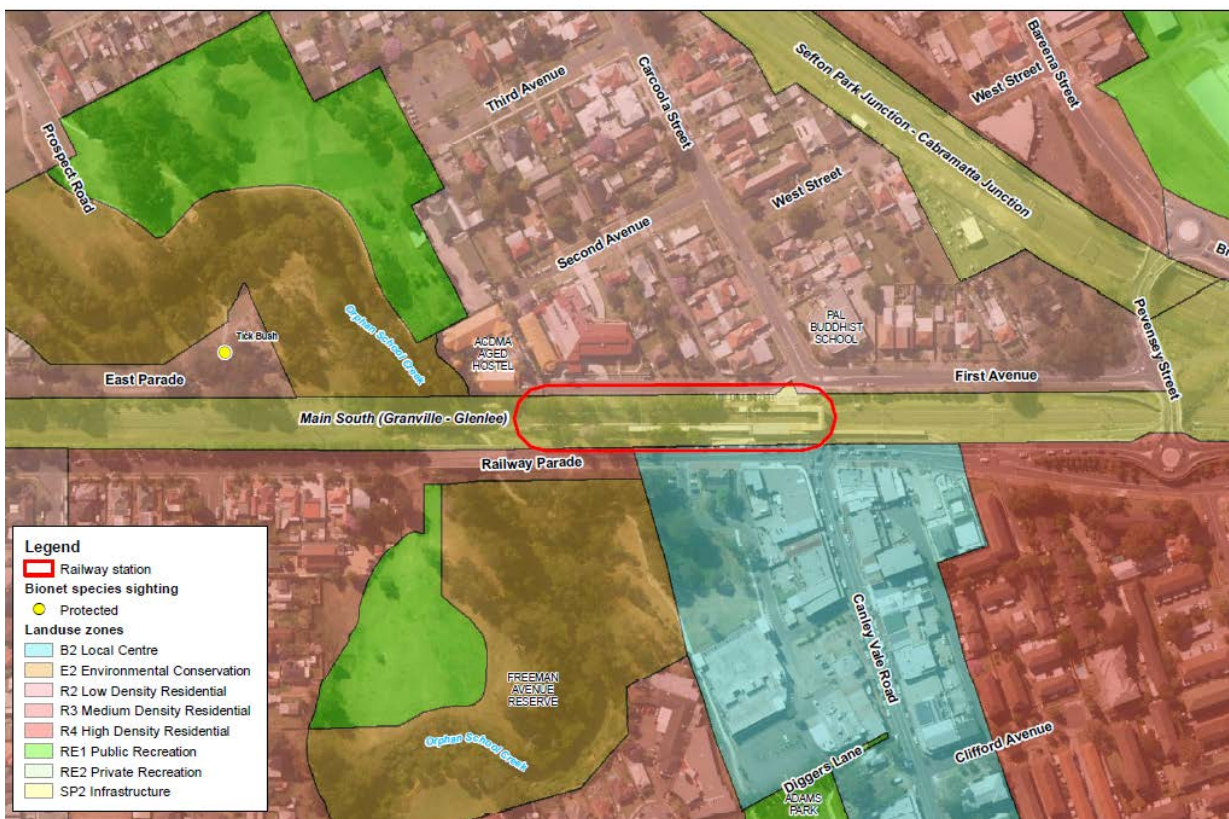
### **4.2.5 Fairfield Local Environmental Plan 2013**

The Proposal is located with the Fairfield City Council LGA and while the Infrastructure SEPP is the prevailing environmental planning instrument, the provisions of the *Fairfield Local Environmental Plan 2013* have been considered for the Proposal in Table 4. Land use zonings are displayed in Figure 9.



**Table 4 Relevant provisions of the Fairfield LEP**

Provision description	Relevance to the Proposal
<p>Clause 2.3 Zone objectives and Land Use Table</p> <p>SP2 Infrastructure (rail corridor)</p>	<p>The rail related infrastructure of Canley Vale Station is zoned Special Purposes 2 –infrastructure. The station is surrounded by B2 – local centre areas, R4 – high density residential, R3 – medium density residential, E2 – environmental conservation and RE1 – public recreation. The land use objectives within the SP2 zone include:</p> <ul style="list-style-type: none"> <li>to provide for infrastructure and related uses</li> <li>to prevent development that is not compatible with or that may detract from the provision of infrastructure.</li> </ul>
<p>Clause 6.2 Earthwork</p>	<p>The objective of this clause is to ensure that earthwork 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. By virtue of clause 5(3) and 79 of the Infrastructure SEPP, the Proposal is permissible without development consent. Consideration of the potential impacts and mitigation measures for earthwork for the Proposal is outlined in Section 6.8.</p>



**Figure 9 Fairfield LEP zoning map (WSP, 2013)**

### 4.3 Ecologically sustainable development

TfNSW is committed to ensuring that its projects are implemented in a manner that is consistent with the principles of ecologically sustainable development (ESD). The principles of

ESD are generally defined under the provisions of clause 7(4) of Schedule 2 to the EP&A Regulation as:

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

The principles of ESD have been adopted by TfNSW throughout the development and assessment of the Canley Vale Station Upgrade. Section 6.12 includes an assessment of the Proposal on sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

## 5 Community and stakeholder consultation

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

### 5.1 Stakeholder consultation during concept design

As part of the design development for the Proposal, meetings and workshops were held to ensure that key stakeholders were involved in the collaborative design process. Key stakeholders for the Proposal include:

- TfNSW
- Sydney Trains
- Fairfield City Council

### 5.2 Consultation requirements under the Infrastructure SEPP

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

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

**Table 5 Infrastructure SEPP consultation requirements**

Clause	Clause particulars	Relevance to the Proposal
<b>Clause 13   Consultation with Councils – development with impacts on council related infrastructure and services</b>	<p>Consultation is required where the Proposal would result in:</p> <ul style="list-style-type: none"> <li>– substantial impact on stormwater management services</li> <li>– generating traffic that would place a local road system under strain</li> <li>– involve connection to or impact on a council owned sewerage system</li> <li>– involve connection to and substantial use of council owned water supply</li> <li>– significantly disrupt pedestrian or vehicle movement involve significant excavation to a road surface or footpath for which Council has responsibility.</li> </ul>	<p>The Proposal includes work that would:</p> <ul style="list-style-type: none"> <li>– require connections or impacts the stormwater system</li> <li>– temporarily disrupt pedestrian and vehicle movements</li> <li>– impact on road pavements under Council's care and control</li> <li>– impact on Council-operated footpaths.</li> <li>– consultation with Fairfield City Council has commenced and would continue throughout the detailed design and construction phases.</li> </ul>
<b>Clause 14   Consultation with Councils – development with</b>	<p>Where railway station work would:</p> <ul style="list-style-type: none"> <li>– substantially impact on local heritage item (if not also a State heritage item)</li> </ul>	<p>There is no proposed impact to local heritage or a heritage conservation area. Accordingly, consultation with Council is not required. Refer to Section 6.5.</p>

Clause	Clause particulars	Relevance to the Proposal
impacts on local heritage	<ul style="list-style-type: none"> <li>substantially impact on a heritage conservation area.</li> </ul>	
<b>Clause 15   Consultation with Councils – development with impacts on flood liable land</b>	<p>Where railway station work would:</p> <ul style="list-style-type: none"> <li>impact on land that is susceptible to flooding – reference would be made to <i>Floodplain Development Manual: the management of flood liable land</i>.</li> </ul>	The Proposal is located on land that is susceptible to flooding. Accordingly, consultation with Council is required in regard to this aspect. Refer to Section 6.9.
<b>Clause 15A   Consultation with Councils – development with impacts on certain land within the coastal zone</b>	<p>Where railway station work would:</p> <ul style="list-style-type: none"> <li>impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land.</li> </ul>	The Proposal is located on land mapped as 'Proximity Area for Coastal Wetlands'. Work would be undertaken under ISEPP Clause 79, however, consultation with Council would be required in regards to this aspect, and any response would be taken into consideration if received within the required period.
<b>Clause 15AA   Consultation with State Emergency Service – development with impacts on flood liable land</b>	<p>Where railway station work would:</p> <ul style="list-style-type: none"> <li>impact on flood liable land – written notice must be given (together with a scope of work) to the State Emergency Service. Any response to the notice received from the State Emergency Service within 21 days after the notice is given must be taken into consideration.</li> </ul>	The Proposal is located on land that is susceptible to flooding. Accordingly, notification to the State Emergency Service is required in regard to this aspect, and any response would be taken into consideration if received within the required period.
<b>Clause 16   Consultation with public authorities other than Councils</b>	<p>For specified development which:</p> <ul style="list-style-type: none"> <li>includes development that is undertaken adjacent to land reserved under the National Parks and Wildlife Act 1974, consultation with the DPIE Energy, Environment and Science Group is required. Consultation with other agencies is required when specified by the Infrastructure SEPP.</li> </ul>	The Proposal is not located adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i> . Accordingly, consultation with the DPIE Energy, Environment and Science Group on this matter is not required.

### 5.3 Consultation strategy

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

The objectives of the consultation strategy are to:

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

### 5.3.1 Public display

Transport for NSW supports the Government's response to Coronavirus and continues to work closely with NSW Health and other government agencies, as well as external operators state-wide to ensure the safety of customers and help prevent the spread of Coronavirus.

As transport is an essential service, the delivery of our vital infrastructure programs are continuing while ensuring the safety of our staff, customers and the community.

An important part of this is engaging with the local community so we can better understand their needs and deliver improved customer and community outcomes. Given the current circumstances, community consultation during the preparation of the REF adopted a range of online and non-face-to-face consultation mechanisms, including:

- public display of the REF online
- targeted consultation with local businesses, schools, Aboriginal groups and other community groups through phone calls, emails and online briefings
- distribution of a community notification to both the local community via letterbox drop and rail customers at the station to inform the community about the Proposal
- installation of project signage at the station and in the existing commuter car parks
- consultation with key stakeholders such as Fairfield City Council and Sydney Trains
- geographically targeted social media advertising via Facebook to inform locals of the proposal and invite their feedback online
- development of a dedicated web page for the project on the Transport for NSW website which can be found at [www.transport.nsw.gov.au/canleyvale](http://www.transport.nsw.gov.au/canleyvale)

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

The REF would be placed on public display on the TfNSW website and the NSW Government Have Your Say website.

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

**During the display period, feedback can be sent:**

- to [projects@transport.nsw.gov.au](mailto:projects@transport.nsw.gov.au)
- through the TfNSW website [www.transport.nsw.gov.au/canleyvale/](http://www.transport.nsw.gov.au/canleyvale/)

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

## **5.4 Ongoing consultation**

All feedback received by Transport for NSW will be considered and responded to in a Determination Report, which will be made publicly available. All community members who provide feedback will receive acknowledgement from Transport for NSW that their feedback has been received. They will also be contacted when the Determination Report is available on the Transport for NSW website.

Please note Transport for NSW ensures all private information received from the community remains confidential.

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

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

## 6 Environmental impact assessment

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

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

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

### 6.1 Traffic and transport

A Traffic, Transport and Access Impact Assessment was prepared for the Proposal (*Traffic, Transport and Access Impact Assessment*, WSP, 2018). The assessment included a desktop analysis and site inspection. Detailed traffic counts and modelling were not considered necessary as the Proposal is focused on the station area and is unlikely to have major impacts on the surrounding road network. The findings of the assessment are summarised in this section.

#### 6.1.1 Existing environment

Canley Vale Station is serviced by the T2 Inner West and Leppington Line which operates between the City and Leppington and the T5 Cumberland Line which operates between Richmond and Leppington via Parramatta and Liverpool.

The Bureau of Transport Statistics (NSW BTS) reveals Canley Vale Station is the 94th busiest railway station on the Sydney Trains network, with approximately 4,860 passenger trips (combined entry and exit) recorded at the station on an average weekday.

The station has two side platforms which are accessed via a footbridge, stairs, and ramps which also provide local connections from First Avenue on the East, to Railway Parade on the West. On the Eastern and Western sides of the station, the two side platforms are accessed through a newly constructed ramp and stairs. The two platforms are connected by a footbridge at the Southern end of the station

Canley Vale Station is currently not compliant with DSAPT and other elements of the station are below current standards.

## Road network

Canley Vale Station is surrounded by Railway Parade and Canley Vale Road to the west and First Avenue and Carcoola Street to the east (refer Figure 10).

