



Transport
for NSW

Merrylands Commuter Car Parks

Review of Environmental Factors





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Transport Access Program

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Abbreviations

Term	Meaning
1% AEP	1% Annual Exceedance Probability
1% ARI	1% Average Recurrence Interval
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
APS	Access to Premises (Disability Standards)
ARI	Average Recurrence Interval
ASA	Asset Standards Authority (refer to Definitions)
ASS	Acid Sulfate Soils
BCA	Building Code of Australia
CBD	Central Business District
CCTV	Closed Circuit TV
CEMP	Construction Environmental Management Plan
City of Parramatta Council	New LGA formed in May 2016 which incorporates most of the former Parramatta LGA along with parts of the former Hornsby, Auburn, The Hills and Holroyd LGAs. As a result of council amalgamations, the Proposal site is no longer located within the City of Parramatta Council LGA.
CLM Act	<i>Contaminated Land Management Act 1997 (NSW)</i>
CNS	Construction Noise Strategy
CNVMP	Construction Noise and Vibration Management Plan
CPTED	Crime Prevention Through Environmental Design
CTMP	Construction Transport Management Plan
Cumberland Council	Amalgamation of parts of Parramatta City, Auburn City and Holroyd City councils into the new Cumberland Council. As a result of council amalgamations, the Proposal site is now wholly located within Cumberland Council LGA.
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
D&C	Design and Construct
DDA	<i>Disability Discrimination Act 1992 (Cwlth)</i>

Term	Meaning
DoEE	Commonwealth Department of the Environment and Energy
DP&E	NSW Department of Planning and Environment
DSAPT	<i>Disability Standards for Accessible Public Transport (2002)</i>
DSI	Detailed Site Investigation (Phase II Contamination Investigation)
ECM	Environmental Controls Map
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000 (NSW)</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)</i>
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
FM Act	<i>Fisheries Management Act 1994 (NSW)</i>
Heritage Act	<i>Heritage Act 1977 (NSW)</i>
Holroyd City Council	Former LGA. In May 2016 the State Government of NSW announced the merger of most of the former Holroyd Council area into Cumberland Council. As a result of council amalgamations, the Proposal site is now wholly located within Cumberland Council LGA.
HV	High Voltage
ICNG	<i>Interim Construction Noise Guideline (Department of Environment and Climate Change, 2000).</i>
Infrastructure SEPP	<i>State Environmental Planning Policy (Infrastructure) 2007 (NSW)</i>
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
LV	Low Voltage
NES	National Environmental Significance
Noxious Weeds Act	<i>Noxious Weeds Act 1993 (NSW)</i>
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>

Term	Meaning
NSW	New South Wales
NVIA	Noise and Vibration Impact Assessment
OEH	NSW Office of the Environment and Heritage
OHWS	Overhead Wire Structure
OOHW	Out of hours works
ONVIA	Operational Noise and Vibration Assessment
PASS	Potential Acid Sulfate Soils
PDP	Public Domain Plan
POEO Act	<i>Protection of the Environment Operations Act 1997 (NSW)</i>
RailCorp	(former) Rail Corporation of NSW
RAP	Remediation Action Plan
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Roads Act	<i>Roads Act 1993 (NSW)</i>
Roads and Maritime	NSW Roads and Maritime Services (formerly Roads and Traffic Authority)
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
SoHI	Statement of Heritage Impact
TCP	Traffic Control Plan
TfNSW	Transport for NSW
TGSI	Tactile Ground Surface Indicators (“tactiles”)
TT&AIA	Traffic, Transport and Access Impact Assessment
TMP	Traffic Management Plan
TPZ	Tree Protection Zone
TSC Act	<i>Threatened Species Conservation Act 1995 (NSW)</i>
UDP	Urban Design Plan
VIA	Visual Impact Assessment
WARR Act	<i>Waste Avoidance and Resource Recovery Act 2001 (NSW)</i>

Definitions

Term	Meaning
Average Recurrence Interval	The likelihood of flood occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100-years.
Annual Exceedance Probability	The probability that a given rainfall total accumulated over a given duration will be exceeded in any one year. – i.e. there is a 1% chance of a flood of this size or greater occurring in any given year.
Asset Standards Authority	The ASA is an independent body within TfNSW, responsible for engineering governance, assurance of design safety, and ensuring the integrity of transport and infrastructure assets. Design Authority functions formerly performed by RailCorp are now exercised by ASA.
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the Contractor (should the Proposal proceed) to a design suitable for construction (subject to TfNSW acceptance).
Design and Construct Contract	A method to deliver a project in which the design and construction services are contracted by a single entity known as the Contractor. The Contractor completes the Proposal by refining the concept design presented in the REF and completing the detailed design so that it is suitable for construction (subject to TfNSW acceptance). The Contractor is therefore responsible for all work on the Proposal, both design and construction.
Detailed design	Detailed design broadly refers to the process that the Contractor undertakes (should the Proposal proceed) to refine the concept design to a design suitable for construction (subject to TfNSW acceptance).
Disability Standards for Accessible Public Transport	The Commonwealth <i>Disability Standards for Accessible Public Transport 2002</i> (“Transport Standards”) (as amended) are a set of legally enforceable standards, authorised under the Commonwealth <i>Disability Discrimination Act 1992</i> (DDA) for the purpose of removing discrimination ‘as far as possible’ against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Ecologically Sustainable Development	As defined by clause 7(4) Schedule 2 of the EP&A Regulation. Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.
Feasible	A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.
Interchange	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.

Term	Meaning
Noise sensitive receiver	In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (e.g. schools, TAFE colleges), health care facilities (e.g. nursing homes, hospitals), recording studios and places of worship/religious facilities (e.g. churches).
Out of hours works	Defined as works <i>outside</i> standard construction hours (i.e. outside of 7am–6pm Monday to Friday, 8am–1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Part 5 of the EP&A Act - in this instance, TfNSW.
Rail possession	Possession is the term used by railway building/maintenance contractors to indicate that they have taken possession of the track (usually a block of track) for a specified period, so that no trains operate for a specified time. This is necessary to ensure the safety of workers and rail users.
Reasonable	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
Sydney Trains	From 1 July 2013, Sydney Trains replaced CityRail as the provider of metropolitan train services for Sydney.
Tactiles	Tactile tiles or Tactile Ground Surface Indicators (TGSIs) are textured ground surface indicators to assist pedestrians who are blind or visually impaired. They are found on many footpaths, stairs and train station platforms.
The Proposal	The construction and operation of the Merrylands Commuter Car Parks.
Vegetation Offset Guide	<p>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 111 of the EP&A Act.</p> <p>The Guide provides generally for planting of a minimum of eight trees for each large tree with a diameter at breast height (DBH) of more than 60 cm, four trees where the DBH is 15-60 cm, or two trees where DBH is less than 15 cm.</p>

Executive summary

Overview

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

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

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 Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Description of the Proposal

The Proposal would provide 85 additional commuter parking spaces in the vicinity of Merrylands Station at two sites as follows:

- provision of a new multi-deck structure over the existing car park adjacent to the station (Site 1) to provide approximately 65 additional commuter car parking spaces. This would consist of:
 - alterations to the existing below-ground car park (referred to as Level 1) and the addition of a new level at the same grade as the bus interchange (referred to as Level 2)
 - provision of two partial split levels off Levels 1 and 2 (referred to as Levels 1A and 2A)
- the Proposal would not preclude the development of two additional levels on the car park in the future and does not preclude alternative parking solutions in other areas of Merrylands.
- provision of 20 additional parking spaces along Railway Terrace, around 300 metres to the north of the station (Site 2), with connection to the station via new and existing footpaths.

Sites 1 and 2 are shown on Figure 4.

Subject to approval, construction is expected to commence in early 2017 and take around 12 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF.

Need for the Proposal

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

The upgrades are 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.

The Proposal fulfils the program objectives by proposing to provide:

- additional commuter parking spaces for Merrylands Station
- improved customer facilities including upgraded and accessible parking spaces, and improved access to the station.

The Proposal would also ensure that Merrylands Station would meet legislative requirements under the *Disability Standards for Accessible Public Transport* (DSAPT).

The Proposal is also consistent with planning strategies in NSW, including *NSW 2021 – Making NSW Number One* (Department of Premier and Cabinet, 2011) and the *NSW Long Term Transport Master Plan* (TfNSW, 2012a).

Design options considered

A Concept Design Report for Merrylands Station (Arup, 2015) identified that existing car parking for commuters at Merrylands Station is at capacity. Several sites were investigated for provision of additional commuter car parking.

The Concept Design Report identified multiple options for the location and design of the car parks:

- Option 1 – Multi-storey car park at Terminal Place
- Option 2 – Multi-storey car park Albion Street
- Option 3A – At-grade car park on Railway Terrace north of the railway station
- Option 3B – At-grade car park on Railway Terrace south of the railway station

Option 1 originally involved construction of a single deck over the existing Council commuter car park at the station, utilising some RailCorp operational land. Following the tender process, this design has been refined to three additional part decks.

Option 2 involved the purchase of four single dwelling houses to create a site on the eastern side of the station.

Option 3 included two variations, comprising angle or 90 degree parking in the road reserve in areas north (3A) and south (3B) of the railway station, respectively. The southern section (Option 3B) was more constrained, involving both the Cumberland Council road reserve and RailCorp land, with limited width and rail signal cabling requiring relocation, thus adding to the cost.

Options 1 and 3A were selected as the preferred option (the Proposal) using a multi-criteria assessment.

The preferred sites were then developed into the Proposal.

Statutory considerations

The Environmental Planning and Assessment Act (EP&A Act) provides for the environmental impact assessment of development in NSW. Part 5 of the EP&A Act generally specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as TfNSW, which do not require development consent under the EP&A Act.

The *State Environmental Planning Policy (Infrastructure) 2007* (the Infrastructure SEPP) is the primary environmental planning instrument relevant to the proposed development and is the

key environmental planning instrument which determines that this Proposal is permissible without consent and therefore is to be assessed under Part 5 of the EP&A Act.

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 Part 5 of the EP&A Act). Clause 78 defines '*rail infrastructure facilities*' as '*associated public transport facilities for railway stations*' which, under Clause 5, includes '*car parks intended to be used by commuters*'.

As TfNSW is a public authority and the proposed activity falls within the definition of rail infrastructure facilities under the Infrastructure SEPP, the Proposal is permissible without consent. Consequently the environmental impacts of the Proposal have been assessed by TfNSW under Part 5 of the EP&A Act.

This REF has been prepared to assess the construction and operational environmental impacts of the Proposal. The REF has been prepared in accordance with clause 228 of the *Environment Planning and Assessment Regulation 2000* (the EP&A Regulation).

In accordance with section 111 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 proposed activity.

Chapter 6 of this REF presents the environmental impact assessment for Merrylands Commuter Car Parks, in accordance with these requirements.

Community and stakeholder consultation

Under the Infrastructure SEPP, consultation is required with local councils or public authorities in certain circumstances, including where Council-managed infrastructure is affected. Consultation has been undertaken with the former Holroyd City Council and the City of Parramatta Council during the development of design options and the preferred option. Consultation with these stakeholders would continue through the detailed design and construction of the Proposal.

TfNSW is also proposing to undertake the following consultation for the Proposal:

- direct notification to community stakeholders
- public display of the REF.

Community consultation activities for the Proposal would be undertaken during the public display period of this REF. 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, the REF would also be available for viewing at the Merrylands Central Library on the corner of Miller and Newman Streets in Merrylands, the former Holroyd City Council Customer Service Centre (now Cumberland Council) at 16 Memorial Avenue in Merrylands, and Transport for NSW, Zenith Centre, L5, Tower A, 821 Pacific Highway Chatswood. The REF would also be available to download from the [TfNSW website](http://www.transport.nsw.gov.au/projects-tap)¹ and a Project Infoline (1800 684 490) 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.

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

Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure 1 presents an overview of the consultation and planning process and the current status of the Proposal.



Figure 1 Planning approval and consultation process for the Proposal

Environmental impact assessment

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

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

- temporary loss of parking during construction
- temporary noise and vibration impacts during construction

- temporary dust and visual impacts
- minor delays on the adjacent road network during construction
- temporary changes to access arrangements (including pedestrian diversions) during construction
- removal of vegetation on the sites
- introduction of new elements into the visual landscape – new lift shaft and parking deck, and new at-grade parking spaces
- a slight increase in local traffic movements.

Longer term benefits of the Proposal include provision of additional commuter parking spaces, improved accessibility to the station and improved interchange facilities.

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

Conclusion

This REF has been prepared having regard to sections 111 and 112 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 *NSW Sustainable Design Guidelines – Version 3.0* (TfNSW, 2013a) 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.

1 Introduction

Transport for NSW (TfNSW) was established in 2011 as the lead agency for integrated delivery of public transport services across all modes of transport in NSW. TfNSW is the proponent for the Merrylands Commuter Car Parks (the Proposal), to be delivered by the Infrastructure and Services Division.

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

The NSW Government is committed to facilitating and encouraging the use of public transport, such as trains, by making stations more accessible, providing and upgrading car parks, and improving interchanges around stations with other modes of transport such as cars and bicycles.

Merrylands Station is currently the 50th busiest railway station in the rail network with approximately 10,500 customer trips recorded at the station on an average weekday. This is predicted to increase to 20,665 trips per day by 2036. This represents an increase in the order of 96% with associated increases in the demand for on-street and off-street commuter parking.

Inadequate parking may deter customers from using public transport and the Proposal has been planned to help address current and potential future demand for parking at Merrylands Station. The Proposal would provide an additional 85 spaces, subject to detailed design and approval, and would support the growth in public transport use for existing and future users of the station.

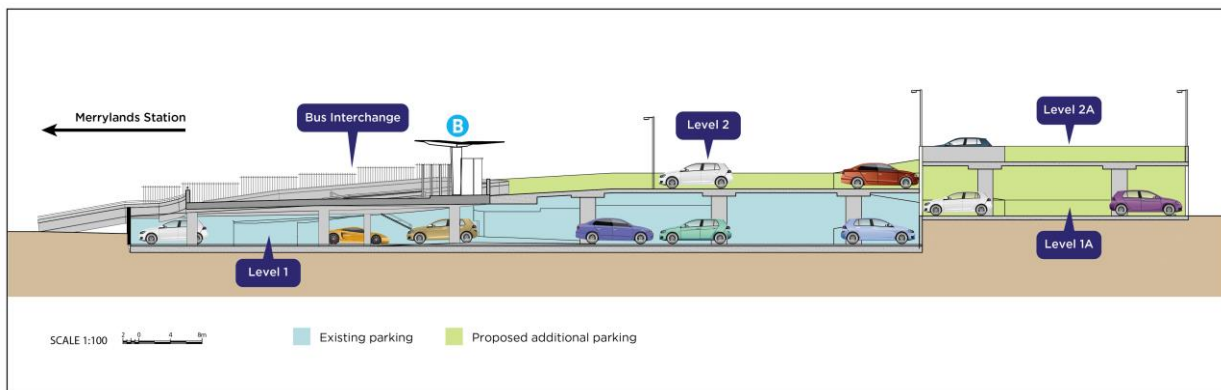
1.1.2 Key features of the Proposal

The Proposal is located in the suburbs of Merrylands and Granville, and involves the construction of a new multi deck structure over the existing car park adjacent to Merrylands Station (Site 1), and construction of ground level parking spaces along Railway Terrace, Granville (Site 2), north of the railway station.

Site 1 (see Figure 2) would include provision of a new multi-deck structure over the existing car park structure with sufficient height to provide access to existing easements including:

- alterations to the existing below-ground level car park (referred to as Level 1) and the addition of a new level at the same grade as the bus interchange (referred to as Level 2)
- provision of two partial split levels off Levels 1 and 2 (referred to as Levels 1A and 2A)
- provision of approximately 220 parking spaces (approximately 65 new) including six accessible car parking spaces in accordance with DDA requirements
- maintenance of the existing timed Council parking spaces
- vehicular exit and entrance from Terminal Place (as current)
- provision of a new lift from the car park to the Merrylands Station entry plaza. (approximately 29 parking spaces on Levels '1A' and '2A' would have stair access only)

- new retaining wall on the eastern side of the car park
- partial removal and relocation of a metal fence along the railway adjacent to rail tracks
- partial removal of an existing pedestrian ramp to be converted into a landscaped area
- potential inclusion of mechanical ventilation (subject to detailed design)
- ancillary works, including services diversion and/or relocation, station power supply upgrade, ventilation, minor drainage works, adjustments to lighting, installation of handrails and balustrades, improvements to station communication systems with new infrastructure (including additional CCTV cameras), and adjustments to wayfinding signage



Note: Within the appendices, the following terms are used:

Level 1 – “Lower ground level”

Level 2 – “Ground level”

Level 1A – “Mid lower ground level”

Level 2A – “Mid upper ground level”

Figure 2 Diagram indicating car park levels

The Proposal would not preclude the development of two additional levels on the car park in the future and does not preclude alternative parking solutions in other areas of Merrylands. Any further extension of the car park would be subject to a separate environmental impact assessment.

Site 2 would include:

- construction of 24 parking spaces (20 new) configured as 90-degree spaces along Railway Terrace
- new concrete shared path linking to the existing shared pathways
- ancillary works including services diversion and/or relocation, minor drainage works, adjustments to lighting, and adjustments to wayfinding signage.

Subject to planning approval, construction is expected to commence in early 2017 and take about 12 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this Review of Environmental Factors (REF).

Figures 9 and 11 indicate proposed site layouts for the car parks.

1.2 Location of the Proposal

The Proposal is located in the suburb of Merrylands around 20 kilometres west of the Sydney Central Business District (CBD) within the Local Government Area (LGA) of the former Holroyd and Parramatta LGAs (now Cumberland LGA). The location of the Proposal in the regional context is shown in Figure 3.

The Proposal is located adjacent to Merrylands Station and the railway corridor. Site 1 is located on Lot 1 DP 209516 (owned by Cumberland Council) and Lot 11 DP 1200381 (owned by RailCorp). Site 2 is located within the road reserve of Railway Terrace which is under the care and control of Cumberland Council.

The railway station is located on the T2 Inner West and South Line and the T5 Cumberland Line and provides services to western Sydney and the Sydney CBD.

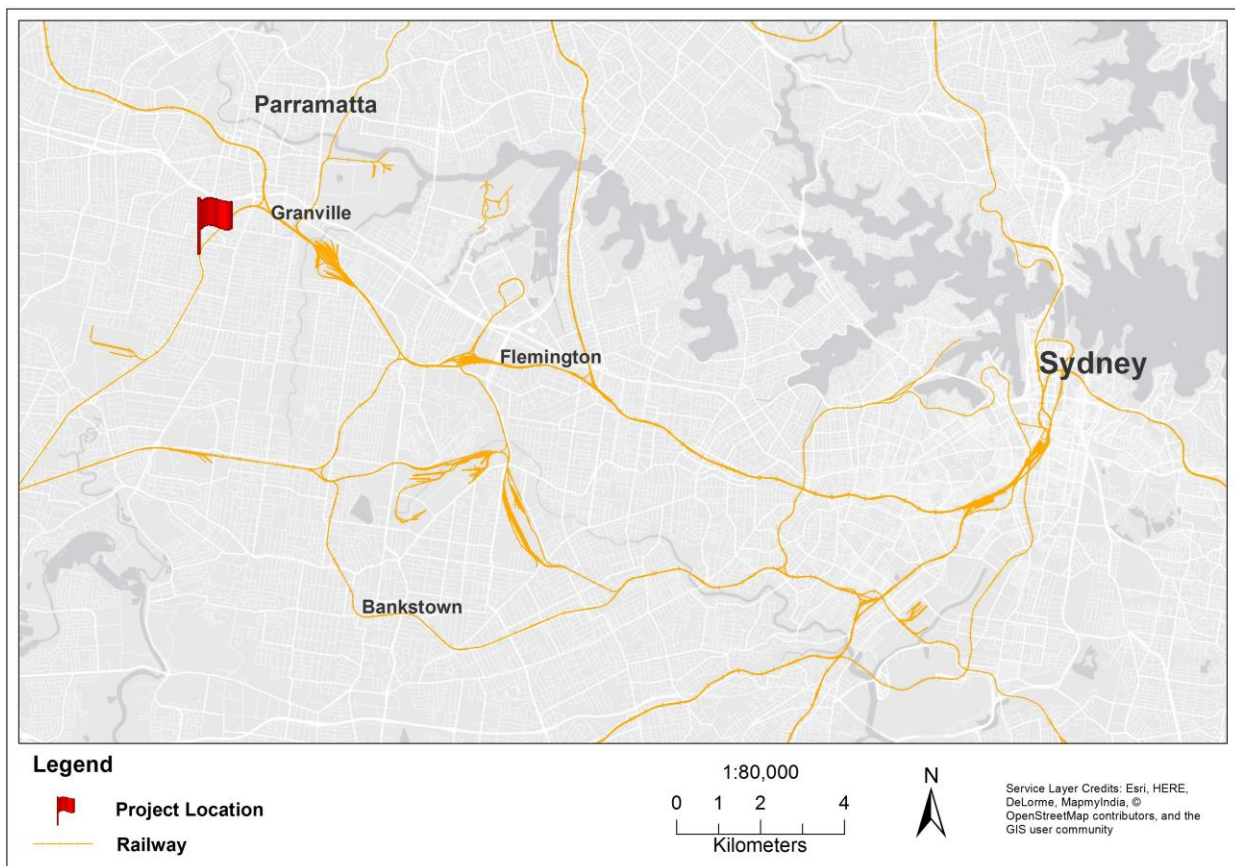


Figure 3 Regional context

1.3 Existing infrastructure and land uses

The Proposal is located in the vicinity of Merrylands Station.

Key existing features of Site 1 are as follows:

- the site is bound to the east by the rail corridor and to the west by Terminal Place. To the north of the site is commercial development. Directly south of the site is the Merrylands Station.
- Merrylands Railway Station Building is listed on Schedule 5 (Environmental Heritage) of the Holroyd Local Environmental Plan (Holroyd LEP) 2013 and on the RailCorp Section 170 Heritage and Conservation Register

- one portion of the site is currently occupied by an at-grade public car park (below ground level) owned and operated by Cumberland Council, and the remainder is commuter car parking on RailCorp property. The car park currently provides a total of 155 parking spaces.
- vehicles enter and exit the existing car park from Terminal Place
- there are four trees located at the boundary of Site 1
- land uses surrounding the site consist of rail corridor, railway station, commercial/industrial and transport infrastructure (roads and bus interchange)
- pedestrian access is via an existing pathway through the bus interchange to the station entrance, with a portion of this route under the cover of the bus shelter canopy
- the site is classified as a medium risk area for the 1% AEP flood event.