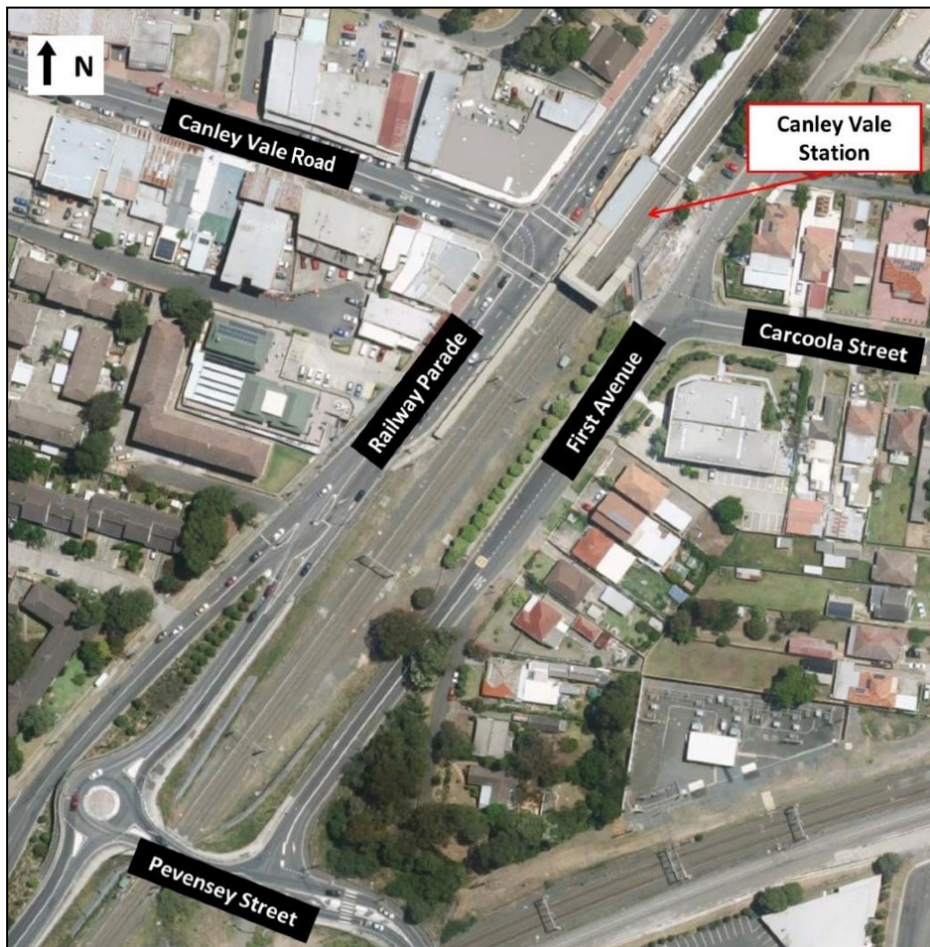


Figure 10 Road network adjacent to Canley Vale Station (WSP, 2018)

### *Railway Parade*

Railway Parade is a Regional road with a mixture of single and dual lane configuration in either direction adjacent to the railway station with a signalised intersection with Canley Vale Road. It has a posted speed limit of 50 km/h.

### *Canley Vale Road*

Canley Vale Road is a Regional road which is two-lane two-way with on-street parking lanes on both sides of the road. It is the main street through the local Canley Vale Town Centre and has a posted speed limit of 50 km/h. A 40 km/h school zone is located towards Sackville Street.

### *First Avenue*

First Avenue is a Local road which is two-lane two-way with commuter car parking provided on both sides of the road. It has a posted speed limit of 50 km/h with a 40 km/h school zone during school pick-up and drop-off periods. First Avenue is left turn only at Pevensey Street.



### *Carcoola Street*

Carcoola Street is a Local road which is two-lane two-way with on-street parking on both sides of the road. It has a posted speed limit of 50 km/h. A 40 km/h school zone is located towards First Avenue.

### *Pevensey Street*

Pevensey Street (Bareena Street) is a Regional road that connects Railway Parade and Bareena Street and crosses the railway line via overbridge. It has a posted speed limit of 50 km/h.

## **Parking facilities**

There is no accessible parking currently available at Canley Vale Station.

85 commuter car park spaces are available within the vicinity of the Station, comprising 51 car spaces located on First Avenue and 35 on street all day parking spaces in First Ave and Carcoola Street. A commuter car park is located on the northern side of Fornasier Lane approximately 150 m from Canley Vale station. The multi-level car park comprising 184 car spaces in a split level arrangement. A total of 97 parking spaces are dedicated for use by commuters.

## **Taxi and kiss and ride**

Canley Vale station is serviced by a taxi zone which is combined with the bus zone located on the eastern side of Railway Parade, south of Canley Vale Road and accommodates approximately two taxis.

Currently, there are no formal kiss-and-ride facilities at Canley Vale Station, however the bus zone on the eastern side of Railway Parade is used as an informal pick up and drop off area.

## **Bus Services**

There are three bus stops located at or adjacent to the station including:

- eastern side of Railway Parade, south of Canley Vale Road
- western side of Railway Parade, north of Canley Vale Road
- southern side of Canley Vale Road, approximately 80 m west of Railway Parade.

Two bus services operate from these stops:

- Route 817 – Cabramatta to Fairfield
- Route N50 – Liverpool to Sydney CBD, Limited service that operates at night.

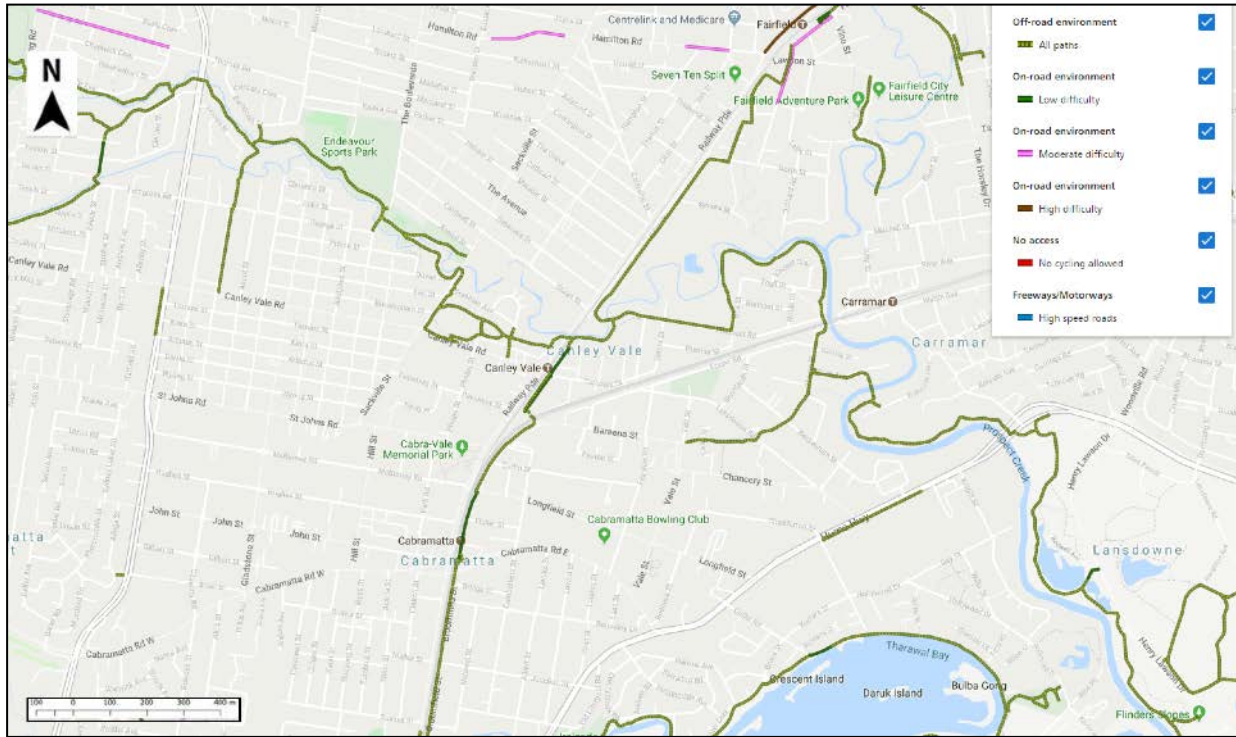
Three school bus services operate to the Station during the weekday afternoon peak period:

- Route 9502 from Fairfield High School
- Route 9548 from Patrician Brothers College
- Route 9557 from Mary Mackillop College.

## **Bicycle network and facilities**

Bicycle racks exist on First Avenue adjacent to the station entrances. Bicycle racks also exist on Railway Parade at the northern end of the station near the ramp entry. Passengers have been observed to store their bicycles along the fence line adjacent to the concrete footpath access on Railway Parade.

Dedicated cycle infrastructure, such as bicycle lanes or separated paths, are limited in the vicinity of Canley Vale Station. While some of the roads surrounding the station have been identified as bicycle-friendly due to their design and low traffic volumes, the formal cycle network currently lacks sufficient infrastructure to encourage increased use of this mode for travel to and from Canley Vale Station (refer Figure 11).



**Figure 11 Existing bicycle network surrounding Canley Vale Station**

## Pedestrian facilities

Concrete footpaths connect to all station access points. Station access points join with the pedestrian footbridge connecting to station platforms. Station stairs and ramp accesses are provided on both sides of the station, providing a connection from Railway Parade and First Avenue to platforms and the pedestrian footbridge.

### 6.1.2 Potential impacts

#### Construction phase

##### Road network and traffic

Canley Vale Station is situated between the two local roads Railway Parade and First Avenue. Construction traffic would be able to access the northern and southern sides of the station via existing rail corridor access/egress points from these roads. It is assumed heavy vehicle routes would be on the State road network, with possible local road traffic control and parking restrictions on local roads to provide access to the site.

Construction haulage routes are likely to include the following roads, subject to additional analysis during the detailed design phase:

- Cumberland Highway
- Canley Vale Road
- Railway Parade

- Pevensey Street
- First Avenue
- Cabramatta Road West
- Cabramatta Road East
- Broomfield Street
- Hume Highway
- Orange Grove Road

The proposed construction activities are anticipated to lead to short-term increases in traffic volumes on the local road network surrounding Canley Vale Station, particularly during weekend rail possession periods. Construction traffic generated is likely to vary during the construction period and would be confirmed in the detailed design and construction planning phase.

Traffic impacts arising from the Proposal during construction would be minor and manageable subject to the preparation and activation of Construction Traffic Management Plans (CTMPs) that would be prepared as part of a broader Construction Environmental Management Plan (CEMP).

#### *Parking*

It is acknowledged that construction workers may contribute to a minor increase in demand for local parking and would be required to park away from the station, not within commuter carparks and encouraged to car pool where practicable.

#### *Public transport*

It is not anticipated the construction works would impact on the public transport network. The closest bus stop is approximately 40 metres to the south of the station entrance on Railway Parade and would not be affected during work. Train services would not be affected during the work as TfNSW would be using scheduled rail possessions.

#### *Pedestrians and Cyclists*

Access to the station is expected to be maintained at all times during the construction period except during scheduled rail possessions. Pedestrians and cyclists may however experience temporary and short term detours or alternative station access arrangements on Railway parade and First Avenue to facilitate aspects of the Proposal such as the upgrade of accessible paths, widening of station entry stairs and new kerb ramp and kerb adjustments.

#### *Kiss and Ride/Taxi*

Canley Vale Station does not have a formal kiss-and-ride facility, however the combined taxi and bus zone on the eastern side of Railway Parade is used as an informal pick up and drop off area. The combined taxi and bus zone would not be impacted during the construction phase of the Proposal.

#### *Property access*

Property access would be maintained during construction to minimise the impact to local residents. During activities such as unloading of oversized materials, short-term diversions to properties may be necessary. In such incidences, affected residents would be notified in advance of the scheduled work.

## Operation phase

The Proposal would result in positive impacts in terms of contributing towards making public transport more accessible to the community.

### *Road network and traffic*

The Proposal would increase accessibility to Canley Vale Station and improve the customer experience and amenity, potentially leading to a minor increase in utilisation and patronage. This may be due to customers either travelling by train where they did not before, or by changing from another nearby station.

As a result, there may be a minor increase in traffic generation however, it is projected to be minor and would have a negligible impact on the surrounding road network or the amenity of local residents. Importantly, the Proposal features infrastructure improvements that reflect the current mode share of users and would not introduce or require changes in current travel behaviours and patterns.

### *Parking*

There would be a loss of three parking spaces on First Avenue for the provision of one accessible parking space and the kiss and ride bay.

A minor indirect change to parking, i.e. an increase in parking demand, may also result from increased station patronage.

### *Public transport*

The Proposal does not include changes to bus or rail services and would not result in an impact on the operation (service operation or timetabling) of public transport in the vicinity of Canley Vale Station.

### *Pedestrians and Cyclists*

Pedestrian access to the station would be improved through installation of new lifts and wider stairs for improved access to the station platform.

No changes to the bicycle network or bicycle parking are proposed.

### *Kiss and ride*

The Proposal would create a formalised kiss and ride area on First Avenue allowing for safe pick up and drop off.

### *Property access*

The Proposal is not expected to have any impact on existing access to properties in the vicinity of Canley Vale Station.

## 6.1.3 Mitigation measures

A Construction Traffic Management Plan (CTMP) would be prepared by the Construction Contractor in consultation with TfNSW and provided to Fairfield City Council. The CTMP would be the primary tool to manage potential traffic and pedestrian impacts associated with each phase of construction. The CTMP, at a minimum, would include:

- procedures for preparing and implementing Traffic Control Plans (TCPs) which would provide details for signage and timing of any detours (if required) or traffic controls to manage temporary road disruptions
- identification of final construction traffic access routes, site compound, contractor parking and loading zones

- nomination of access routes to and from the local road network and contractor parking
- scheduling of work/deliveries to avoid peak times and limiting of work in the road carriageway as much as practicable to limit parking losses and maintain customer access to the station
- measures to:
  - limit temporary parking losses
  - maintain customer access to and from the station
  - maintain private property access unless otherwise agreed
  - identify changed traffic/pedestrian conditions including details of construction signage including signposts and variable message signs, traffic controllers and other community notifications.

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

## 6.2 Landscape and visual amenity

A Landscape Character and Visual Impact Assessment was undertaken by Envisage for the Proposal (Envisage, 2019). The assessment included desktop analysis, site inspection and creation of photomontages. The photomontages provide an indication of what the Proposal may look like from key representative viewpoints once complete, in particular to demonstrate the bulk and scale, noting that materials and finishes are indicative and would be further investigated during detailed design.

The Landscape Character Assessment and the Visual Impact Assessment were prepared in accordance with the NSW Roads and Maritime Services' *Guideline for Landscape Character and Visual Impact Assessment, Environmental Impact Assessment Practice Note EIA-N04*, December 2018. The sensitivity and magnitude of the landscape and visual impact was assessed to produce a combined impact rating of negligible, low, moderate and high (Figure 12).

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

Figure 12 Landscape character and visual impact rating matrix (NSW Roads and Maritime Services, 2018)

### 6.2.1 Existing environment

#### Landscape character

The station is an integral part of the Canley Vale local centre. The immediate area comprises mostly low-density urban land uses on generally flat terrain, gently sloping to Orphan School Creek. The local shopping centre on the station's western side comprises of one and two-storey brick store fronts for retail outlets, restaurants and services. The residential area on the

station's eastern side comprises of single-story detached houses of two and three-storey walk-up flats and residential aged care units. Intermittent tall canopy trees are scattered throughout the urban area and denser vegetation occurs within the parkland along Orphan School Creek.

On the western side of the station (on Railway Parade), two buildings representing local culture are architecturally distinctive: Westacott Cottage and Tien Hau Temple. Westacott Cottage features light beige rendered masonry with veranda and corrugated iron roof typical of the late Victorian era. Tien Hau Temple is brick with 'pagoda' style roof featuring upward curves and rounded green tiles, red columns, red eaves, red lanterns, flags, and red and green decorative trim.

**Visual receivers / viewpoints**

Visual receivers are individuals and/or groups of people whose views may be affected by the Proposal. These include users of residential dwellings, commercial properties and open space/ and generally comprise residents, rail customers, motorists and pedestrians.

Canley Vale Station has a very small visual catchment due to the surrounding generally flat topography and buildings screening through views. Direct views of the station are generally only possible from close proximity: from a small section of Railway Parade, Canley Vale Road, First Avenue and Caroola Street. Six locations have been identified to represent key viewpoints to and from the Proposal. As part of the Visual Impact Assessment, an assessment was undertaken to understand the potential impacts on views as a result of the Proposal at these locations. These locations are shown in Figure 13.



**Figure 13 Visual impact assessment viewpoints**

**6.2.2 Potential impacts**

**Construction phase**

During construction, local landscape character would be temporarily reduced by the appearance of construction activities (including the use of large equipment).

The most significant change to viewpoints was assessed to occur during the temporary construction period. Some viewpoints would be in very close proximity to the construction zone and construction activities would be an immediately apparent (and unavoidable) part of the visual landscape.

The visual impact during construction was assessed as moderate from one viewpoint (VP6 – First Avenue, which includes the closest residence to the station), and moderate-low from all other viewpoints.

### **Operation phase**

Photomontages have been prepared from the following four Viewpoints:

- VP1: View from Railway Parade (north of the station)
- VP2: View from Railway Parade (south of the station)
- VP4: View from Canley Vale Road (west of the station)
- VP6: View from First Avenue / Carcoola Street intersection (east of the station).

The photomontages provide an visual indication of Proposal during operation and are included in Figure 14 to Figure 21.

Following construction, the impact to all viewpoints is predicted to be low. Although the new lift shaft would slightly increase the height of the station, the upgrade would, in general, increase the attractiveness of the station precinct. The finishes of the new structure would be textured and coloured, the widened main entry stairs would be welcoming, and the new station elements would be relatively compatible with the surrounding character.



Figure 14 View from Railway Parade (north of the station) – Existing view



Figure 15 View from Railway Parade (north of the station) – Future View (indicative only, subject to detailed design)





Figure 16 View from Railway Parade (south of the station) – Existing view



Figure 17 View from Railway Parade (south of the station) – Future View (indicative only, subject to detailed design)



Figure 18 View from Canley Vale Road (west of the station) – Existing view



Figure 19 View from Canley Vale Road (west of the station) – Future View (indicative only, subject to detailed design)



**Figure 20 View from First Avenue / Carcoola Street intersection (east of the station) – Existing view**



**Figure 21 View from First Avenue / Carcoola Street intersection (east of the station) – Future View (indicative only, subject to detailed design)**

**6.2.3 Mitigation measures**

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

The detailed design of the Proposal is to be undertaken with reference to the recommendations included in the Landscape Character and Visual Impact Assessment (Envisage, 2019). Key project-specific mitigation includes:

- Incorporate planting (including canopy trees where possible) in the Urban Design Plan, to integrate the new structure, existing vegetation and the setting
- Consider incorporating cultural motifs (colours, textures) onto the plain, external wall of the station building (facing Railway Parade), to reflect stories/images from the local community

Measures to mitigate visual impacts during construction would be included in a CEMP for the Proposal and would include measures such as minimising light spill during night works and screening of compounds.

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

## **6.3 Noise and vibration**

A Noise and Vibration Impact Assessment was prepared for the Proposal by SLR (2019). The noise assessment included monitoring, modelling, analysis of the potential for impacts on residents and other sensitive receivers, and the identification of management measures where reasonable and feasible. The findings of the assessment are summarised in this section.

### **6.3.1 Existing environment**

#### **Noise Catchment and sensitive receivers**

The following noise catchment areas (NCAs) around Canley Vale Station were identified based on the type and location of potentially sensitive noise receivers in the area:

- NCA01- Receivers located on the eastern side of the rail corridor, north of Carcoola Street. Mostly single story residential buildings on Carcoola Street. Other sensitive receivers include Australian Chinese Descendants Mutual Aged (ACDMA) Hostel association, Orphan School Creek and Kwan Yin Temple on Second Avenue
- NCA02- Receivers located on the eastern side of the rail corridor, south of Carcoola Street. Mostly single story residential buildings. Other sensitive receivers include the Pal Buddhist School on the corner of First Avenue and Carcoola Street. Closest receivers located 35 metres east of Canley Vale Station platform
- NCA03- Receivers located on the western side of the rail corridor- Mostly multi storey residential buildings with mixed commercial units located adjacent to the station on Canley Vale Road. Closest receivers located approximately 20 metres west of the Canley Vale Station platform.

#### **Noise Monitoring**

Noise monitoring was undertaken in the field to assist in characterisation of the ambient and background noise environment around Canley Vale Station. Both unattended and operator attended noise monitoring was conducted at two locations (L01 and L02) within the east side of the rail corridor. L01 was within NCA01 and L02 within NCA02. Monitoring results are in Table 6 and Table 7.

**Table 6 Noise monitoring results – unattended (recorded between 14 October 2019 and 24 October 2019)**

Measurement location	Period	Measured noise level L <sub>90</sub> (dBA)	Measured noise level L <sub>Aeq</sub> (dBA)	Measured noise level L <sub>A10</sub> (dBA)	Measured noise level L <sub>A1</sub> (dBA)
L01 1 Carcoola Street, Canley Vale	Day (7am-6pm)	42	58	60	67
	Evening (6pm-10pm)	43	56	59	66
	Night (10pm-7am)	35	53	51	63
L02 20 First Avenue, Canley Vale	Day (7am-6pm)	47	60	63	68
	Evening (6pm-10pm)	48	60	64	59
	Night (10pm-7am)	37	56	58	67

**Table 7 Noise monitoring results – operator attended (recorded on 14 October 2019)**

Measurement location	Measured noise level L <sub>max</sub> (dBA)	Measured noise level L <sub>Aeq</sub> (dBA)	Measured noise level L <sub>90</sub> (dBA)	Observations (dBA)
L01 1 Carcoola Street, Canley Vale	80	59	46	Light-vehicle passby: 58-62 Heavy-vehicle passby: 70-78 Train passby: 52-53 Distant traffic: 44-46
L02 20 First Avenue, Canley Vale	82	59	50	Light-vehicle passby: 60-65 Heavy-vehicle passby: 72-75 Train passby: 64-65 Distant traffic: 52-55

### 6.3.2 Potential impacts

#### Construction phase

##### *Construction noise criteria*

The assessment of construction noise impacts was undertaken in accordance with a series of industry practice guidelines, including:

- Department of Environment and Climate Change, 2009, *Interim Construction Noise Guideline* (ICNG)

- Australian Standards, 2016, AS2107:2016 – Recommended design sound levels and reverberation times for building interiors.

Based on noise criteria presented in these guidelines, and the measured background noise levels at the Proposal site (refer Section 6.3.1) a series of noise management levels (NMLs) have been derived for the Proposal, outlined in Table 8. In the event construction noise levels are predicted to be above these NMLs, reasonable and feasible measures (such as equipment selection and location, construction scheduling and respite periods) should be implemented to reduce noise levels as far as practicable.

**Table 8 NMLs for construction**

NCA	Standard hours (RBL + 10 dBA)	Out of hours – daytime <sup>1</sup> (RBL + 5 dBA)	Out of hours – evening <sup>1</sup> (RBL + 5 dBA)	Out of hours – night time <sup>1</sup> (RBL + 5 dBA)	Sleep disturbance (RBL + 15 dBA)
NCA01 - Residential	52	47	47	40	50
NCA01- Childcare centre	50	50	n/a	n/a	n/a
NCA01- Places of worship	55	55	55	n/a	n/a
NCA02 - Residential	57	52	52	42	52
NCA02- Childcare centre	50	50	n/a	n/a	n/a
NCA02- Educational	55	55	n/a	n/a	n/a
NCA03 - Residential	57	52	52	42	52
NCA03 – Childcare centre	50	50	n/a	n/a	n/a
NCA03 – Educational	55	55	n/a	n/a	n/a
NCA – Places of Worship and Library	55	55	55	n/a	n/a

*Note 1: Standard hours are listed in Section 3.3.3. Out of hours 'Daytime' hours are 1pm to 6pm Saturday and 8am to 6pm Sunday. Out of hours 'Evening' hours are 6pm to 10pm Monday to Sunday. Out of hours 'Night-time' hours are 10pm to 7am Sunday to Saturday and 10pm Saturday to 8am Sunday*

### *Predicted construction noise impacts*

To assess the potential impacts from the proposed work, the construction work in Chapter 3 were used to develop indicative construction scenarios comprising typical plant and equipment, the scenarios developed were:

- site establishment
- main work – during standard construction hours
- interchange work
- site demobilisation.

In order to quantify noise emissions from the proposed construction work, a 3D computer noise model was used to predict noise levels at the nearest receivers.

The predictions include the source noise levels of the anticipated equipment, the location of the nearest sensitive receivers, the number of plant items likely to be operating at any given time, the distance between the equipment and the receivers, and shielding or reflections provided by topography and/or buildings.

Predicted noise levels are provided in the Noise and Vibration Impact Assessment for the Proposal (SLR, 2019). The impacts are summarised in Table 9.

**Table 9 Summary of predicted noise impacts**

Work scenario	Summary of predictions	Timing and duration of work
Site establishment	<p>During establishment of site compounds, the most potentially affected residential receivers are predicted to exceed the daytime NMLs by up to 13 dB, 9 dB, and 12 dB, in NCA01, NCA02, and NCA03 respectively. During these noise-intensive work the receivers with NML exceedances are generally limited to those with direct line of site to the equipment and are situated within 200 m.</p>	<p>Site establishment works are proposed to be undertaken during standard daytime construction hours only.</p>
Main work	<p>During the less intensive piling, concreting and installation work, the most potentially affected residential receivers are predicted to exceed the daytime NMLs by up to 18 dB and 10 dB in NCA01 and NCA02 respectively, and no residential NML exceedances in NCA03. However, the highest predicted noise levels in NCA03 exceed the daytime NMLs for commercial and place of worship categorised receivers by up to 9 dB.</p> <p>NML exceedances of this magnitude would generally be limited to sensitive receivers with a line of site to the proposed equipment for these works.</p> <p>The highest impacts are associated with demolition and platform resurfacing work. During these scenarios exceedances of the daytime NMLs of up to 30 dB, 18 dB, and 11 dB are predicted for the nearest residential receivers in NCA01, NCA02, and NCA03 respectively.</p> <p>Similarly, exceedance of the night-time NMLs are predicted up to 42 dB, 33 dB, and 26 dB at the nearest residential receivers in NCA01, NCA02 and NCA03 respectively.</p> <p>The high magnitude of these impacts at the most potentially affected sensitive receivers is largely the result of the highly noise intensive concrete saw, jackhammer, and vibratory roller included in the proposed work scenarios. Additionally, the night-time noise management levels are based on the notably lower background noise level during this period. The culmination of these factors results in an increased risk of sleep disturbance at many surrounding residential receivers.</p>	<p>The majority of the main work associated with lift construction and platform resurfacing are proposed to occur during standard daytime construction hours and during out-of-hours periods occurring during scheduled Sydney Trains track work periods.</p>



Work scenario	Summary of predictions	Timing and duration of work
Interchange work	Exceedances of the daytime NMLs up to 36 dB, 19 dB and 12 dB are predicted for the nearest residential receivers in NCA01, NCA02 and NCA03 respectively during the proposed interchange upgrades. Exceedances of the night-time NMLs up to 48 dB, 34 dB and 27 dB are predicted for the nearest residential receivers in NCA01, NCA02 and NCA03 respectively. Similarly to the Main work, these worst-case exceedances are driven by the use of a concrete saw, jackhammer, and vibratory roller.	The interchange work activities are proposed to be undertaken during standard daytime construction hours and during out-of-hours periods occurring during shorter duration scheduled Sydney Trains track work periods.
Site demobilisation	The most potentially affected residential receivers are predicted to exceed the daytime NMLs by up to 13 dB, 11 dB and 9 dB, in NCA01, NCA02 and NCA03 respectively. The noise profile of these work is similar to that of site establishment with the exclusion of the vegetation removal work. Sensitive receivers with NML exceedances are generally limited to those with that have a line of sight to the work and are situated within 200 m.	Site demobilisation activities are proposed to be undertaken during standard daytime construction hours only.