Key existing features of Site 2 are as follows:

- the site is bound to the west by rail corridor and to the east by Railway Terrace. The Neil Street rail overpass is located just south of the site.
- the site is located within Cumberland Council road reserve
- the site consists of a grassed area
- the site provides four existing parallel at-grade parking spaces
- pedestrian access is via an existing pathway directly adjacent to the railway corridor on Railway Terrace, which is around 300 metres from the north end of the at-grade access to the station entrance
- the site is classified as a medium risk area for the 1% AEP flood event.

Key features of the study area are shown in Figure 4. Photographs of the study area are provided in Figure 5 to Figure 8.



Figure 4 Site locality map



Figure 5 View of the existing lower ground car park (Site 1) from the station plaza looking north (bus interchange on the left)



Figure 6 View of existing car park entry (Site 1) from Terminal Place (bus interchange to the right)



Figure 7 View looking north on Railway Terrace towards Site 2



Figure 8 Area to be used for car park Site 2 looking south towards Merrylands Station

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by TfNSW to assess the potential impacts of the Merrylands Commuter Car Parks. For the purposes of these works, TfNSW is the proponent and the determining authority under Part 5 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 111 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 relevant provisions of other relevant environmental legislation, including the *Threatened Species Conservation Act 1995* (TSC 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 Environment for any necessary approvals under the EPBC Act. Refer to Chapter 4 for more information on statutory considerations.

2 Need for the Proposal

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

2.1 Strategic justification

2.1.1 Overview

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

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

The Proposal is consistent with the NSW Government's commitment to develop and invest in transport infrastructure as detailed in *State Priorities – NSW: Making It Happen* (NSW Government, 2015).

State Priorities – NSW: Making It Happen is the NSW Government's plan to guide resource allocation and investment in NSW.

One of the 12 priorities identified as part of *State Priorities – NSW: Making It Happen* relates to investment in building infrastructure. The ongoing development and investment in transport infrastructure is identified as part of the wider building infrastructure priority.

The NSW Government has developed a *Long Term Transport Master Plan* (TfNSW, 2012a). This plan provides a comprehensive strategy for all modes of transport across NSW over the next 20 years, while also delivering on current commitments.

Data forecasts indicate that there would be significant growth in population and employment from 2006 up to 2036 in the area within the station catchment. The Proposal accommodates the forecast Sydney Trains patronage growth (+15 per cent to 2036) and changing travel patterns.

The *Disability Action Plan 2012-2017* (TfNSW, 2012b) was developed by TfNSW, in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing organisations within NSW. The Plan discusses the challenges, the achievements to date, the considerable undertaking that is required to finish the job and provide a solid and practical foundation for future progress over the next five years. The Proposal has been developed in consideration of the objectives outlined in this Plan.

Public transport is viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal. Further details of the application of NSW Government policies and strategies are discussed in Section 4 of this REF.

2.1.2 Objectives of the Transport Access Program

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

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

2.1.3 Objectives of the Proposal

The specific objectives of the Proposal are to:

- increase the designated area for commuters to park by developing site/s within close walking distance of Merrylands Station and bus interchange to provide additional commuter car parking spaces
- respond to the needs of a growing regional population and promote increased use of public transport by increasing convenience and accessibility to and from Merrylands Station
- integrate the commuter car park into existing roads and pathways to facilitate safe and efficient movement of pedestrians and vehicles within and around the proposed commuter car park
- provide car parks that are accessible to those with a disability, the ageing and parents/carers with prams.

2.2 Design development

Arup was engaged by TfNSW to develop a Concept Design (Arup, 2015) for additional commuter car parking that would improve accessibility to Merrylands Station, encourage the use of public transport and meet key architectural, urban and engineering objectives. Following a design and construct tender process; the design was refined by the preferred contractor as per Figure 10.

Merrylands Station is currently the 50th busiest railway station in the rail network with approximately 10,500 customer trips recorded at the station on an average weekday. Station patronage is predicted to increase by 96% by 2036.

The survey of the local area in 2014 identified a total of 630 parking spaces available to commuters, including 209 on-street spaces.

The Proposal would provide an additional 85 spaces, subject to detailed design and approval, and would support the growth in public transport use for existing and future users of the station.

These needs and opportunities for Merrylands Station were considered in the development of options for the concept design (refer to Section 2.3).

2.3 Alternative options considered

Investigations were undertaken to identify the potential location for additional commuter car parking near Merrylands Station. A Concept Design Report for commuter car parking at Merrylands Station (Arup, 2015) identified multiple options for the location and design of the car parks:

- Option 1 – Multi-storey car park at Terminal Place
- Option 2 – Multi-storey car park at Albion Avenue
- Option 3A – At-grade car park on Railway Terrace north of the railway station
- Option 3B – At-grade car park on Railway Terrace south of the railway station.

Option 1 involved construction of a single level over the existing Council timed/commuter car park at the station, utilising some RailCorp operational land. Following the tender process this option has been refined to three additional part decks.

Option 2 involved the purchase of four single dwelling houses to create a car park on the eastern side of the station.

Option 3 included two variations, comprising angle or 90 degree parking in the road reserve in areas north (3A) and south (3B) of the railway station, respectively. The southern section (Option 3B) was more constrained, involving both Council road reserve and RailCorp land, with limited width and rail signal cabling requiring relocation.

A detailed breakdown of the options is outlined in Table 1 with supporting justification for the preferred option provided in Section 2.4.

Table 1 Description of alternative car park options considered

Option	Description and analysis
Option 1 Multi-storey car park in Terminal Place	A multi-storey car park would be provided around 50m from the railway station. The Site is an existing public timed/untimed commuter car park located on Council and RailCorp land. Approximately 65 new car spaces would be provided. A new car park deck would be built over the existing car park, adjacent to the bus interchange. The option requires use of RailCorp operational land.
Option 2 Multi-storey car park Albion Avenue	A multi storey car park would be provided including a retail component around 90m from the railway station. The site is located on four existing private residential properties. Approximately 324 new car spaces would be provided. The option requires purchase and demolition of four private dwellings. Final design would be a large car park overshadowing low density residential dwellings.

Option	Description and analysis
Option 3A At-grade car park on Railway Terrace north	At-grade car parking would be provided around 300m north of the railway station The site is located on Council road reserve. Approximately 80 angle new car spaces would be provided if the whole site were able to be used. The option required relocation of a shared path and RailCorp corridor cabling. The option did not require removal of any trees.
Option 3B At-grade car park on Railway Terrace south	At-grade car parking would be provided approx. 200m south of the railway station The site is located on Council road reserve and RailCorp land. Approximately 50 new car spaces would be provided. The option required relocation of a shared path. The option required removal of four trees.

In relation to Option 2, the high cost of property acquisition for the block between Sutherland Lane and Albion Avenue which is zoned R4 High Density Residential, was considered prohibitive.

Option 3A was refined to remove the impact of relocating fibre optic and signal cabling, and was reduced in scope to north of the Neil Street overpass. Car park numbers to be provided were therefore reduced to 20 new spaces (totalling 24).

Option 3B was discounted as it required the relocation of signals and communications cables as well as optic fibre cable.

Major telecommunication cable ducts are located in the north western footpath of Railway Terrace adjacent to the RailCorp boundary fence. There is little if any opportunity to adjust these major fibre optic cables.

2.3.1 The 'do-nothing' option

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

Under a 'do-nothing' option, commuter car parking at Merrylands Station would remain constrained.

The 'do nothing' option would not address the pressure for commuter car parking in the area, potentially limiting the use and investment in public transport and adding to vehicular kilometres travelled by increased car trips for commuter journeys.

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

2.4 Justification for the preferred option

The concept design options were assessed against a range of criteria including customer experience outcomes, constructability, land-use integration, safety and security, engineering constraints, cost and environmental impacts.

A Multi Criteria Assessment was undertaken and a combined approach involving Options 1 and 3A were selected, as these options help provide for future commuter car parking demands with less community impact and costs.

These options were chosen as Option 1 utilises RailCorp land and involves a comparatively minor change in land use as the site is already dedicated to commuter parking. Option 3A north of the station along Railway Terrace is relatively free of obstacles and utilises the Railway Terrace road reserve, and presents less constructability issues.

3 Description of the Proposal

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

3.1 The Proposal

The Proposal would provide 85 additional commuter parking spaces in the vicinity of Merrylands Station at two sites as follows:

- provision of a new multi-deck structure over the existing car park adjacent to the station (Site 1) to provide approximately 65 additional commuter car parking spaces. The proposed car park at Site 1 would provide a total of 220 car parking spaces, compared with the existing car park which provides 155 spaces. This is a net increase of approximately 65 untimed commuter car parking spaces
- provision of 20 additional parking spaces along Railway Terrace, around 300 metres to the north of the station (Site 2), with connection to the station via new and existing footpaths.

Site 1 would include:

- alterations to the existing below-ground level car park (referred to as Level 1) and the addition of a new level at the same grade as the bus interchange (referred to as Level 2)
- provision of two partial split levels off Levels 1 and 2 (referred to as Levels 1A and 2A).
- provision of approximately 220 parking spaces (65 new) including six accessible car parking spaces in accordance with DDA requirements
- maintenance of the existing timed Council parking spaces
- vehicular exit and entrance from Terminal Place (as current)
- provision of a new lift from the car park to the Merrylands Station entry plaza (approximately 29 parking spaces on Levels '1A' and '2A' would have stair access only)
- new retaining wall on the eastern side of the car park
- potential inclusion of mechanical ventilation (subject to detailed design).

Site 2 would include:

- construction of 24 parking spaces (20 new) configured as 90-degree spaces along Railway Terrace
- new concrete shared path linking to the existing shared pathways
- ancillary works including services diversion and/or relocation, minor drainage works, adjustments to lighting, and adjustments to wayfinding signage.

Figure 10 show the general layout of key elements for Site 1. Figure 11 shows a plan view of Site 2, including key elements.

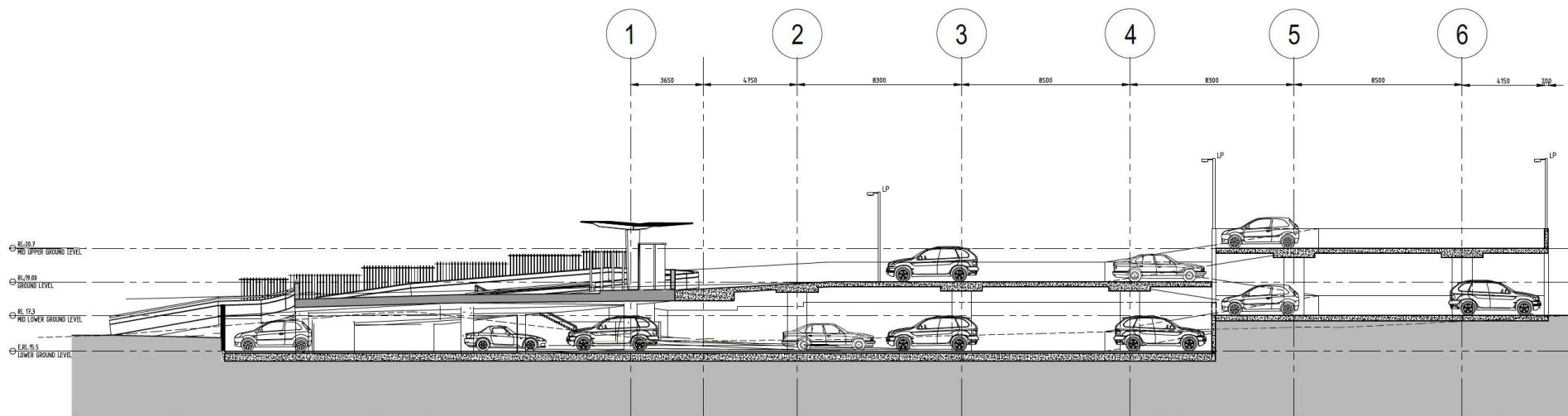
FLOORS	CLASS 2 CAR SPACE	SMALL CAR SPACE	DISABLED SPACE	TOTAL
LEVEL 2(FUTURE)	46	0	0	46
LEVEL 1(FUTURE)	46	0	0	46
UNDER GROUND	57	0	0	57
LOWER GROUND	156	1	6	163
TOTAL	213	1	6	220