### *Highly noise affected receivers*

Receivers are considered to be highly noise affected if noise levels from construction exceed 75 dBA  $L_{Aeq(15\text{minute})}$ . Due to the close vicinity of the work to receivers directly adjacent to Canley Vale Station. Worst case construction daytime noise levels are predicted above 75 dBA  $L_{Aeq(15\text{minute})}$  in all NCAs during the operation of noise intensive equipment.

The location of receivers with potential to be highly noise affected during noise intensive times is shown in Figure 22.



**Figure 22 Highly noise affected receivers**

*Cumulative noise impacts*

Cumulative noise impacts warrant assessment where more than one work scenario operates at the same time and in the same location such that the same receiver is impacted by noise from more than one work scenario. Generally, the proposed works are scheduled in consecutive phases and therefore cumulative noise impacts are not predicted as the assessment is controlled by noise impacts from the individual phases (as assessed).

*Noise impacts at educational receivers*

Pal Buddhist School is situated in NCA02, directly to the east of the existing Canley Vale Station and proposed construction work areas. Due to its immediate proximity to the work this

receiver has maximum exceedances of the daytime NML for educational facilities predicted between 10 dB and 31 dB at times during the work scenarios.

Additionally, Canley Vale Public School and Sacred Heart Catholic Primary School are situated approximately 450 m to the west of the proposed work in NCA03. Relatively minor impacts are predicted for these schools, with a maximum exceedance of the daytime NML for educational facilities predicted up to 5 dB.

#### *Construction road traffic*

Construction traffic is not expected to exceed 20 light vehicles and 10 heavy vehicles per day during peak construction periods (including scheduled Sydney Trains rail possessions) and would be less when work are undertaken during standard construction hours.

The relatively small number of construction vehicles accessing the site is predicted to have an insignificant effect on existing road traffic noise levels and further consideration of noise impacts due to construction traffic is not required.

#### *Construction vibration criteria*

The assessment of construction vibration impacts was undertaken in accordance with a series of industry practice guidelines. Criteria for constant vibration and transient vibration are outlined in Table 10 and Table 11.

**Table 10 Acceptable vibration dose values for intermittent vibration (Source: EPA 2006)**

<b>Building type</b>	<b>Assessment period</b>	<b>Vibration dose value – preferred (m/s<sup>1.75</sup>)</b>	<b>Vibration dose value - maximum (m/s<sup>1.75</sup>)</b>
Critical Working Areas (eg hospital operating theatres, precision laboratories)	Day or night time	0.10	0.20
Residential	Daytime	0.20	0.40
Residential	Night time	0.13	0.26
Offices, schools, educational institutions and places of worship	Day or night time	0.40	0.80

Note 1: The VDV accumulates vibration energy over the daytime and night-time assessment periods, and is dependent on the level of vibration as well as the duration.

**Table 11 Transient vibration guide values for minimal risk of cosmetic damage (Source: British Standards, 1993)**

Type of building	Peak component particle velocity – 4Hz to 15Hz	Peak component particle velocity – 15Hz and above
Reinforced or framed structures industrial and heavy commercial buildings	50 mm/s at 4 Hz and above	
Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

**Table 12 Recommended minimum working distances for vibration intensive plant**

Plant item	Rating / description	Minimum working distance – cosmetic damage (BS7385)	Minimum working distance – human response (EPA, 2006)
Vibratory roller	< 50 kN (Typically 1-2t)	5 m	15 m to 20 m
	< 100 kN (Typically 2-4t)	6 m	20 m
	< 200 kN (Typically 4-6t)	12 m	40 m
	< 300 kN (Typically 7-13t)	15 m	100 m
	> 300 kN (Typically 13-18t)	20 m	100 m
	> 300 kN (Typically > 18t)	25 m	100 m
Small hydraulic hammer	300 kg - 5 to 12t excavator	2 m	7 m
Medium hydraulic hammer	900 kg - 12 to 18t excavator	7 m	23 m
Large hydraulic hammer	1600 kg - 18 to 34t excavator	22 m	73 m
Jackhammer	Hand held	1 m (nominal)	Avoid contact with structure
Bored piling	< 800 mm	2 m	n/a

The minimum working distances for building damage should be complied with at all times, this is displayed in Table 12. The distances are noted as being indicative and would vary depending on the particular item of plant and local geotechnical conditions. In relation to human comfort, the minimum working distances relate to continuous vibration. For most construction activities, vibration emissions are intermittent in nature and for this reason, higher vibration levels, occurring over shorter periods are allowed.

### Construction vibration impacts

Vibration intensive equipment is proposed during the main work scenarios which include the use of a vibratory roller, jackhammers and bored piling. Based on the safe working distances presented in the *Construction Noise and Vibration Strategy* (TfNSW, 2018b), indicative vibration levels at the representative receivers are shown in Table 13.

**Table 13 Indicative vibration levels at nearby receivers**

Receiver	Approximate distance to works <sup>1</sup>	Indicative vibration level (mm/s) <sup>2</sup>
NCA01 Residential	20m	4.8 mm/s
NCA02 Educational facility	40m	1.6 mm/s
NCA03 Commercial	15m	7.5 mm/s

Note 1: Approximate distance of works areas within the Proposal area

Note 2: Estimated from the safe working distances specified in TfNSW (2018b) for a medium vibratory roller (< 50 kN, Typically 7-13 tonnes) and assumed dense rock.

In terms of cosmetic damage, the information in Table 13 indicates that the separation distance from the nearest receivers is sufficient to mitigate the potential impacts for a medium sized vibratory roller. However, it must be noted that if a vibratory roller is not undertaken, the vibration predictions would be substantially lessened. Other items of plant (jackhammer, bored piling) are associated with a lower vibration level, and are not identified any closer to the receivers than the vibratory rolling scenario. As such, it is considered that structural or cosmetic damage impacts from vibration intensive work are unlikely for the adjacent receivers.

In terms of human comfort, vibration at the nearest receivers is likely to be perceptible at times during the works. For vibratory rolling, where the nearest affected residential receiver is located approximately 15 m from the work area, assuming a medium vibratory roller operating continuously near the adjacent site boundary, it is anticipated that the day-time vibration dose value criterion of 0.4 m/s<sup>1.75</sup> would be reached within an impractical working time.

For the majority of receivers surrounding the relevant work area which are situated around 50 m from the site boundary, the time to reach the day-time vibration dose value criterion of 0.4 m/s<sup>1.75</sup> is anticipated to be in the region of 45 minutes for a medium vibratory roller operating continuously near the adjacent site boundary.

### Heritage Buildings

The following heritage listed structures have been identified within approximately 100m of the proposed work involving vibration-generating plant:

- I25 – 2 Canley Vale Road, Corner Shop
- I28 – Railway Parade - Railway Viaduct
- I29 – 110 Railway Parade - Victorian Cottage ‘Westacott Cottage’
- I35 – 1 Stuart Street – Victorian House
- I31 – 2 Second Avenue – Temple.

Heritage buildings within 50 metres would be assessed by a pre-construction survey. Mitigation measures are listed in full in Section 7.2.

## Operation phase

### *Operational noise criteria*

The *Noise Policy for Industry* (EPA, 2017) sets out to control intrusive noise levels over the short term and also maintain noise amenity levels over the medium to long-term, relevant to land use. The EPA (2017) Policy includes procedures for establishing the project intrusiveness  $L_{Aeq(15\text{minute})}$  and project amenity  $L_{Aeq(\text{period})}$  noise levels, where the lower (i.e. more stringent) is then adopted as the project trigger noise level.

Applicable project trigger noise levels for all noise sensitive receiver areas surrounding the Proposal have been calculated and are shown in Table 14.

**Table 14 Project trigger noise levels – residential**

NCA	Time of day	Intrusive <sup>1</sup> (dBA)	Amenity <sup>2</sup> (dBA)	Overall project trigger noise level <sup>3</sup> (dBA)
NCA01	Day	47	53	47
	Evening	47	44	44
	Night	40	38	38
NCA02	Day	52	53	52
	Evening	52	48	48
	Night	42	38	38
NCA03	Day	52	53	52
	Evening	52	48	48
	Night	42	38	38

*Note 1: Project intrusive noise level is RBL + 5dB*

*Note 2: Project amenity (period) noise level is the prescribed amenity criteria minus 5dB*

*Note 3: Resulting project trigger noise level is the lower of the project intrusive and project amenity noise levels*

### *Operational noise impacts*

The key identified fixed noise sources associated with the station upgrade include a new power transformer and new station lifts. At this stage of the design, specific transformer and lift systems have not been selected, which means it is too early to assess compliance with the applicable noise criteria. However given this type of noise source generally has relatively low noise emissions, it is anticipated that the transformer and lift system designs could be relatively easily mitigated if required during the detailed phase of the Proposal through the selection of appropriate equipment.

Cumulative noise impacts from all station noise sources should be assessed in the detailed design stage when selecting specific equipment locations and models for the lift facilities.

### 6.3.3 Mitigation measures

The following mitigation measures are proposed with respect to potential noise and vibration impacts:

Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Construction Noise and Vibration Strategy* TfNSW, 2018b, the Noise and Vibration Impact Assessment (SLR, 2019) and in consultation with impacted receivers. The CNVMP would prescribe reasonable and feasible mitigation measures to minimise construction noise and vibration.

For any highly affected noise receivers (over 75 dB), TfNSW would communicate with the impacted residents regarding the duration and noise level of the work, and by describing any respite periods that would be provided. Where vibration intensive works are required to be undertaken within the specified safe working distances outlined in the Noise and Vibration Assessment (SLR, 2019), or in close proximity to vibration sensitive heritage structures such as the station building and existing footbridge, vibration monitoring should be undertaken to ensure acceptable levels of vibration are satisfied.

Equipment should be limited to low vibration items (ie non-vibratory rollers) when works are required within 50 m of any heritage structure. This is to be confirmed with site measurements to quantify the site-specific vibration levels. This would be undertaken prior to commencement of the works near any sensitive structures and include operator-attended monitoring.

To avoid structural impacts as a result of vibration, the proposed work would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (SLR, 2019), and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged. This would include undertaking a pre-construction building condition survey of heritage structures within 50 metres, and require minimum working distances to be confirmed prior to carrying out any vibration intensive work on site.

Mitigation measures are listed in full in Section 7.2

## 6.4 Aboriginal heritage

### 6.4.1 Existing environment

The original inhabitants for many thousands of years prior to European settlement of the Fairfield area were the Cabrogal of the Darug Nation (Fairfield City Council, 2019).

Certain landscape features, such as waterways, sand dunes, ridge tops, cliffs and rock caves can indicate the likely presence of Aboriginal sites. Orphan School creek is located 45 metres north of the Canley Vale Station boundary, no other landscape features are present immediately surrounding the station.

The Proposal is not considered to be located within a high-risk landscape for Aboriginal heritage potential in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (OEH, 2010). Extensive landscape modification and high level disturbance that has occurred due to development of the rail corridor, within and across the Proposal area suggests that the archaeological potential of the area is low.

The following searches were undertaken on the 16 September 2019 to identify any registered Aboriginal objects, sites or places around Canley Vale Station:

- An Aboriginal Heritage Information Management System (AHIMS) basic search was undertaken for the area covered by the Proposal (the area directly around Canley Vale Station) with a 50 metre radius. No Aboriginal sites were identified in the search.

- NSW State Heritage Inventory (SHI) Aboriginal place search. No items were identified in the vicinity.

## **6.4.2 Potential Impacts**

### **Construction phase**

Construction of the Proposal would involve some minor excavation and other ground disturbing activities for the foundations and pits of the two lift shafts and potential trenching excavation for electrical work (refer to Section 3.3.4). Ground disturbing activities have the potential to impact Aboriginal sites, if present.

As no known Aboriginal Heritage items are located in the vicinity of the Proposal area, and the construction footprint is located within a previously disturbed urban environment, the potential for unknown items to be present is considered to be low. As such, the proposal is unlikely to affect Aboriginal Heritage during construction.