LOWER GROUND FLOOR PLAN 01
SCALE 1:200

Note: Yellow shading indicates significant new works

Figure 9 Key elements of the Proposal (Site 1) (Indicative only, subject to detailed design)



SECTION 01
 SCALE 1:100 TAP-1655-000010

Figure 10 Sections of the Proposal (Site 1) *(Indicative only, subject to detailed design)*



LEGEND		PROPOSED
	EXTENT OF WORKS	
	K&G	KERB AND GUTTER
		STORMWATER LINE

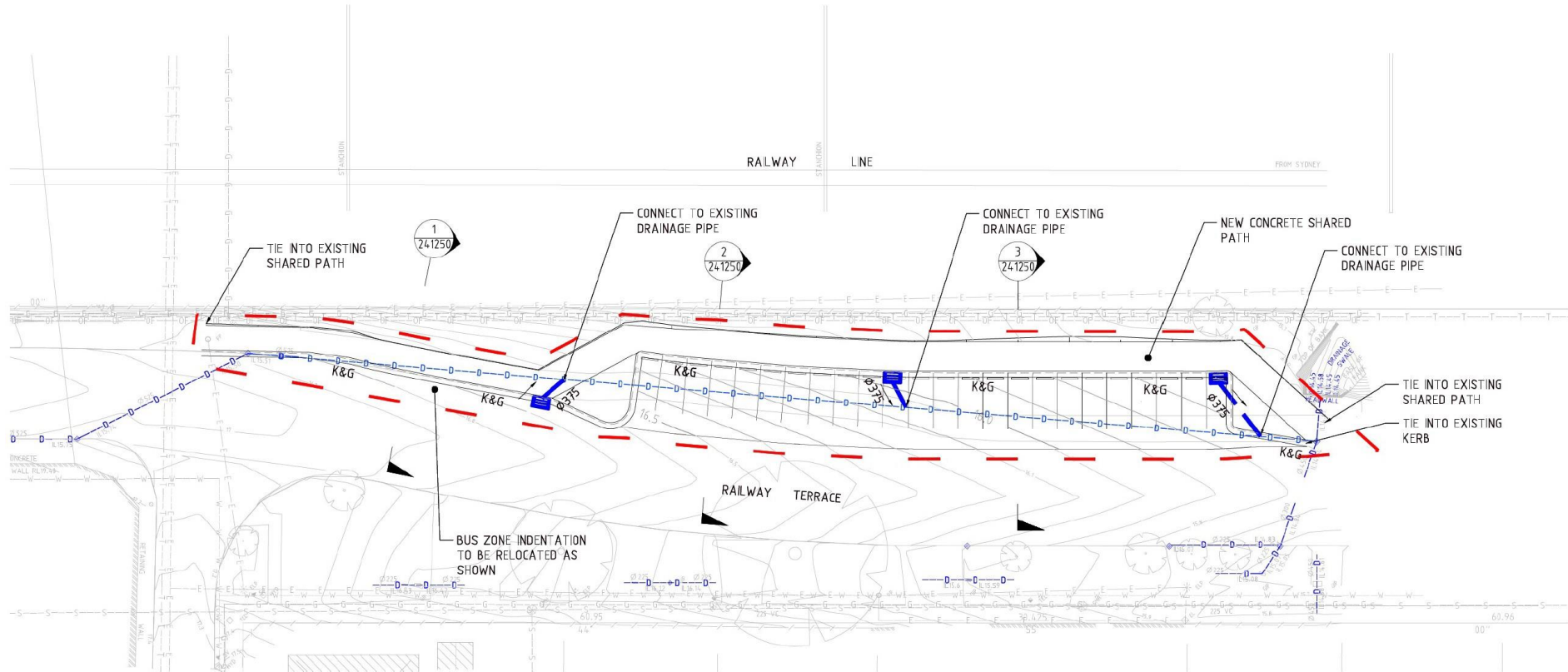


Figure 11 Key elements of the Proposal (Site 2) (Arup, 2015 - Indicative only, subject to detailed design)

3.1.1 Design features

Commuter car park (Site 1)

Details of the proposed works to increase commuter parking capacity and improve accessibility and customer service include:

- approximately 65 additional car spaces within the reconstructed car park
- height clearances to provide access to existing easements
- continued use of existing access, plus provide new access
- resurface and re linemark a portion of existing car park
- new level at the same grade as the bus interchange
- new lift to provide access from Level 1 to the station plaza
- new floor slabs for split levels 1A and 2A, with level 2A approximately 5.2m above Level 1
- vehicle access via:
 - a new access ramp located adjacent to the current down ramp that provides access to the existing car park located on the site. This up ramp will allow for one-way movements only.
 - a down ramp provided in the southern corner of the new car park level, with access into the existing ground level car park via a one-way ramp
 - new ramps between split levels 1A and 2A
- new stairs between split levels 1A and 2A
- new retaining wall on the eastern side of the car park
- new fence along the north east and south east boundaries, compliant with TfNSW standards
- partial removal of an existing pedestrian ramp to be converted into a landscaped area
- potential mechanical ventilation (subject to detailed design)
- ancillary works, including services diversion and/or relocation, station power supply upgrade, ventilation, minor drainage works, adjustments to lighting, installation of handrails and balustrades, improvements to station communication systems with new infrastructure (including additional CCTV cameras), and adjustments to wayfinding signage.

Commuter car park (Site 2)

Details of the proposed works to increase commuter parking capacity and improve accessibility and customer service include:

- 90 degree car parking (approximately 20 new spaces)
- new concrete shared path linking to the existing shared pathways
- ancillary works including services diversion and/or relocation, minor drainage works, adjustments to lighting, and adjustments to wayfinding signage.

Materials and finishes

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

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

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

- lift – precast concrete with a steel frame and fully glazed glass
- suspended slabs i.e. reinforced and prestressed concrete slabs with a slip resistant finish to minimise wheel squeal
- columns, walls and stairs – reinforced concrete with anti-graffiti paint
- kerbs and gutters – to match existing local council infrastructure
- footpaths – concrete non-slip textured finish.

The design would be submitted to TfNSW's Urban Design and Sustainability Review Panel at various stages for comment before being accepted by TfNSW. An Urban Design Plan (UDP) and Public Domain Plan (PDP) would also be prepared by the Contractor, prior to finalisation of detailed design for endorsement by TfNSW. It is noted that the materials and colours shown on the architectural drawings, artists' impressions and photomontages within this REF are indicative at this stage, and are subject to detailed design.

3.1.2 Engineering constraints

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

Existing structures: the placement and integrity of existing structures was considered during the development of the design – these structures include the existing interchange, the heritage-listed Merrylands Railway Station Building, the existing station plaza, and other existing station buildings.

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.

Other considerations:

- the heritage listed Merrylands Railway Station Building is in close proximity to the proposed footprint
- both sites are within an area mapped by the former Holroyd City Council (now Cumberland Council) as within the 1% AEP flood area
- the contractor would be required to determine upstream catchments for hydrological assessment to inform any potential flood impacts and stormwater drain design along boundary
- the condition and capacity of the existing stormwater system would be assessed at detailed design

- hydraulic modelling of proposed drainage network would be undertaken at detailed design.

3.1.3 Design standards

The Proposal would be designed having regard to the following:

- *Disability Standards for Accessible Public Transport 2002* (issued under the Commonwealth *Disability Discrimination Act 1992*)
- Building Code of Australia
- relevant Australian Standards
- Asset Standards Authority standards
- Sydney Trains standards
- *NSW Sustainable Design Guidelines – Version 3.0* (TfNSW, 2013a)
- *Guidelines for the Development of Public Transport Interchange Facilities* (Ministry of Transport, 2008).
- Crime Prevention Through Environmental Design (CPTED) principles
- other TfNSW policies and guidelines.

3.1.4 Sustainability in design

The development of the concept design for the Proposal has been undertaken in accordance with the project targets identified in TfNSW's Environmental Management System (EMS) and the *NSW Sustainable Design Guidelines - Version 3.0* (TfNSW, 2013a) which groups sustainability into seven themes:

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

Within each theme, potential initiatives are prioritised into two categories of requirements:

- **Compulsory** – the initiative is required to be implemented when applicable to the project as they refer to a corporate target, or are fundamental to the delivery of sustainable assets).
- **Discretionary** – the initiative has benefits to be implemented, however may not be the most appropriate.

A shortlist of compulsory initiatives has been developed by TfNSW specifically for Transport Access Program projects, which includes the Merrylands Commuter Car Parks. These compulsory initiatives have been reviewed and incorporated into the concept design (unless otherwise justified) and documented in a Sustainable Design Guidelines checklist that was approved by TfNSW (a summary of the key initiatives is provided in Appendix C). The

checklist and the initiatives contained within would be reviewed again at the detailed design and construction phases, and submitted for approval by TfNSW.

3.2 Construction activities

3.2.1 Work methodology

Subject to approval, construction is expected to commence in early 2017 and take around 12 months to complete. The construction methodology would be further developed during the detailed design of the Proposal by the nominated Contractor in consultation with 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 methodology is finalised. The staging is also dependent on the Contractor's preferred methodology, program and sequencing of work.