### **Operation phase**

Risks to Aboriginal heritage from the operation of the Proposal are not anticipated.

## **6.4.3 Mitigation measures**

If previously unidentified Aboriginal objects are uncovered during construction, in accordance with TfNSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2019b), work would cease in the vicinity of the find and the TfNSW Project Manager and TfNSW Environment and Planning Manager would be notified immediately to assist in co-ordinating next steps which are likely to involve consultation with an archaeologist, the DPIE Energy, Environment and Science Group, and the Local Aboriginal Land Council/s. If human remains are found, work would cease, the site would be secured and the NSW Police and the Energy, Environment and Science Group would be notified.

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

## **6.5 Non-Aboriginal heritage**

### **6.5.1 Existing environment**

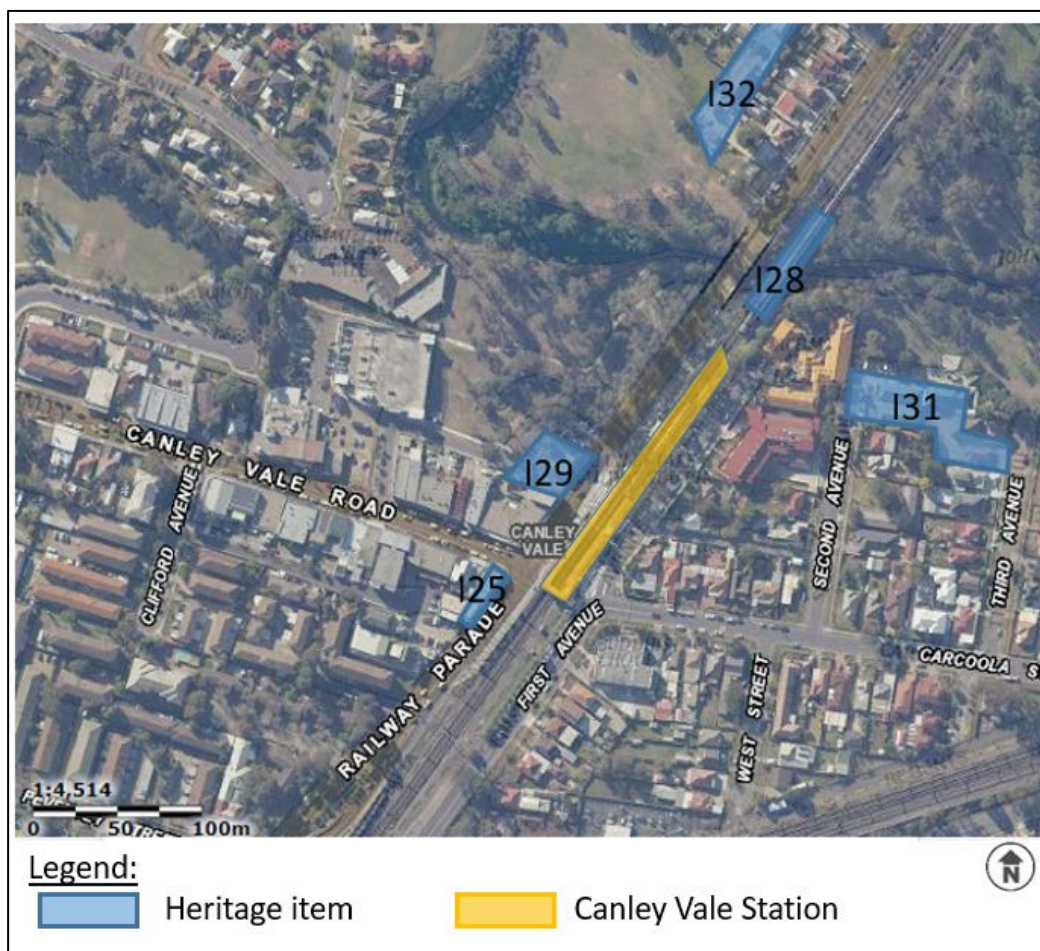
Heritage register searches were undertaken on 16 September 2019 for the area surrounding the Proposal using the World Heritage List, Commonwealth Heritage List, National Heritage List, the Register of the National Estate (non-statutory archive), NSW State Heritage Register, RailCorp's Section 170 Heritage Conservation Register and the Fairfield LEP 2013 - Schedule 5.

The desktop search identified five items within the surrounding area which have a heritage listing, refer to Table 15 and Figure 23. Canley Vale Station is not listed on any of these registers.



**Table 15 Heritage items in proximity to the Proposal**

Register	Item	Distance from Proposal	Significance
I28 - Fairfield LEP (2013) and RailCorp Section 170 Heritage and Conservation Register	Canley Vale (Orphan School Ck) Viaduct	25 metres north of Canley Vale Station	Local and Section 170 Heritage Register
I25- Fairfield LEP (2013)	Corner Shop – 2 near Canley Vale Road, Canley Vale	20 metres	Local
I29- Fairfield LEP (2013)	Victorian cottage -'Westacott Cottage' - 110 Railway Parade, Canley Vale	20 metres	Local
I31- Fairfield LEP (2013)	Temple – 2 Second Avenue, Canley Vale	88 metres	Local
I32- Fairfield LEP (2013)	Victorian House - 1 Stuart Street, Canley Vale	133 metres	Local



**Figure 23 Heritage items close to the Proposal**

## **6.5.2 Potential impacts**

### **Construction phase**

Floor vibrations may be perceived during certain construction activities by people, well below the levels likely to cause damage to building contents or operation of typical equipment. There are a number of heritage items located within close proximity to the Proposal area, with two heritage items located 20 metres away. It is unlikely that the Proposal would result in any direct or indirect (i.e. vibration) impacts on these heritage items

Access to the site would be via Railway Parade, but these activities are not anticipated to impact any heritage items.

Construction work would be undertaken within previously disturbed areas and given the historical and ongoing development and modification in the area, no areas of specific archaeological sensitivity have been identified.

### **Operation phase**

There would be no risks to non-Aboriginal heritage items from the operation of the Proposal.

## **6.5.3 Mitigation measures**

Equipment should be limited to low vibration items (ie non-vibratory rollers) when works are required within 50 m of any heritage structure. This is to be confirmed with site measurements to quantify the site-specific vibration levels. This would be undertaken prior to commencement of the works near any sensitive structures and include operator-attended monitoring.

To avoid structural impacts as a result of vibration, the proposed work would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (SLR, 2019), and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged. This would include undertaking a pre-construction building condition survey of heritage structures within 50 metres, and require minimum working distances to be confirmed prior to carrying out any vibration intensive work

Attended vibration measurements shall be undertaken at all buildings within 25 m of vibration generating activities when these activities commence to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage.

Mitigation of non-Aboriginal heritage impacts would be limited to the management of any unknown impacts to non-Aboriginal heritage through worker inductions and protocols for unexpected finds.

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

## **6.6 Biodiversity**

### **6.6.1 Existing environment**

#### **Landscape context**

Canley Vale Station is located within a highly modified urban environment. Vegetation within the Proposal area consists of landscaped garden beds on both sides of the rail line. The garden beds consist of native and exotic vegetation as well as some remnant trees.

Information about the ecological values of the site and its surrounds was derived from the following sources:

- NSW Office of Environment and Heritage Atlas of NSW Wildlife

- Commonwealth Department of Agriculture, Water and the Environment Protected Matters Search Tool.

## **Threatened species and ecological communities**

### *Ecological Communities*

The Endangered Ecological Community (EEC) River-Flat Eucalypt Forest is located about 25 metres to the west of Railway Parade.

The vegetation within the development footprint does not conform in species composition, structure or habitat with an Endangered Ecological Community (EEC) under the BC Act or EPBC Act.

### *Threatened flora species*

The database search identified 11 State and 11 Commonwealth listed flora species records within a 5 km radius of Canley Vale Station.

The surrounding landscaped areas do not provide appropriate habitat for threatened flora.

### *Threatened fauna species*

The database search identified 30 BC Act and 18 EPBC Act fauna records within a 5 km radius of the site. The EEC to the west of the Station may provide suitable habitat for threatened fauna species.

### *Groundwater and inflow dependent ecosystems*

Orphan School Creek and its local riparian habitat form a groundwater and inflow dependent ecosystem. The success and health of this ecosystem relies upon a regular supply of surface and groundwater. Also, surface and groundwater quality are important to ensure ecosystem health.

## **6.6.2 Potential impacts**

### **Construction phase**

Given the lack of native vegetation and habitat resources within the Proposal area, construction of the Proposal would not have a direct or indirect impact on any biodiversity values. Construction of the Proposal would not require the removal of vegetation and would not have a significant impact on any threatened or migratory biota listed under the BC or EPBC Acts. There is minimal potential for unexpected or unrecorded threatened biota to occur within the Proposal area due to its disturbed nature and lack of suitable habitat. The landscape planting and street trees only hold an intrinsic ecological value and likely support tolerant native and non-native fauna.

### **Operation phase**

Given the locality and sensitivity of the groundwater and inflow dependent ecosystem associated with Orphan School Creek there is the risk that it may be affected by a change in drainage characteristics, volumes, rates and stormwater quality runoff. While it is possible that groundwater flows or patterns may be affected by installing in-ground foundations to support the lifts, their scale and distance from the Creek is unlikely to have any material impact.

## **6.6.3 Mitigation measures**

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

## 6.7 Socio-economic impacts

A review of the 2016 Australian Bureau of Statistics (ABS) Census data was undertaken for the suburb of Canley Vale. Canley Vale had a population of 10,216 people with a median age of 36 years. Of the employed persons at Canley Vale, 20.6 per cent used public transport as at least one of their methods to travel to work, 15.2 per cent being via train.

According to the TfNSW Transport Performance and Analytics data, the average daily patronage at Canley Vale Station in 2017 was 4,860 passengers and is forecast to increase to 7,479 passengers by 2036.

The built environment around the station predominantly comprises detached single storey houses and apartment buildings (up to three storeys); and single and two-storey main street retail shops. The Canley Vale local centre is located on the western side of the railway corridor. Within 500m of the station are:

- two primary schools (Caney Vale Public School on Canley Vale Road and Pal Buddhist School on First Avenue)
- a pre-school
- two temples (Tien Hau Temple on Railway Parade and Kwan Yin Temple on Second Avenue)
- a Cambodian cultural association
- two aged care residential facilities (Summit Care on the western side of the station and Australian Chinese and Descendants Mutual Association (ACDMA) Aged Care on the eastern side).

### Construction phase

The Proposal has the potential to impact station customers, pedestrians, adjacent residents (including nursing home residents), school students, commercial facilities and motorists due to:

- minor increase in traffic including truck movements delivering site materials, plant and equipment
- changes to traffic and pedestrian arrangements and transport
- temporary closure / relocation of toilet facilities at the station
- construction noise, vibration, dust and visual impacts.

### Operation phase

It is anticipated that the Proposal would result in the following benefits to Canley Vale and the wider area including:

- improved and equitable access to Canley Vale Station for customers resulting from the installation of lifts, widening of the stairs, accessible parking and kiss and ride facilities
- improved customer amenity and facilities at the station including a family accessible toilet, ambulant toilets, CCTV, improved wayfinding and new lighting
- Potential increased use of public transport to and from Canley Vale.

#### 6.7.1 Mitigation measures

A number of environmental safeguards would be implemented to minimise potential impacts on the community including:

- mitigation measures in respect of potential impacts to amenity (e.g. noise, dust and visual) as assessed in the relevant sections of this report and listed in Section 7.2 of this report
- development of a Community Liaison Management Plan (to be developed by the Construction Contractor prior to construction) which would identify potential stakeholders and the best-practice methods for engagement with these groups during construction. The Plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where possible
- informing the community of construction progress, activities and impacts in accordance with the Community Liaison Management Plan
- providing contact details for a 24-hour construction response line, Project Infoline and email address provided for ongoing stakeholder contact throughout the construction phase.

## **6.8 Contamination, geology and soils**

### **6.8.1 Existing environment**

#### **Landform**

Canley Vale Station is on a slight embankment with a gentle slope leading toward Orphan School Creek to the north east. A greater embankment builds toward the Pevensy Street overpass to the south west. The remaining directions consist of relatively flat land.

#### **Soils and geology**

The Penrith 1:100,000 scale Geological Series Sheet 9030 indicates that the project area is underlain by Bringelly Shale of Wianamatta Group, comprising shale, carbonaceous claystone, laminate, fine to medium grained lithic sandstone, rare coal, and tuff.

There are no exploratory locations at Canley Vale Station. Two test pits in the rail corridor approximately 250m and 350m south of the station were identified. These test pits were used in conjunction with regional geological information to form the following description of Canley Vale station; this description should be taken as a guide only of the potential geology.

The near-surface geological profile at the site is anticipated to comprise fill (0.8 – 1.3m depth) over alluvial soils, typically greater than 2m in depth over weather bedrock which consists of shales and sandstones from Bringelly Shale. Some existing filling of approximately 1m thickness may be encountered in local areas.