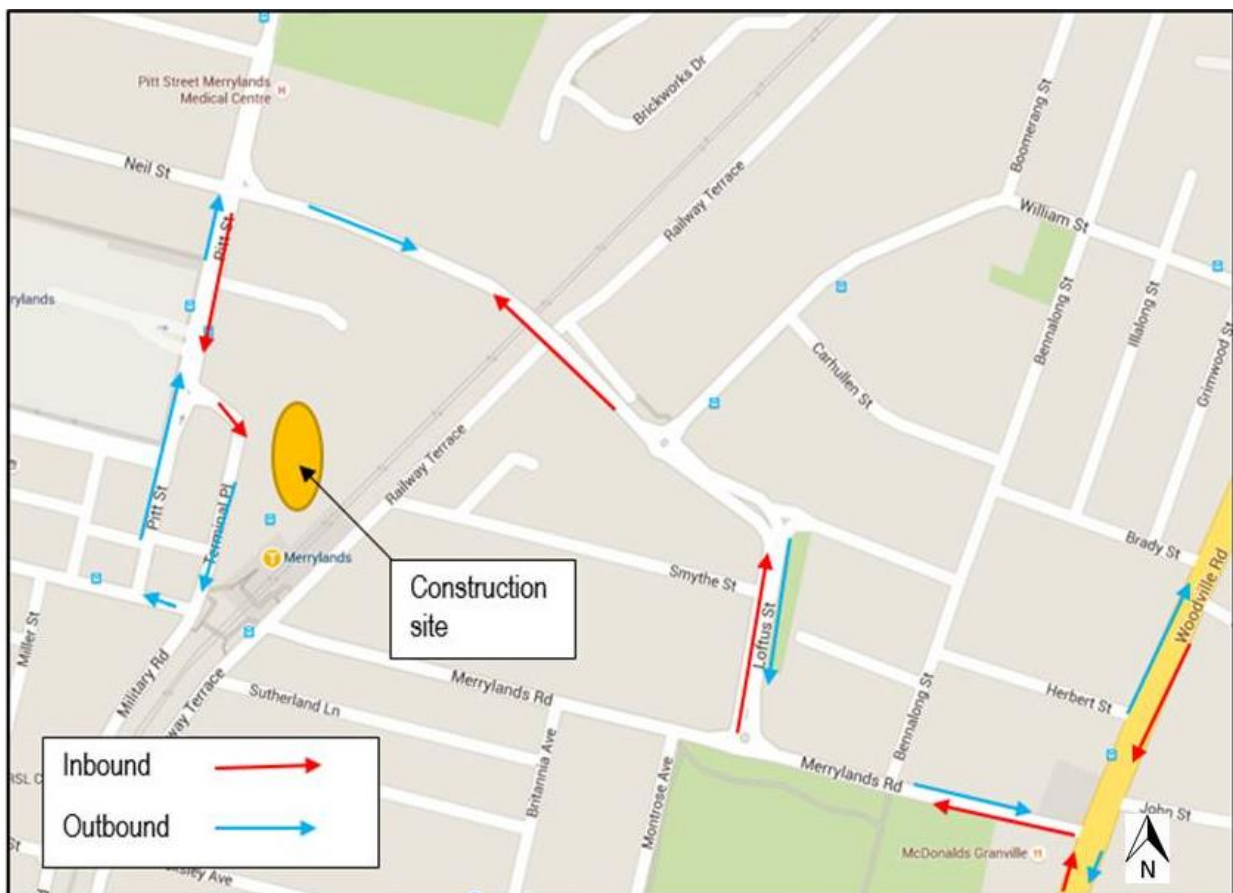


Figure 12 Construction access routes for Site 1

Note: Construction work associated with the new angle parking at Site 2 will have minimal impacts on the local road network due to the short period for construction and the small number of parking spaces affected.

Table 2 Indicative construction staging for key activities

Stage	Activities
Site establishment and preparation	<p>The Contractor would investigate and report on available alternative car parking prior to securing the site</p> <p>Secure site boundary with temporary fencing</p> <p>Provide traffic and pedestrian controls in the vicinity of the site in accordance with Cumberland Council (former Holroyd City Council) requirements</p> <p>Undertake survey to identify site boundary and mark out existing services and proposed foundations of car park</p> <p>Set tree protection zones</p> <p>Establish site office, amenities, hoardings and plant/material storage areas</p> <p>Establish other environmental controls, such as erosion and sediment controls</p>
Removal of vegetation	<p>Clear site of any vegetation that has been assessed and approved for removal</p>
Demolition of existing structure and site clearing	<p>Demolish obsolete kerbs and pavements and retaining walls</p>
Relocation of services and preparation of substructure	<p>Excavate and locate sewer and stormwater and prepare site for construction of foundations</p> <p>Proceed with preferred sewer service option</p> <p>Provide necessary services to various points within the car park footprint</p>
Construction of wall, floor slabs, columns and walls (Site 1 only)	<p>Construct new retaining wall</p> <p>Construct piles and ensure adequate embedment into appropriate bedrock is achieved</p> <p>Construct footing beams and pile caps over new piles</p> <p>Construct suspended levels, walls and columns one level at a time</p> <p>Construct ramps to each new level</p> <p>Construct block work on each level as detailed on the design drawings</p> <p>Make good of at grade car park where existing surface has been disturbed for installation of services or construction of new foundations</p>
Installation of lifts, fixtures, fittings, lighting, CCTV cameras etc.	<p>Install electrical, hydraulic and mechanical services infrastructure</p>
Construction of external cladding (Site 1 only)	<p>Install protective screens around building perimeter</p> <p>Install vehicular crash barriers</p> <p>Install balustrades as detailed on design drawings</p> <p>Landscape area at ground level</p> <p>Paint car park concrete elements</p> <p>Mark car park lines and directional arrows and install wayfinding signage</p>
Installation of wayfinding signage, landscaping etc.	<p>Construct various footpaths, kerbs, and shared footpaths to service the new car parks or reinstate where demolished</p>

3.2.2 Plant and equipment

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

- Trucks
- Generator
- Bobcat
- Hand tools
- Mulcher
- Chainsaw
- Excavator (with auger)
- Demolition saw
- Jack hammer
- Grinder
- Piling rig or concrete pump & concreter truck
- 200 tonne crane
- Scissor lift
- Fork lifts
- Franna crane
- Balloon wheel dumpies (trucks)
- Hi rail
- Lighting towers
- Rattle gun
- Wacker packer
- Vibratory roller
- Nail gun
- Helicopter (for smoothing concrete)
- Paving machine
- Coring machine

3.2.3 Working hours

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

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

To ensure continued operation of Merrylands interchange, certain works may need to occur outside standard hours and would include night works and works during scheduled Sydney Trains maintenance ‘track possessions’ which are scheduled closures that would occur regardless of the Proposal when part of the rail network is temporarily closed and trains are not operating.

Out of hours works are required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers; and to ensure the safety of railway workers and operational assets.

Out of hours works may also be scheduled outside scheduled maintenance periods. Approval from TfNSW would be required for any out of hours work and the affected community would be notified as outlined in TfNSW’s *Construction Noise Strategy (CNS)* (TfNSW, 2012c) (refer to Section 6.3 for further details).

3.2.4 Earthworks

Excavation and earthworks would generally be required for the following:

- Site 1*
- the new down ramp to the lower ground level from the ground (plaza) level
 - removal of the old retaining wall and installation of the new retaining wall
 - piling.
- Site 2*
- tie in to existing roads and pathways
 - other minor civil works, including drainage/stormwater works, and trenching activities for service adjustments and relocations.

Excavated material would be reused onsite where possible or disposed of in accordance with relevant legislative requirements. Waste management is discussed further in Section 6.11.

3.2.5 Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal, and would consider the requirements of the *NSW Sustainable Design Guidelines – Version 3.0* (TfNSW, 2013a). Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

3.2.6 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 displacement of parking at the existing car park on Terminal Place
- temporary displacement of parking on Railway Terrace
- temporary changes to the existing bus layover area / mail zone and the kiss-and-ride zone
- construction vehicle movements and access arrangements which may interrupt traffic flow on Terminal Place and Railway Terrace
- minor disruptions to pedestrian/cyclist movements in and around the station and car parks.

3.2.7 Ancillary facilities

A temporary construction compound would be required to accommodate a site office, amenities, laydown and storage area for materials. The following two locations have been considered for the location of the construction compound:

- Site 1 – near the northeast boundary of the site measuring about 64 metres by 8 metres and within Council and RailCorp owned land. A work zone would be located within the bus stop lane along Terminal Place (see Figure 13).

- Site 2 – near the southwest boundary of the site measuring about 25 metres by 5 metres within council owned land. A work zone would be located within the existing parallel parking zone along Railway Terrace (see Figure 14).

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



Figure 13 Site 1 Construction Site Footprint, showing indicative location of the site compound and works zone (TfNSW, 2016)

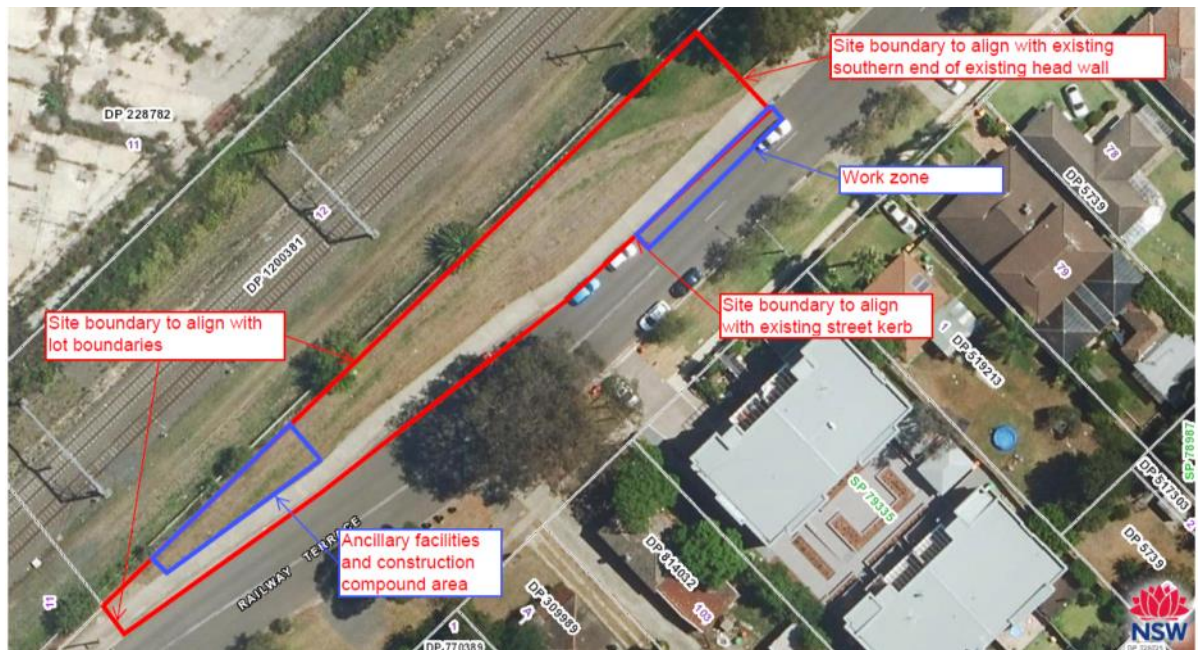


Figure 14 Site 2 Construction Site Footprint, showing indicative location of the site compound and works zone (TfNSW, 2016)

3.2.8 Public utility adjustments

A range of utilities are located within or adjacent to the site. A utility investigation, including a Dial Before You Dig search, was undertaken during the preliminary design stage. The following utilities have been identified within the vicinity of the Proposal.

Site 1

- Endeavour Energy – electrical
- Jemena – gas
- Sydney Water Corporation (SWC) – water and sewerage
- Cumberland Council (former Holroyd City Council) – stormwater drainage
- Telstra – telecommunications
- Sydney Trains – communications.

Sydney Water Corporation sewers exist in the area. A sewer is located near the existing entrance ramps from Terminal Place. The end of the sewer would need to be reduced in length and capped at the boundary by an accredited Sydney Water contractor. There are no other sewerage services likely to be affected by the works.

There are telecommunications cables outside the north eastern boundary of the site in Lot 1 DP 229589. These cables enter the proposed car park site near the boundary of Lot 1 DP 1173048. The position of the end of these cables needs to be confirmed as they may need to be removed for the proposed car park. NBN Co services exist in the area. The ducts noted above for Telstra are used by NBN Co and the properties are serviced by an NBN Co service.

Site 2

- Endeavour Energy – electrical
- Jemena – gas
- Sydney Water Corporation (SWC) – water and sewerage
- Cumberland Council – stormwater drainage
- Telstra and Optus – telecommunications
- Sydney Trains – communications.

Cumberland Council stormwater drainage assets exist in the area. The levels of the stormwater pit near the overpass for the rail line would require adjustment.

Endeavour Energy electrical services exist in the area.

RailCorp services exist in the area. The Proposal would be designed so as not to require relocation of electrical services.

Jemena gas mains exist in the area. The steel gas main should not be affected by the proposed works, although grading of the proposed car park should be considered in order to prevent any requirement to relocate the gas main.