A search of the NSW Planning portal tool and the Sharing and Enabling Environmental Data (SEED) showed that the Proposal site is mapped as being an area of high salinity potential. The site does not contain any classification for acid sulfate soils however, the surrounding area approximately 650m north east of the site is mapped as having a high probability of occurrence of acid sulfate soils.

#### **Contamination**

Australian Standard AS 4482. 1-2005 – Guide to the investigation and sampling of sites with potentially contaminated soils – Non-volatile and semi-volatile compounds lists the chemicals used by specific industries. The standard lists the following chemicals that are commonly associated with railway yards and may be present at Canley Vale Station:

- hydrocarbons
- arsenic
- phenolics

- heavy metals
- nitrates and ammonia.

No record of contaminated land within the suburb of Canley Vale was identified on the EPA contaminated lands register (search conducted on 20 November 2019). A search of the List of NSW Contaminated Sites Notified to the EPA was also undertaken (list current at 18 November 2019), the following two service station sites within Canley Vale are listed:

- Coles Express Lansvale (1.6 km south east of Canley Vale Station)
- Former Mobil Service Station (650 m west of Canley Vale Station)

Regulation under the *Contaminated Land Management Act 1997* is not required.

The station may contain contaminated materials with the fabric of the existing buildings including:

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

There may be contaminated fill present onsite, in particular beneath the hardstand of the platform and within the footprint of the railway corridor. Soils underlying the railway corridor may have also been impacted from previous spills or leaks.

## 6.8.2 Potential impacts

### Construction phase

#### Erosion and sedimentation

The Proposal would require some excavation work for the installation of the lift shaft pits and stairs. Other trenching or excavation may be required for the relocation of services.

Excavation and other earthwork such as trenching can result in erosion and sedimentation if not undertaken with appropriate controls. Such impacts can also lead to an adverse effect on water quality and biodiversity through the introduction of sediments into waterways. Erosion and sedimentation risks for the Proposal are considered to be low, as it is expected that erosion could be adequately managed through the implementation of mitigation measures outlined in Section 7.2.

#### Contamination

Excavation also has the potential to expose contaminants, which if not appropriately managed, can present a health risk to construction workers and the community. Contaminants would also pose an environmental risk if they were to enter nearby waterways via stormwater infrastructure. As there are no confirmed contaminated sites within close proximity of the Proposal site, there is low risk of encountering contamination on the site.

During construction work, there is also the potential for soil to become contaminated through accidental chemical or fuel spills and leaks from construction plant and equipment. Such impacts would be managed with the implementation of mitigation measures outlined in Section 7.2.

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

The disturbance of saline soils would have the potential to impact the local environment if not managed properly. The erosion and transfer of saline soil offsite has the potential to alter the water quality of receiving environments which in turn may impact flora and fauna that is sensitive to elevated levels of salinity.

The implications of salinity would be considered prior to undertaking excavation works. Mitigation measures such as monitoring for salinity during excavation and ensuring saline soils are stockpiled separately and disposed of appropriately would be included in the CEMP.

Caution would be exercised in undertaking excavation in areas of salinity, particularly for the lift shafts where deeper excavations are required. Impacts associated with improper management or re-use of excavated saline soils would be avoided during construction with the implementation of mitigation measures outlined in Section 7.2.

## **Operation phase**

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

### **6.8.3 Mitigation measures**

As part of the CEMP, a site-specific Erosion and Sediment Control Plan/s would be prepared and implemented in accordance with the *'Blue Book' - Managing Urban Stormwater: Soils and Construction* (Landcom, 2004). The Erosion and Sediment Control Plan would be established prior to the commencement of construction and be updated and managed throughout according to the activities occurring during construction.

An environmental risk assessment would be undertaken prior to construction and would include a section on contamination as per the TfNSW Standard Requirements. Measures to mitigate potential impacts from contaminated soil/materials would include an unexpected contamination finds procedure and Waste Management Plan, as part of the CEMP. All waste would be managed in accordance with relevant legislation.

Appropriate mitigation measures would be implemented to manage hazardous substances during demolition work. This would include the removal of hazardous materials from the structure by appropriately licensed asbestos/hazardous waste removalists and in accordance with relevant legislation and guidelines.

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

## **6.9 Hydrology and water quality**

### **6.9.1 Existing environment**

Orphan School Creek crosses under Railway Parade and the rail corridor approximately 45m north east of Canley Vale station. It is a tributary of Prospect creek, and the confluence of these creeks is located approximately 275m downstream of this crossing.

The Canley Vale Overland Flood Study (Sinclair Knight Mertz, 2009) determined that significant overland flooding occurs in the area during the 1% Annual Exceedance Probability (AEP) event, and mapped as a medium to low risk flood precinct (refer to Figure 24).

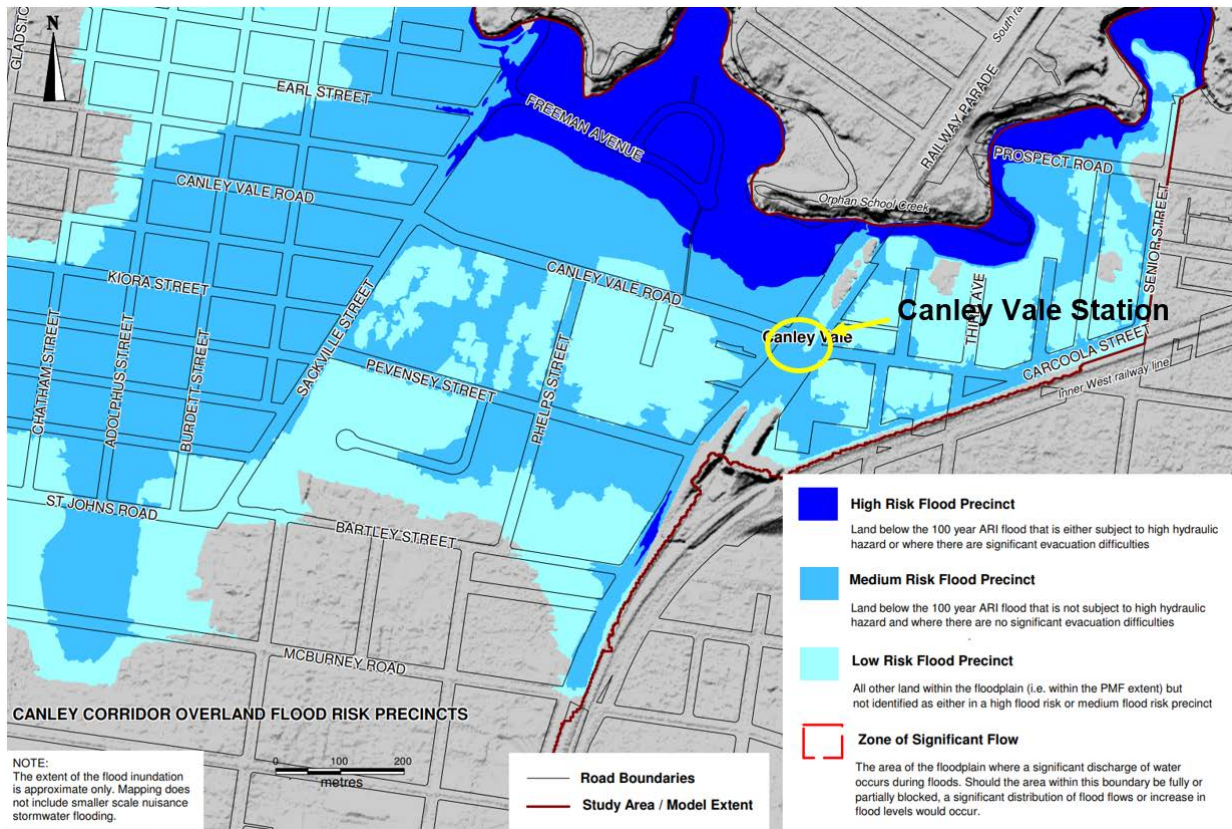


Figure 24 Flood Risk Precinct map of Canley Corridor (Sinclair Knight Mertz, 2009)

## 6.9.2 Potential impacts

### Construction phase

Without appropriate safeguards, pollutants (fuel, chemicals or wastewater from accidental spills, and sediment from excavations and stockpiles) could potentially reach nearby stormwater drains and Orphan School Creek.

Activities which would disturb soil during construction work (such as vegetation removal and excavation) have the potential to impact upon local water quality due to erosion and sedimentation. There is also potential to contaminate local water quality and the stormwater network as a result of incidental spills or inadequate fuel and chemical storage practices. In an extreme rainfall event, flooding may impact on construction activities. Moderate to heavy wet weather events may cause water flows through the Proposal area which could increase the potential for soil erosion and sedimentation impacts in the cutting and the rail corridor.

Mitigation measures have been provided below to minimise the potential for these impacts.

### Operation phase

The current flood mapping suggests that the project is within the 1% AEP flood extents. Further hydrological assessment would be undertaken during detailed design to ensure that the Proposal would not be impacted by flooding, would not worsen local flooding patterns.

The detailed design would take stormwater management into consideration. The new design would not result in a significant increase in impervious areas, as it is remaining mostly within the existing footprint.



### 6.9.3 Mitigation measures

The following flood mitigation measures are to be considered during detailed design:

- further hydrological assessment would be undertaken to ensure that the Proposal would not be impacted by flooding and would not worsen local flooding patterns
- opportunities to employ Water Sensitive Urban Design (WSUD) would be investigated and reported on, along with identification of options to reduce the runoff burden to the existing drainage system
- Fairfield City Council would be consulted in relation to detailed drainage design
- adequate measures are to be provided to reduce flood risks. The potential impacts of climate change on flooding shall be considered as part of the hydrological assessment to ensure safe access within the station and its infrastructure is maintained
- detailed design will review the impact of flooding on pits and conduits introduced by the project
- detailed design should ensure lift maintenance access is covered and above ground level

Refer to Section 7.2 for further mitigation measures.

## 6.10 Air quality

### 6.10.1 Existing environment

Based on a review of the existing land uses surrounding the Proposal, the existing air quality is characteristic of an urban environment, with some transport emission influences.

The Environment, Energy and Science Group of DPIE undertakes air quality monitoring across NSW. The site is located within the Sydney West monitoring region with air quality monitored at fixed sites. Liverpool is the closest monitoring site to the Proposal. A search of the daily regional air quality index for the Sydney West region on 26 November 2019 showed that the region experienced 'Poor' air quality values. Poor air quality has been experienced across Sydney due to a large number of bushfires burning in New South Wales.

Potentially affected receivers within the vicinity of the site include the following:

- local residents
- users of the adjacent commercial areas
- pedestrians and commuters within the Canley Vale Station precinct.

### 6.10.2 Potential impacts

#### Construction phase

During construction, air quality impacts would be associated with the generation of dust and emissions from stationary and moving on-site machinery and associated vehicular traffic. Particulate emissions would be associated with a number of stationary and mobile sources as well as minor potential for wind erosion of areas of exposed soil. Anticipated sources of dust and dust generating activities include:

- loading and transfer of material from trucks
- excavation activities associated with installation of the new lifts
- kerb modifications and drainage work
- platform regrading.

The Proposal would have a minimal impact on air quality as it would not involve extensive excavation or other land disturbance with the potential to generate significant quantities of dust. Appropriate measures would be established to manage dust emissions from demolition work. The operation of plant, machinery and trucks may also lead to increases in exhaust emissions in the local area, however these impacts would be minor and short-term.

The likely airborne dust load generated during a typical construction day would be small and therefore would be unlikely to result in reduced local air quality at the nearest potentially affected receivers, given the relatively small construction footprint, and with the implementation of proposed control measures.

## **Operation phase**

The Proposal is not anticipated to significantly increase customer traffic to and from the station. However, over the long-term there is anticipated to be an increase in patronage at Canley Vale Station. Increase in patronage at the station is not anticipated to significantly impact air quality in the station area. Overall impacts of air quality during the operation of the Proposal are considered minimal as the Proposal would not result in a significant change in land use.

### **6.10.3 Mitigation measures**

Section 7.2 provides a list of mitigation measures that are proposed to manage air quality issues during construction. They are aimed around maintaining and operating plant and equipment efficiently and implementing measures for dust suppression including watering exposed soil surfaces, covered loads and appropriate management of tracked dirt or mud on vehicles. Such measures would be included in the CEMP to be prepared for the Proposal.

## **6.11 Waste and resources**

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 weeds)
- general waste, including food scraps generated by construction workers.

Waste management would be undertaken in accordance with the WARR Act. A Waste Management Plan would be prepared as part of the CEMP that would identify all potential waste streams associated with the work and outline methods of disposal, reuse and recycling as well as other onsite waste management practices such as keeping areas tidy and free of rubbish.

Waste management targets in accordance with the ISCA IS Rating Scheme v1.2 would be developed for the Proposal and would include reuse and recycling.

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

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

## **6.12 Sustainability**

The design of the Proposal would be based on the principles of sustainability, including aiming for an excellent rating as a program under the ISCA Infrastructure Sustainability Rating Tool

Version 1.2 and the TfNSW Environmental Management System (EMS). These guidelines require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.2.3 for more information regarding the application of these guidelines.