There is a set of major telecommunication cable ducts in the north western footpath of Railway Terrace adjacent the RailCorp boundary fence. The ducts carry Telstra, Optus and Pipe Networks Fibre Optic cables. Subject to the grading of the car parks and the depth of final cover over the utilities this may affect the ability to construct the car parks and road pavements proposed. There is little if any opportunity to adjust these fibre optic cables should the need arise.

The Proposal has been designed to avoid relocation of services where feasible, however further investigation and relocation may be required. In the event that works would be required outside of this footprint, further assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase.

3.3 Property acquisition

Site 1

The majority of the land required for the Merrylands Commuter Car Park Site 1 Proposal is in the ownership of RailCorp, and is operated and maintained by Sydney Trains.

However, access to the existing car park and bus interchange area to the west of the existing car park is currently obtained via land owned by Cumberland Council. This Council land is part of Lot 1 DP 209516 and includes Terminal Place, which is not dedicated as a public road.

The existing Cumberland Council short-term car parking, located beneath the bus interchange area, obtains its egress through land which is in the ownership of RailCorp.

These existing informal arrangements for the bus interchange and adjoining car parking areas are not expected to be altered by the proposed commuter car park upgrade proposal. It is recognised that a future comprehensive redevelopment of the Council land west of Merrylands Station is contemplated by Cumberland Council, and these arrangements may then be altered. At this stage, there is no specific time frame for such a development.

Site 2

TfNSW does not propose to acquire any property as part of the Site 2 Proposal.

3.4 Operation management and maintenance

The future operation and maintenance of the Merrylands Commuter Car Parks is subject to further discussions with Sydney Trains, TfNSW and Cumberland Council. Structures constructed under this Proposal would be maintained by Sydney Trains. However it is expected that adjacent landscape areas would continue to be maintained by Cumberland Council.

4 Statutory considerations

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

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

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

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

4.2 NSW legislation and regulations

4.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning & Assessment Act 1979* (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 Part 5 of the EP&A Act. Part 5 of the EP&A Act 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 111 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 *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Part 5 of the EP&A Act has a significant impact on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with clause 228 and Appendix B specifically responds to the factors for consideration under clause 228.

4.2.2 Other NSW legislation and regulations

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

Table 3 Other legislation applicable to the Proposal

Applicable legislation	Considerations
<i>Contaminated Land Management Act 1997</i> (CLM Act) (NSW)	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. The site has not been declared under the CLM Act as being significantly contaminated (refer Section 6.8).
<i>Crown Lands Act 1987</i> (NSW)	The Proposal does not involve works on any Crown land.
<i>Disability Discrimination Act 1992</i> (DDA Act) (Cwlth)	The Proposal would be designed having regard to the requirements of this Act.
<i>Heritage Act 1977</i> (Heritage Act) (NSW)	<ul style="list-style-type: none"> • Sections 57 and 60 (approval) where items listed on the State Heritage Register are to be impacted • Sections 139 and 140 (permit) where relics are likely to be exposed • Section 170 where items listed on a government agency Heritage and Conservation Register are to be impacted. <p>The proposed commuter car park at Site 1 is located directly adjacent to Merrylands Station, which is listed on RailCorp's section 170 Heritage and Conservation Register and on the <i>Holroyd Local Environmental Plan 2013</i>.</p> <p>The archaeological assessment concluded that there is a low risk of exposing historical archaeological relics during construction and that no archaeological approvals under the Heritage Act would be required. A Statement of Heritage Impact and archaeological review have been undertaken for the Proposal and are summarised in Section 6.5.</p>
<i>National Parks and Wildlife Act 1974</i> (NPW Act) (NSW)	Sections 86, 87 and 90 of the NPW Act require consent from OEH for the destruction or damage of Indigenous objects. The Proposal is unlikely to disturb any Indigenous objects (refer Section 6.4). However, if unexpected archaeological items or items of Indigenous heritage significance are discovered during the construction of the Proposal, all works would cease and appropriate advice sought.
<i>Noxious Weeds Act 1993</i> (NSW)	There are six noxious weeds that have been identified in the Proposal area (Balloon Vine, Lantana, Broad-leaved Privet, Castor Oil, Morning Glory, and St. John's Wort). Appropriate management methods would be implemented during construction (refer Section 6.7).
<i>Protection of the Environment Operations Act 1997</i> (PoEO Act) (NSW)	The Proposal does not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, TfNSW would notify the EPA of any pollution incidents should they occur onsite. This would be managed in the CEMP to be prepared and implemented by the Contractor.

Applicable legislation	Considerations
<i>Roads Act 1993</i> (Roads Act) (NSW)	<p>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.</p> <p>The Proposal would involve works on Railway Terrace and Terminal Place, both of which are local roads under the control of Cumberland Council. Consent under the Roads Act is not required however Road Occupancy Licence/s would be obtained from Council for temporary road closures. Refer to Section 6.1 for more information.</p> <p>Any operational changes (such as changes to pedestrian crossings, parking/kiss and ride changes, bus zones, signage etc.) to Railway Terrace and Terminal Place would be undertaken with approval from the appropriate road authority.</p>
<i>Sydney Water Act 1994</i> (NSW)	The Proposal would not involve discharge of wastewater to the sewer.
<i>Threatened Species Conservation Act 1995</i> (TSC Act) (NSW)	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).
<i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act) (NSW)	TfNSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared.
<i>Water Management Act 2000</i> (NSW)	The Proposal would not involve any water use (from a natural source e.g. aquifer, river – only from the network), water management works, drainage or flood works, controlled activities or aquifer interference.

4.3 State Environmental Planning Policies

4.3.1 State Environmental Planning Policy (Infrastructure) 2007

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

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 Part 5 of the EP&A Act). Clause 78 defines ‘*rail infrastructure facilities*’ as ‘*associated public transport facilities for railway stations*’ which, under Clause 5, includes ‘*car parks intended to be used by commuters*’.

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 Part 5 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 that the Infrastructure SEPP prevails over all other environmental planning instruments except where *State Environmental Planning Policy (Major Development) 2005*, *State Environmental Planning Policy No 14 – Coastal Wetlands* or *State Environmental*

Planning Policy No 26 – Littoral Rainforest applies. The Proposal does not require consideration under these SEPPs and therefore it does not require further consideration as part of this REF.

4.3.2 State Environmental Planning Policy 55 – Remediation of Land

SEPP 55 provides a State-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment. While consent for the Proposal is not required, the provisions of SEPP 55 have still been considered in the preparation of this REF.

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

4.4 Local environmental planning instrument and development controls

Prior to May 2016 the Proposal was located within Holroyd LGA (Site 1) and Parramatta LGA (Site 2). On 12 May 2016 the New South Wales Minister for Local Government announced an amalgamation of parts of Parramatta City, Auburn City and Holroyd City LGAs into the newly formed Cumberland Council. Both site 1 and site 2 are located within the new Cumberland LGA. The provisions of the Infrastructure SEPP mean that Local Environmental Plans (LEPs), prepared by councils for an LGA, do not apply. However, during the preparation of this REF, the provisions of the following LEPs were considered:

- *Holroyd Local Environmental Plan 2013*
- *Parramatta Local Environmental Plan 2011.*

4.4.1 Holroyd Local Environmental Plan 2013

The *Holroyd Local Environmental Plan 2013* (Holroyd LEP) is the governing plan for the former Holroyd LGA, including the part of Merrylands west of the rail line and Site 1 of the Proposal. Table 4 summarises the relevant aspects of the Holroyd LEP applicable to the Proposal. Figure 15 shows the relevant section of the zoning map from the Holroyd LEP, with the indicative location of the Proposal.

Table 4 Relevant provisions of the Holroyd LEP

Provision description	Relevance to the Proposal
Land Use Zone B4 Mixed Use and SP2 Rail Infrastructure Facility	<p>Site 1 is currently used as a timed/untimed car park and located in land zoned B4 Mixed Use and SP2 Rail Infrastructure Facility.</p> <p>The land use objectives within the B4 zone include:</p> <ul style="list-style-type: none"> • to provide a mixture of compatible land uses • to integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling • to facilitate a vibrant, mixed-use centre with active retail, commercial and other non-residential uses at street level • to encourage the development and expansion of business activities that will strengthen the economic and employment role of the Merrylands town centre. <p>The land use objectives within the SP2 zone include:</p> <ul style="list-style-type: none"> • to provide for infrastructure and related uses • to prevent development that is not compatible with or that may detract from the provision of infrastructure. <p>Site 1 of the Proposal is consistent with the objectives of the B4 zone and SP2 zone as it would be utilised for public purposes. A commuter car park adjacent to Merrylands Station maximises public transport and supports infrastructure related uses, and therefore is a use consistent with a town centre and rail infrastructure facility.</p>
Clause 6.8 Salinity Potential Areas	<p>The Proposal is located within an area mapped as having Moderate Salinity Potential.</p> <p>The objective of clause 6.8 in the LEP is to provide for the appropriate management of land that is subject to salinity and ensure the minimisation and mitigation of adverse impacts from development that contributes to salinity.</p> <p>The works involve relatively minor levels of excavation and are not anticipated to alter groundwater drainage patterns. The works are not expected to worsen salinisation in the local area.</p>
Clause 5.10 Heritage Conservation	<p>The objectives of the Heritage Conservation clause (clause 5.10) is to:</p> <ul style="list-style-type: none"> • to conserve the environmental heritage of Holroyd Council • to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views, • to conserve archaeological sites, • to conserve Aboriginal objects and Aboriginal places of heritage significance. <p>Site 1 is directly adjacent to the heritage building at Merrylands Railway Station. Heritage items identified within the vicinity of Site 1 are described in Section 6.5. this section also identifies measures to minimise impacts on these heritage items.</p>

Provision description	Relevance to the Proposal
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Clause 6.4
 Flooding Planning

The objectives of this clause are:

- to minimise the flood risk to life and property associated with the use of land
- to allow development on land that is compatible with the land's flood hazard, taking into account projected changes as a result of climate change
- to avoid significant adverse impacts on flood behaviour and the environment.

The Proposal is located within areas determined by Holroyd Council to be within the 1% AEP extent. Further hydrological assessment would be undertaken to ensure that the Proposal would not be impacted by flooding and would not worsen local flooding patterns.