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

### 6.13 Climate change

Changes in the global and regional climate system indicate a need to focus attention on how to adapt and ensure the risks and adaptation options are understood in planning, delivery and operation of infrastructure. The risk and effects of climate change on rail infrastructure in the Sydney region can be assessed in terms of disruptive weather changes such as increased temperatures, wind speeds, rainfall intensity and drought.

Table 16 provides a summary of the main climate risks, potential impacts and proposed adaptation measures based on the Climate Risk Assessment prepared for the Proposal and use the databases Adapt NSW and NARClIM to generate the projections (WSP, 2018). These matters are to be taken into consideration as the design progresses.

**Table 16 Consideration of climate change risks**

Climate variable	Potential impact	Proposed adaptation
Changes to rainfall (droughts and intense rainfall)	<ul style="list-style-type: none"> <li>water (flood) damage to substations and electrical circuitry may result in disruption to electricity supply</li> </ul>	<ul style="list-style-type: none"> <li>detailed design will review the impact of flooding on pits and conduits introduced by the project</li> <li>lift maintenance access is covered and above ground level</li> <li>further flood risk review will occur at Detailed Design;</li> </ul>
	<ul style="list-style-type: none"> <li>localised flooding leading to inundation of drainage infrastructure</li> </ul>	<ul style="list-style-type: none"> <li>further flood risk review will occur at Detailed Design; However, no drainage systems are within scope of works.</li> </ul>
	<ul style="list-style-type: none"> <li>flooding could cause pollutant spills to natural waterways</li> </ul>	<ul style="list-style-type: none"> <li>further flood risk review will occur at detailed design, however no drainage systems are within scope of works.</li> </ul>
	<ul style="list-style-type: none"> <li>decrease in annual total rainfall leading to a reduction in water storages and recue water supplies making it difficult to water landscaping during drought/ heatwaves</li> </ul>	<ul style="list-style-type: none"> <li>if landscape design is introduced at detailed design, then Water Sensitive Urban Design (WSUD) initiatives will be implemented.</li> </ul>

Climate variable	Potential impact	Proposed adaptation
Increase in mean maximum temperature	<ul style="list-style-type: none"> <li>ability to cool critical infrastructure may be effected by extreme heat, leading to system failure or service interruptions</li> <li>select equipment that will be resilient to increased temperature and more frequent and severe heat waves</li> </ul>	<ul style="list-style-type: none"> <li>lifts to include mechanical ventilation.</li> </ul>
	<ul style="list-style-type: none"> <li>protect sensitive assets (e.g. lifts) from the effects of extreme climate and weather</li> </ul>	<ul style="list-style-type: none"> <li>lift maintenance access is covered and above ground level</li> </ul>
	<ul style="list-style-type: none"> <li>increases mean maximum temperature and solar exposure, leading to material degradation and or structural fatigue and greater need for infrastructure maintenance</li> </ul>	<ul style="list-style-type: none"> <li>design would reference TfNSW design life criteria</li> <li>at detailed design, the life of key material elements will be reviewed to be in accordance with requirements and durability assessment</li> <li>the design life of key material elements will be reviewed to be in accordance with relevant requirements and based on Australian Standards</li> </ul>
	<ul style="list-style-type: none"> <li>increase in extreme heat days may result in heat related illness and/or heat stress. Review levels of passengers comfort to take account of Climate Change.</li> </ul>	<ul style="list-style-type: none"> <li>upgrade of the station to be DDA compliant (which in turn) increases passenger comfort for less abled persons and their carers</li> </ul>
increased wind speeds	<ul style="list-style-type: none"> <li>increase in wind speed may impact on the structural integrity of some infrastructure elements</li> </ul>	<ul style="list-style-type: none"> <li>new bridge and lift structure designs shall comply with relevant Australian Standards accounting for wind loadings</li> <li>development of a maintenance manual for new assets introduced by the project, including asset condition inspection cycles</li> </ul>

## 6.14 Greenhouse gas emissions

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

The detailed design process would undertake a compliant carbon footprinting exercise in accordance with TfNSW's *Carbon Estimate and Reporting Tool Manual* (TfNSW, 2017). The carbon footprint would be used to inform decision making in design and construction.

Due to the small scale of the Proposal and the short-term temporary nature of the individual construction work, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Section 7.2.

It is anticipated that, once operational, the Proposal may result in an increase in the use of public transport and a relative decrease in use of private motor vehicles by commuters to travel to and from Canley Vale due to the new interchange facilities such as formalised kiss and ride and new accessible parking. A modal shift in transport usage may reduce the amount of fuel consumed by private motor vehicles with a corresponding relative reduction in associated greenhouse gas emissions in the local area.

## **6.15 Cumulative impacts**

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

A search of the Department of Planning, Industry and Environment's Major Projects Register, Sydney and Regional Planning Panel Development and Planning Register, Fairfield City Council Development Application Register in December 2019 and January 2020 identified that no major development applications are listed in Canley Vale for approval at this time.

Construction work for the Proposal would be coordinated with any other construction activities in the area as required. This would include any work being undertaken by Sydney Trains (such as maintenance), Fairfield City Council, utilities providers or developers.

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

Based on this assessment, it is anticipated that the cumulative impacts would be negligible, with the implementation of consultation with relevant stakeholders and associated mitigation measures in Section 7.2.

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

## 7 Environmental management

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This chapter of the REF identifies how the environmental impacts of the Proposal would be managed through environmental management plans and mitigation measures.

### 7.1 Environmental management plans

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

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

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

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

Other plans to be prepared separately to the CEMP include:

- Community Liaison Management Plan.
- Sustainability Management Plan
- Urban Design Plan

### 7.2 Mitigation measures

Mitigation measures for the Proposal are listed in Table 17. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

**Table 17 Proposed mitigation measures**

No	Mitigation measure	Project Aspect
<b>All Stages</b>		
1.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by TfNSW. This assessment would need to demonstrate the Proposal, as modified, is not likely to significantly affect the environment.	General
<b>Detailed design</b>		
2.	<p>An Urban Design Plan is to be submitted to TfNSW and endorsed by the Precincts and Urban Design team. The Urban Design Plan is to address the fundamental design principles as outlined in 'Around the Tracks' – urban design for heavy and light rail, TfNSW, Interim 2016. The Urban Design Plan shall:</p> <ul style="list-style-type: none"> <li>• Demonstrate a robust understanding of the site through a comprehensive site analysis to inform the design direction, demonstrate connectivity with street networks, transport modes, active transport options, and pedestrian distances</li> <li>• Identify opportunities and challenges</li> <li>• Establish site specific principles to guide and test design options</li> <li>• Demonstrate how the preferred design option responds to the design principles established in 'Around the Tracks', including consideration of Crime Prevention through Environmental Design Principles.</li> </ul> <p>The Urban Design Plan is to include the Public Domain Plan for the chosen option and will provide analysis of the:</p> <ul style="list-style-type: none"> <li>• Landscape design approach including design of pedestrian and bicycle pathways, street furniture, interchange facilities, new planting and opportunities for public art</li> <li>• Materials Schedule including materials and finishes for proposed built work, colour schemes, paving and lighting types for public domain, fencing and landscaping</li> <li>• An Artist's Impression or Photomontage to communicate the proposed changes to the precinct</li> </ul> <p>The following design guidelines are available to assist and inform the Urban Design Plan for the Proposal:</p> <ul style="list-style-type: none"> <li>• TAP Urban Design Plan, Guidelines, TfNSW, Draft 2018</li> <li>• Commuter Car Parks, urban design guidelines, TfNSW, Interim 2017</li> <li>• Managing Heritage Issues in Rail Projects Guidelines, TfNSW, Interim 2016</li> <li>• Creativity Guidelines for Transport Systems, TfNSW, Interim 2016</li> <li>• Water Sensitive Urban Design Guidelines for TfNSW Projects, 2016.</li> </ul>	Landscape and visual amenity
3.	All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to <i>AS 1158 Road Lighting</i> and <i>AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting</i> .	Landscape and visual amenity

No	Mitigation measure	Project Aspect
4.	<p>During detailed design, the following measures would be considered:</p> <ul style="list-style-type: none"> <li>incorporating cultural architectural elements (shapes, materials and colours) into the new structural elements of the station to reflect the local community</li> <li>incorporating cultural motifs (colours, textures) onto the plain, external wall of the station building (facing Railway Parade), to reflect stories/images from the local community</li> <li>incorporate planting (including canopy trees if possible) in the Urban Design Plan, to integrate the new structure, existing vegetation and the setting.</li> </ul>	Landscape and visual amenity
5.	Should the detailed design or onsite works determine the need to remove or trim any additional trees, which have not been identified in the REF, the Construction Contractor would be required to complete TfNSW's Tree Removal Application Form and submit it to TfNSW for approval.	Biodiversity
6.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.	Socio-economic
7.	Detailed design and construction of the Proposal is to be undertaken in accordance with the ISCA Infrastructure Sustainability Rating Scheme (v1.2)	Sustainability, climate change and greenhouse gases
<b>Pre-construction</b>		
8.	A Construction Environmental Management Plan (CEMP) would be prepared by the Construction Contractor in accordance with the relevant requirements of <i>Guideline for Preparation of Environmental Management Plans</i> , Department of Infrastructure, Planning and Natural Resources, 2004) for approval by TfNSW, prior to the commencement of construction and following any revisions made throughout construction.	General
9.	A project risk assessment including environmental aspects and impacts would be undertaken by the Construction Contractor prior to the commencement of construction and documented as part of the CEMP.	General
10.	An Environmental Controls Map (ECM) would be developed by the Construction Contractor in accordance with TfNSW's <i>Guide to Environmental Controls Map</i> (TfNSW, 2019c) for approval by TfNSW, prior to the commencement of construction and following any revisions made throughout construction.	General
11.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.	General
12.	Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on the ECM to avoid direct impacts during construction.	General



No	Mitigation measure	Project Aspect
13.	<p>Prior to the commencement of construction, a Traffic Management Plan (TMP) would be prepared as part of the CEMP and would include at a minimum:</p> <ul style="list-style-type: none"> <li>• ensuring adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised</li> <li>• maximising safety and accessibility for pedestrians and cyclists</li> <li>• ensuring adequate sight lines to allow for safe entry and exit from the site</li> <li>• ensuring access to railway stations, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made)</li> <li>• managing impacts and changes to on and off-street parking and requirements for any temporary replacement provision</li> <li>• parking locations for construction workers away from stations and busy residential areas</li> <li>• routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses</li> <li>• details for rail replacement bus stops if required, including appropriate signage to direct patrons, in consultation with the relevant bus operators. Particular provisions would also be considered for the accessibility impaired</li> <li>• measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the CTMP.</li> </ul> <p>Consultation with the relevant roads authorities would be undertaken during preparation of the CTMP. The performance of all project traffic arrangements must be monitored during construction.</p>	Traffic and Transport
14.	Road Occupancy Licences for temporary road closures would be obtained, where required.	Traffic and Transport
15.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.	Landscape and visual amenity
16.	<p>Prior to commencement of work, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the <i>Interim Construction Noise Guideline</i> (Department of Environment and Climate Change, 2009), <i>Construction Noise and Vibration Strategy</i> (TfNSW, 2018b) and the <i>Noise and Vibration Impact Assessment</i> for the Proposal (SLR, 2019). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.</p>	Noise and vibration

No	Mitigation measure	Project Aspect
17.	<p>The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include:</p> <ul style="list-style-type: none"> <li>• regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise</li> <li>• avoiding any unnecessary noise when carrying out manual operations and when operating plant</li> <li>• ensuring spoil is placed and not dropped into awaiting trucks</li> <li>• avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable</li> <li>• switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded</li> <li>• avoiding deliveries at night/evenings wherever practicable</li> <li>• no idling of delivery trucks</li> <li>• keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site</li> </ul> <p>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</p>	Noise and vibration
18.	<p>The CNVMP would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered, include:</p> <ul style="list-style-type: none"> <li>• maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances</li> <li>• using the most suitable equipment necessary for the construction works at any one time</li> <li>• directing noise-emitting plant away from sensitive receivers</li> <li>• regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc</li> <li>• using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours works</li> <li>• use of quieter and less vibration emitting construction methods where feasible and reasonable.</li> </ul>	Noise and vibration and Non-Aboriginal Heritage
19.	<p>Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory works including jack hammering and compaction for all buildings/structures/roads with a plan distance of 25 metres from the works and all heritage listed buildings and other sensitive structures within 50 metres of the works (unless otherwise determined following additional assessment they are not likely to be adversely affected).</p>	Noise and vibration and Non-Aboriginal Heritage
20.	<p>Affected pre-schools, schools, universities and other identified sensitive receivers are to be consulted in relation to noise mitigation measures to identify any noise sensitive periods, e.g. exam periods. As much as reasonably possible noise intensive construction works in the vicinity of affected educational buildings is to be minimised.</p>	Noise and vibration