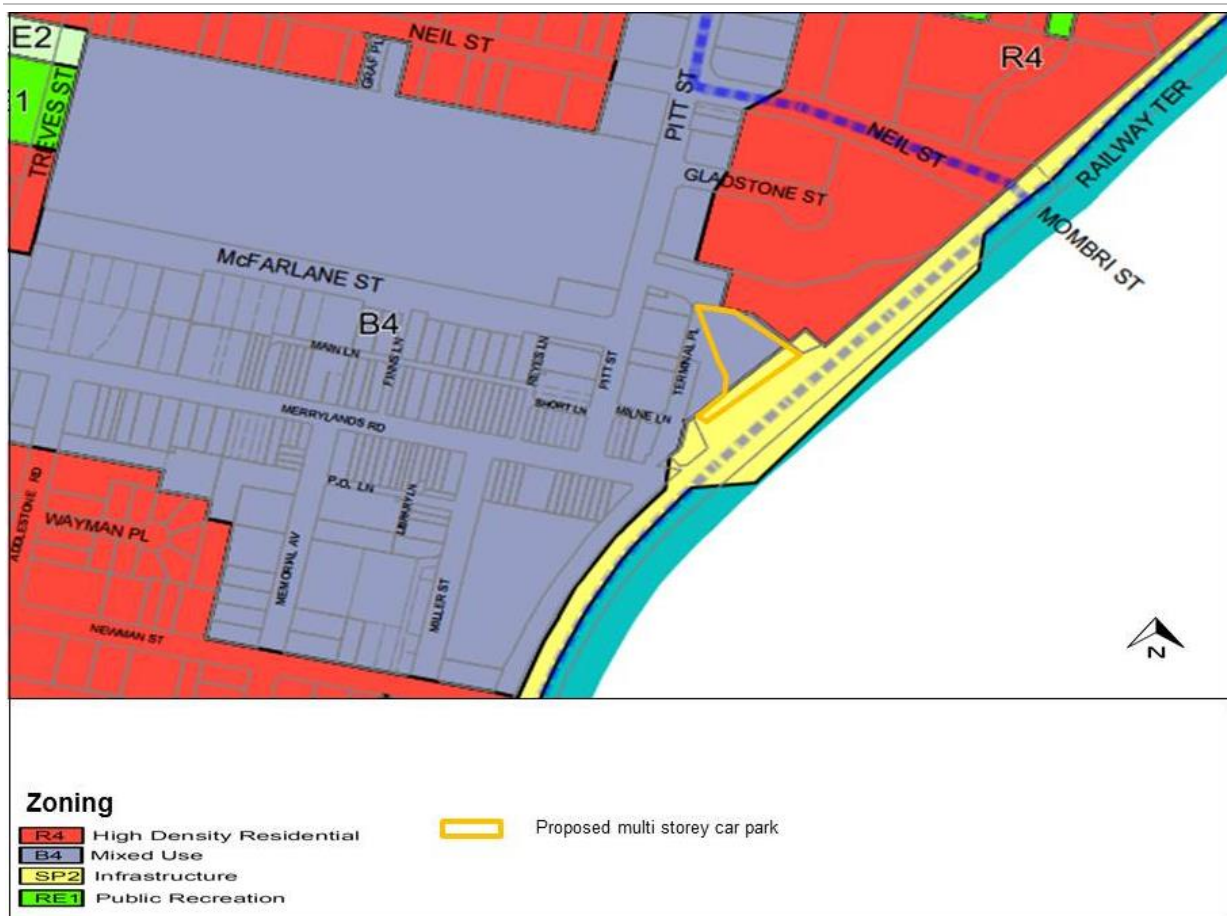


Figure 15 Holroyd LEP 2013 zoning map

4.4.2 Parramatta Local Environmental Plan 2011

The *Parramatta Local Environmental Plan 2011* (Parramatta LEP) is the governing plan for the Parramatta LGA, including the part of Merrylands east of the rail line and Site 2 of the Proposal. Table 5 summarises the relevant aspects of the Parramatta LEP applicable to the Proposal. Figure 16 shows the relevant section of the zoning map from the Parramatta LEP, with the indicative location of the Proposal.

Table 5 Relevant provisions of Parramatta Local Environmental Plan 2011

Provision description	Relevance to the Proposal
<p>Land Use Zone R4 High Density Residential</p>	<p>Site 2 is currently within the Railway Terrace road reserve and located in land zoned as R4 High Density Residential. The land use objectives within the R4 zone include:</p> <ul style="list-style-type: none"> • to provide for the housing needs of the community within a high density residential environment • to provide a variety of housing types within a high density residential environment • to enable other land use that provides facilities or services to meet the day to day needs of residents • to provide opportunity for high density residential development close to major transport nodes, services and employment opportunities • to provide opportunities for people to carry out a reasonable range of activities from their homes if such activities will not adversely affect the amenity of the neighbourhood. <p>Site 2 is directly adjacent (within 1 metre) to Zone SP2 Infrastructure to which the objectives of zone apply to the Proposal. Clause 5.3 of the LEP provides flexibility where the investigation of a site and its surroundings reveals that a use allowed on the other side of a zone boundary would enable a more logical and appropriate development of the site and be compatible with the planning objectives and land uses for the adjoining zone.</p> <p>Site 2 is consistent with the objectives of the LEP as there would be ancillary services (at-grade commuter car park) supporting the nearby railway station and so is consistent with land zoning in this area.</p>
<p>Clause 6.1 Acid Sulfate Soils</p>	<p>The Site is located within an area mapped as potentially having Class 5 Acid Sulfate Soils.</p> <p>The objective of this clause is to ensure that development does not disturb, expose or drain acid sulfate soils and cause environmental damage.</p> <p>It is unlikely that the Proposal would disturb acid sulfate soils as the Proposal area is underlain by Wianamatta Group shales and residual soils, which do not comprise Potential Acid Sulphate Soils (PASS).</p>
<p>Clause 5.10 Heritage</p>	<p>The objectives of the Heritage Conservation clause is to:</p> <ul style="list-style-type: none"> • to conserve the environmental heritage of Parramatta • to conserve the heritage significance of heritage items and heritage conservation areas, including associated fabric, settings and views • to conserve archaeological sites • to conserve Aboriginal objects and Aboriginal places of heritage significance. <p>Site 2 is located 300m north of the station, which was formerly within the Parramatta LGA. Site 2 does not affect views, to or from, the Merrylands Railway Station Building.</p> <p>Site 2 would utilise part of the road reserve and an existing path area. The archaeological potential is nil-low at this site, therefore it is not anticipated that the proposed works would have an archaeological impact.</p>

Provision description

Relevance to the Proposal

Clause 6.3
Flood Planning

The objectives of this clause are:

- to minimise the flood risk to life and property associated with the use of land
- to allow development on land that is compatible with the land's flood hazard, taking into account projected changes as a result of climate change
- to avoid significant adverse impacts on flood behaviour and the environment.

The Proposal is located within areas determined by the former Holroyd Council to be within the 1% AEP extent. Further hydrological assessment would be undertaken to ensure that the Proposal would not be impacted by flooding and would not worsen local flooding patterns.

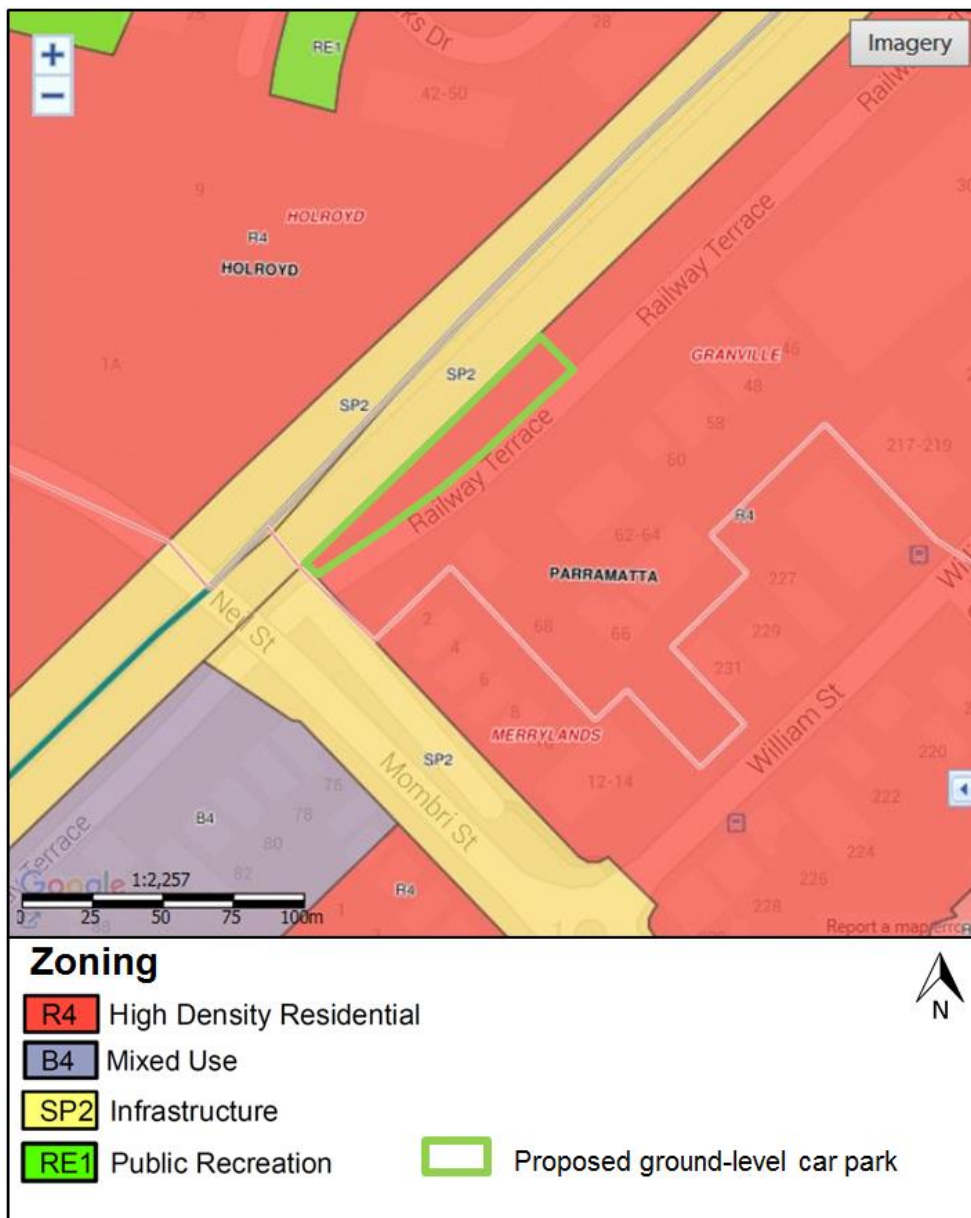


Figure 16 Parramatta LEP 2011 zoning map

Table 6 provides an overview of other NSW Government policies and strategies relevant to the Proposal.

Table 6 NSW Government policies and strategies applicable to the Proposal

Policy/Strategy	Commitment	Comment
<p>State Priorities – NSW: Making It Happen (NSW Government, 2015)</p>	<p><i>In September 2015, the NSW Government announced a series of State Priorities as part of NSW: Making It Happen (NSW Government, 2015). The State Priorities are intended to guide the ongoing actions of the NSW Government across the State, and guide resource allocation and investment in conjunction with the NSW Budget. NSW: Making it Happen focuses on 12 key ‘priorities’ to achievement the NSW Government’s commitments. These priorities range across a number of issues including infrastructure, the environment, education, health, wellbeing and safety in addition to Government services.</i></p> <p>One of the 12 priorities identified as part of NSW: Making It Happen relates to investment in building infrastructure. The ongoing development and investment in transport infrastructure is identified as part of the wider building infrastructure priority.</p>	<p>The Proposal assists in meeting the priority by providing approximately 85 additional car parking spaces to rail customers at Merrylands Station. The Proposal would also make public transport more accessible and encourage the use of public transport.</p>
<p>NSW Long Term Transport Master Plan (TfNSW, 2012a)</p>	<p>The <i>NSW Long Term Transport Master Plan</i> identifies a planned and co-ordinated set of actions to address transport challenges and will guide the NSW Government’s transport funding priorities over the next 20 years.</p> <p>The Master Plan would meet a number of challenges to building an integrated transport system for Sydney and NSW, including:</p> <ul style="list-style-type: none"> • customer-focused integrated transport planning • integrated modes to meet customer needs • getting Sydney Moving Again • sustaining Growth in Greater Sydney. <p>The Master Plan also links to other regional and sub-regional strategies, and national plans.</p>	<p>The Proposal implements the following key themes in the Master Plan:</p> <ul style="list-style-type: none"> • improving customers’ journey experience • making better use of existing assets • providing accessible transport to help address social exclusion.