No	Mitigation measure	Project Aspect
21.	Where the $L_{Aeq(15\text{minute})}$ construction noise levels are predicted to exceed 75 dBA and/or 30 dBA above the Rating Background Level at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with TfNSW's <i>Construction Noise and Vibration Strategy</i> (TfNSW, 2018b). This would include restricting the hours that very noisy activities can occur.	Noise and vibration
22.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees/vegetation will not be removed as part of the Proposal. Trees to be retained would be protected through temporary protection measures discussed below.	Biodiversity
23.	Tree Protection Zones (TPZs) would be established around trees to be retained. Tree protection would be undertaken in line with <i>AS 4970-2009 Protection of Trees on Development Sites</i> and would include exclusion fencing of TPZs.	Biodiversity
24.	Weed control measures, consistent with TfNSW's <i>Weed Management and Disposal Guideline</i> (TfNSW, 2019a), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the <i>Biosecurity Act 2015</i> .	Biodiversity
25.	Sustainability criteria for the Proposal would be established to encourage the Construction Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.	Sustainability
26.	A Community Liaison Management Plan would be prepared prior to construction to identify all potential stakeholders and best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where practicable.	Socio-economic
27.	Contact details for a 24-hour construction response line, Project Infoline and email address would be provided for ongoing stakeholder contact throughout the construction phase.	Socio-economic
28.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Management Plan to be developed prior to construction.	Socio-economic
29.	Prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the ' <i>Blue Book</i> ' <i>Managing Urban Stormwater: Soils and Construction</i> (Landcom, 2004) and updated throughout construction and regularly inspected (particularly following rainfall events) to ensure ongoing functionality. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and left in place until the works are complete and areas are stabilised.	Soils and water

No	Mitigation measure	Project Aspect
30.	<p>A Waste Management Plan is to be prepared as part of the CEMP to address waste management and would at a minimum:</p> <ul style="list-style-type: none"> <li>• identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities</li> <li>• detail other onsite management practices such as keeping areas free of rubbish</li> <li>• specify controls and containment procedures for hazardous waste and asbestos waste</li> <li>• outline the reporting regime for collating construction waste data.</li> </ul>	Waste and contamination
31.	An appropriate Unexpected Finds Protocol, considering asbestos containing materials and other potential contaminants, would be included in the CEMP. Procedures for handling asbestos containing materials, including licensed contractor involvement as required, record keeping, site personnel awareness and waste disposal to be undertaken in accordance with WorkCover requirements.	Waste and contamination
32.	Hazardous material surveys are to be undertaken for the station to confirm the presence of any potentially hazardous materials.	Waste and contamination
33.	An environmental risk assessment is to be undertaken prior to construction and must include a section on contamination as per the Transport for NSW Standard Requirements.	Waste and contamination
34.	Consult with Sydney Trains, Fairfield City Council and other Stakeholders as relevant, and consider the timing of nearby construction works to minimise potential cumulative impacts.	Cumulative
<b>Inductions</b>		
35.	All construction staff would undergo an induction in the recognition of Aboriginal cultural heritage material. This training would include information such as the importance of Aboriginal cultural heritage material and places to the Aboriginal community, as well as the legal implications of removal, disturbance and damage to any Aboriginal cultural heritage material and sites.	Aboriginal heritage
36.	All workers would be provided with an environmental induction prior to commencing work onsite. This induction would include information on the protection measures to be implemented to protect vegetation, penalties for breaches and locations of areas of sensitivity.	Biodiversity
37.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.	Air quality
<b>Construction</b>		
38.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.	General
39.	Communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site work.	Traffic and transport

No	Mitigation measure	Project Aspect
40.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.	Landscape and visual amenity
41.	During construction, graffiti would be removed in accordance with TfNSW's Standard Requirements.	Landscape and visual amenity
42.	Work would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any work outside these hours may be undertaken if approved by TfNSW and the community is notified prior to these works commencing. An Out of Hours Work application form would need to be prepared by the Construction Contractor and submitted to the TfNSW Environment and Planning Manager for any works outside standard hours.	Noise and vibration
43.	Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.	Noise and vibration
44.	<p>Vibration resulting from construction and received at any structure outside of the Proposal area would be managed in accordance with:</p> <ul style="list-style-type: none"> <li>• for structural damage vibration - German Standard DIN 4150: Part 3 – 1999 Structural Vibration in Buildings: Effects on Structures and British Standard BS 7385-2:1993 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)</li> <li>• for human exposure to vibration the acceptable vibration - values set out in the Environmental Noise Management Assessing Vibration: A Technical Guideline (Department of Environment and Conservation, 2006) which includes British Standard BS 7385-2:1993 Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).</li> </ul>	Noise and vibration
45.	Equipment would be limited to low vibration items (ie non-vibratory rollers) when works are required within 50 m of any heritage structure. This is to be confirmed with site measurements to quantify the site-specific vibration levels. This would be undertaken prior to commencement of the works near any sensitive structures and include operator-attended monitoring.	Noise and vibration and Non-Aboriginal heritage
46.	Attended vibration measurements shall be undertaken at all buildings within 25 m of vibration generating activities when these activities commence to confirm that vibration levels are within the acceptable range to prevent cosmetic building damage.	Noise and vibration and Non-Aboriginal heritage

No	Mitigation measure	Project Aspect
47.	If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in TfNSW's <i>Unexpected Heritage Finds Guideline</i> (TfNSW, 2019b) would be followed, and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the OEH and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and the OEH notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location.	Aboriginal heritage
48.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in TfNSW's <i>Unexpected Heritage Finds Guideline</i> (TfNSW, 2019b) would be followed, and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the TfNSW Project Manager and the TfNSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and OEH. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.	Non-Aboriginal heritage
49.	Construction of the Proposal must be undertaken in accordance with TfNSW's <i>Vegetation Management (Protection and Removal) Guideline</i> (TfNSW, 2019e) and TfNSW's <i>Fauna Management Guideline</i> (TfNSW, 2019f).	Biodiversity
50.	In the event of any tree to be retained becoming damaged during construction, the Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.	Biodiversity
51.	Vehicles and machinery would be properly maintained and routinely inspected to minimise the risk of fuel/oil leaks. Construction plant, vehicles and equipment would also be refuelled offsite, or in a designated refuelling area.	Soils and water
52.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and TfNSW's <i>Chemical Storage and Spill Response Guidelines</i> (TfNSW, 2019g).	Soils and water
53.	Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the TfNSW <i>Chemical Storage and Spill Response Guidelines</i> (TfNSW, 2019g) during the construction phase. All staff would be made aware of the location of the spill kits and be trained in how to use the kits in the case of a spill.	Soils and water

No	Mitigation measure	Project Aspect
54.	In the event of a pollution incident, works would cease in the immediate vicinity and the Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager. The EPA would be notified by TfNSW if required, in accordance with Part 5.7 of the POEO Act.	Soils and water
55.	The existing drainage systems would remain operational throughout the construction phase.	Soils and water
56.	Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the <i>Waste Classification Guidelines</i> (EPA, 2014) and TfNSW's <i>Water Discharge and Reuse Guideline</i> (TfNSW, 2019d).	Soils and water
57.	Air quality management and monitoring for the Proposal would be undertaken in accordance with TfNSW's <i>Air Quality Management Guideline</i> (TfNSW, 2019h).	Air quality
58.	Plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling.	Air quality
59.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.	Air quality
60.	To minimise the generation of dust from construction activities, the following measures would be implemented: <ul style="list-style-type: none"> <li>• apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces)</li> <li>• cover stockpiles when not in use</li> <li>• 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</li> <li>• prevent mud and dirt being tracked onto sealed road surfaces.</li> </ul>	Air quality
61.	All spoil to be removed from site would be tested to confirm the presence of any contamination. Any contaminated spoil would be disposed of at an appropriately licensed facility.	Waste and contamination
62.	All spoil and waste must be classified in accordance with the <i>Waste Classification Guidelines Part 1: Classifying waste</i> (EPA, 2014) prior to disposal.	Waste and contamination
63.	Any concrete washout would be established and maintained in accordance with TfNSW's <i>Concrete Washout Guideline</i> – (TfNSW, 2019i) with details included in the CEMP and location marked on the ECM.	Waste and contamination

## 8 Conclusion

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

The Proposal would provide the following benefits:

- improved and equitable access to Canley Vale Station for customers resulting from installation of lifts, accessible parking and a formalised kiss and ride
- improved station amenity and safety for customers at the station resulting from the installation of the family accessible toilet, ambulant toilets, new lighting and CCTV.

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

- temporary changes to vehicle and pedestrian movements to, from and around the station during construction
- temporary noise and vibration impacts during construction
- impacts to the visual environment due to the inclusion of the lifts and modifications to the footbridge.

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

It is anticipated that these environmental impacts would be suitably managed by the proposed mitigation measures identified in Chapter 7 of this REF and the Conditions of Approval imposed in the Determination Report (to be prepared).

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



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# Appendix A Matters of National Environmental Significance

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

Matters of NES	Impacts
<p><b>Any impact on a World Heritage property?</b> There are no World Heritage properties in the vicinity of the Proposal.</p>	Nil
<p><b>Any impact on a National Heritage place?</b> There are no National Heritage places in the vicinity of the Proposal.</p>	Nil
<p><b>Any impact on a wetland of international importance?</b> There are no wetlands of international importance in the vicinity of the Proposal.</p>	Nil
<p><b>Any impact on a listed threatened species or communities?</b> It is unlikely that the Proposal would significantly affect any threatened species or communities.</p>	Nil
<p><b>Any impacts on listed migratory species?</b> Due to the lack of suitable habitat, it is unlikely that the Proposal would significantly affect any listed migratory species.</p>	Nil
<p><b>Does the Proposal involve a nuclear action (including uranium mining)?</b> The Proposal does not involve a nuclear action.</p>	Nil
<p><b>Any impact on a Commonwealth marine area?</b> There are no Commonwealth marine areas in the vicinity of the Proposal.</p>	Nil
<p><b>Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources?</b> The Proposal is for a transport facility and does not relate to coal seam gas or mining.</p>	Nil
<p><b>Additionally, any impact (direct or indirect) on Commonwealth land?</b> The Proposal would not be undertaken on or near any Commonwealth land.</p>	Nil

## Appendix B Consideration of clause 228

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

Factor	Impacts
<p><b>(a) Any environmental impact on a community?</b></p> <p>There would be some temporary impacts to the community during construction, particularly in relation to noise, traffic, access and visual amenity. Mitigation measures outlined in Section 7.2 would be implemented to manage and minimise adverse impacts.</p>	Minor adverse
<p><b>(b) Any transformation of a locality?</b></p> <p>The Proposal would include the introduction of new visible elements in the landscape (including two new lifts structures). The appearance of the new elements would be consistent with the existing station elements and are considered to be common features in urban areas.</p>	Minor adverse
<p><b>(c) Any environmental impact on the ecosystem of the locality?</b></p> <p>Minimal impacts to trees and vegetation are proposed.</p>	Minor adverse
<p><b>(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</b></p> <p>There would be some temporary impacts during construction particularly in relation to noise, traffic and access and visual amenity.</p>	Minor adverse
<p><b>(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</b></p> <p>The Proposal would have a positive contribution to the locality by creating equitable access to the station and the platform. Non-Aboriginal heritage items are unlikely to be impacted by the Proposal.</p> <p>A desktop archaeological assessment has been undertaken which determined that there is a low risk of encountering archaeological items/deposits and that the Proposal is unlikely to expose historical archaeological relics.</p> <p>The Proposal would contribute to the ongoing use of the station and is considered to have a positive contribution to the locality by creating equitable access to the station.</p>	Minor positive
<p><b>(f) Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)?</b></p> <p>The Proposal is unlikely to have any impact on the habitat of protected fauna.</p>	Negligible
<p><b>(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</b></p> <p>The Proposal is unlikely to have any impact on endangering any species of animal, plant or other form of life, whether living on land, in water or in the air.</p>	Negligible

Factor	Impacts
<p><b>(h) Any long-term effects on the environment?</b> The Proposal is unlikely to have any long-term effects on the environment.</p>	Negligible
<p><b>(i) Any degradation of the quality of the environment?</b> The Proposal is unlikely to have any degradation of the quality of the environment.</p>	Negligible
<p><b>(j) Any risk to the safety of the environment?</b> Provided the recommended mitigation measures are implemented, the Proposal is unlikely to cause any pollution or safety risks to the environment. Specific management measures would be implemented to manage asbestos and other hazardous materials that may be encountered during construction works.</p>	Minor adverse
<p><b>(k) Any reduction in the range of beneficial uses of the environment?</b> The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.</p>	Nil
<p><b>(l) Any pollution of the environment?</b> The Proposal is unlikely to cause any pollution of the environment provided the recommended mitigation measures are implemented.</p>	Minor adverse
<p><b>(m) Any environmental problems associated with the disposal of waste?</b> The Proposal is unlikely to cause any environmental problems associated with the disposal of waste. All waste would be managed and disposed of with a site-specific Waste Management Plan prepared as part of the Construction Environmental Management Plan. Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.</p>	Minor adverse
<p><b>(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</b> The Proposal is unlikely to increase demands on resources that are, or are likely to become, in short supply.</p>	Nil
<p><b>(o) Any cumulative environmental effect with other existing or likely future activities?</b> Cumulative effects of the Proposal are described in Section 6.15, Where feasible, environmental management measures would be co-ordinated to reduce any cumulative construction impacts. The Proposal is unlikely to have any significant adverse long-term impacts.</p>	Negligible
<p><b>(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</b> The Proposal would not affect or be affected by any coastal processes or hazards.</p>	Negligible