Policy/Strategy	Commitment	Comment
<p>Disability Action Plan 2012-2017 (TfNSW, 2012b)</p>	<p>The <i>Disability Action Plan 2012-2017</i> was developed by TfNSW in consultation with the Accessible Transport Advisory Committee, which is made up of representatives from peak disability and ageing organisations within NSW.</p> <p>The Disability Plan discusses the challenges, the achievements to date, the considerable undertaking that is required to finish the job, and provides a solid and practical foundation for future progress over the next five years.</p>	<p>The Proposal has been developed with consideration of the objectives outlined in this Plan and seeks to improve and provide equitable access to public transport facilities.</p>
<p>Sydney's Walking Future - Connecting people and places (TfNSW, 2013b)</p>	<p><i>Sydney's Walking Future</i> outlines the NSW government's efforts to:</p> <ul style="list-style-type: none"> • promote walking for transport • connect people to places through safe walking networks around activity centres and public transport interchanges. 	<p>The Proposal would facilitate walking by removing physical barriers to accessible public transport, hence contributing a relative reduction in local trips via private cars.</p>
<p>Rebuilding NSW – State Infrastructure Strategy 2014 (NSW Government, 2014)</p>	<p><i>Rebuilding NSW</i> is a plan to deliver \$20 billion in new productive infrastructure to sustain productivity growth in our major centres and regional communities.</p> <p>Rebuilding NSW will support overall population growth in Sydney and NSW. Public transport is viewed as critical to urban productivity, expanding employment opportunities by connecting people to jobs, reducing congestion, and supporting delivery of urban renewal.</p>	<p>The Proposal supports investment in rail infrastructure, and aligns with the reservation of \$8.9 billion for urban public transport to support Sydney's population, that is expected to reach almost six million by 2031.</p>
<p>A Plan for Growing Sydney (Department of Planning and Environment, 2014)</p>	<p><i>A Plan For Growing Sydney</i> superseded the draft <i>Metropolitan Strategy for Sydney 2036</i>. The Plan provides information on the strategies to accommodate an additional 664,000 homes and 689,000 jobs by 2031, which in part will be helped by a more integrated transport network.</p> <p>The Proposal is located in the West Central subregion and the priorities relevant for the West Central area include:</p> <ul style="list-style-type: none"> • A competitive economy • Accelerate housing supply, choice and affordability and build great places to live • Protect the natural environment and promote its sustainability and resilience 	<p>The Proposal would be consistent with the aims of the following directions by providing more accessibility to the Merrylands Station and to the suburb centre:</p> <ul style="list-style-type: none"> • Direction 1.4: Transform the productivity of Western Sydney through growth and investment • Direction 1.11: Deliver infrastructure • Direction 3.1: Revitalise existing suburbs

4.5 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 Merrylands Commuter Car Parks. Section 3.1.4 summarises how ESD would be incorporated in the design development of the Proposal. Section 6.13 includes an assessment of the Proposal on climate change and sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5 Community and stakeholder consultation

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

5.1 Stakeholder consultation during concept design

As part of the development of concept design options, TfNSW consulted with Sydney Trains, the former Holroyd City Council and the former Parramatta City Council. Sydney Trains were involved in the TfNSW workshops to identify key issues and decide on a preferred option.

(Former) Holroyd City Council

A meeting was held with the former Holroyd City Council on 13 November 2014 and the following key issues were raised by the Council for consideration during the development of the preferred option:

Developments and zoning

- Merrylands is soon to experience significant change due to increases to densities
- there is significant developer interest in Neil Street
- The site between Pitt Street, Neil Street, and Gladstone Street is slated for an approximately 20 storey development
- residential developments at the corner of Neil and Pitt Streets are prone to flooding
- zoning height at the RSL location has increased from eight to fifteen storeys.

Community

- Council is looking to create a town square space near Red Rooster on Merrylands Road, to provide community use land
- if a town square is created (where there is currently a large number of council parking spaces) the parking spaces would need to be offset somewhere within the town centre.

Parking

- Merrylands RSL has a lease agreement for all spaces on Military Road along the rail corridor
- the Stockland car park has provided more than necessary spaces for shoppers including some untimed parking spaces within this car park
- there are some traffic problems on Pitt Street due to the high usage of the Stockland car park.

Traffic

- traffic issues at the corner of Pitt and Neil should be considered
- Council is looking to widen streets to create a bypass (long term plan).

Parramatta City Council

A meeting was held with the Parramatta City Council on 11 November 2014 and the following key issues were raised by the council for consideration during the development of the preferred option:

- the station parking option relates more to the (former) Holroyd City Council's LGA (now Cumberland LGA)
- timed parking has been implemented at the Stockland shopping centre, and that has resulted in a loss of untimed parking near the station
- shops on the (former) Parramatta City Council side of the station value close customer parking and would likely want to maintain the number of timed spaces
- there could be a small extension of the Military Road parallel parking area as long as it does not impact on the cycleway or landscaping.

The preferred option incorporates many of these considerations. Other improvements to pedestrian access would be investigated at detailed design.

Another meeting was held at Parramatta City Council on 23 September 2015. Holroyd City Council stated that development applications had already been submitted for new developments around the car park. In addition, the draft Master Plan, exhibited publicly in January 2016, could potentially lead to increased development in the area.

Parramatta City Council informed the meeting that its draft Master Plan would be on public exhibition in mid-2016. This would outline potential future development in the area. Council identified that the cycleway at the location would need to be maintained with a 3m width.

A third meeting was held with Parramatta City Council on 12 February 2016 to provide a project update. Council advised that they were proposing construction of a new road to the north of the Site 1 Proposal, with a lease agreement permitting an overriding development option of up to sixteen storeys.

It should be noted that at the time of consultation the Proposal was partly within the Parramatta City Council LGA. Following Council amalgamations, the Proposal is now wholly within Cumberland Council LGA.

5.2 Consultation requirements under the Infrastructure SEPP

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

Table 7 provides details of consultation requirements under the Infrastructure SEPP for the Proposal.

Table 7 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
<p>Clause 13 Consultation with Councils – development with impacts on council related infrastructure and services</p>	<p>Consultation is required where the Proposal would result in:</p> <ul style="list-style-type: none"> • substantial impact on stormwater management services • generation of traffic that would place a local road system under strain • connection to or impact on a council owned sewerage system • connection to and substantial use of council owned water supply • significant disruption of pedestrian or vehicle movement • significant excavation to a road surface or footpath for which Council has responsibility. 	<p>The Proposal includes works that would:</p> <ul style="list-style-type: none"> • require connections or impacts the stormwater system • disrupt pedestrian and vehicle movements • impact on road pavements under Council's care and control • impact on Council-operated footpaths. <p>Consultation with the former Holroyd City Council and the former Parramatta City Council has been undertaken and consultation would continue with Cumberland Council throughout the detailed design and construction phases. Cumberland Council would also be formally notified under ISEPP requirements.</p>
<p>Clause 14 Consultation with Councils – development with impacts on local heritage</p>	<p>Where railway station works:</p> <ul style="list-style-type: none"> • substantially impact on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area. 	<p>While Site 1 is adjacent to a listed heritage item (Merrylands Railway Station), there is no proposed impact to local heritage/heritage conservation areas. Accordingly, consultation with Council is not required. Refer to Section 6.5.</p>
<p>Clause 15 Consultation with Councils – development with impacts on flood liable land</p>	<p>Where railway station works:</p> <ul style="list-style-type: none"> • impact on land that is susceptible to flooding – reference would be made to <i>Floodplain Development Manual: the management of flood liable land</i>. 	<p>The Proposal is located on land that is susceptible to flooding. Accordingly, consultation with Cumberland Council is required in regard to this aspect. Refer to Section 6.9.</p>
<p>Clause 16 Consultation with public authorities other than Councils</p>	<p>For <i>specified development</i> which includes consultation with the OEH for development that is undertaken adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i>, and other agencies specified by the Infrastructure SEPP where relevant.</p> <p>Although not a specific Infrastructure SEPP requirement, other agencies TfNSW may consult with could include:</p> <ul style="list-style-type: none"> • Roads and Maritime • Sydney Trains • Sydney Water • OEH. 	<p>The Proposal is not located adjacent to land reserved under the <i>National Parks and Wildlife Act 1974</i>. Accordingly, consultation with the OEH on this matter is not required.</p>

5.3 Consultation strategy

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

The objectives of the consultation strategy are to:

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

5.4 Public display

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

- public display of the REF at various locations
- distribution of a project update at the station, and to local community and rail customers, outlining the Proposal and inviting feedback on the REF
- advertisement of the REF public display in local newspapers with a link to the TfNSW website that includes a summary of the Proposal and information on how to provide feedback
- consultation with council, Sydney Trains, NSW Trains and other non-community stakeholders.

Community consultation activities for the Proposal would be undertaken during the public display of this REF. The display period of the REF would be advertised in the week that the public display commences. The REF would be displayed for a period of 2 weeks.

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

- Merrylands Central Library, corner of Miller and Newman Streets
- Cumberland Council Customer Service Centre, 16 Memorial Avenue, Merrylands
- Transport for NSW, Zenith Centre, L5, Tower A, 821 Pacific Highway, Chatswood.

The REF would also be available on the [TfNSW website](#)². Information on the Proposal would be available through the Project Infoline (1800 684 490) or by [email](#)³. During this time feedback is invited. Following 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 Proposal should it be determined to proceed.

5.5 Aboriginal community involvement

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken for the area covered by the Proposal (Site 1 and Site 2) plus a 200 metre radius, on 19 February 2016. The search did not identify any Aboriginal sites recorded in or near the subject location, and no Aboriginal places have been declared in or near the subject location. Therefore, it was not considered necessary to undertake specific Aboriginal consultation.

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

5.6 Ongoing consultation

At the conclusion of the public display period for this REF, TfNSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by TfNSW before determining whether to proceed with the Proposal (refer Figure 1, page 15).

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

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

² <http://www.transport.nsw.gov.au/projects-tap>

³ projects@transport.nsw.gov.au

6 Environmental impact assessment

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

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

6.1 Traffic and transport

A Traffic, Transport and Access Impact Assessment (TT&AIA) was undertaken by SECA Solutions in March 2016 (SECA, 2016) (See Appendix D). The results of the TT&AIA are summarised below.

6.1.1 Existing environment

Road network

Site 1

Site 1 is located on Terminal Place, to the immediate west of Merrylands Station with access via Pitt Street/Terminal Place to the north and Military Road to the south.

Merrylands Road is a major regional two-way road serving the locality. At the intersections of Military Road and Terminal Place, Merrylands Road is one-way only west bound, providing three lanes of traffic, two of which go into Pitt Street north bound. Within the town centre Merrylands Road has a speed limit of 40km/h. Merrylands Road connects with Woodville Road to the east; however, it is discontinued at the railway line with east-west traffic, instead crossing the railway line at the Neil Street overbridge.

Military Road is a local road that provides a single lane of travel in both directions and connects with Merrylands Road and Terminal Place; however, as both of these streets are one way, north bound traffic along Military Road is directed onto Merrylands Road west bound. Traffic from the car park exits from a ramp and is controlled by the existing traffic signals at the intersection of Terminal Place/Merrylands Road and Military Road.

Terminal Place is a one-way local road serving the Merrylands Transport Interchange. It provides two lanes of travel southbound and a third lane on the eastern side for bus and taxi set down.

Site 2

Site 2 is located approximately 300 metres north of Merrylands Station on Railway Terrace.

Railway Terrace is a two-way regional road which runs on the eastern side of the rail corridor, parallel to the railway line. It provides intermittent parallel parking with 90 degree parking within the vicinity of the station. It functions under the speed limit of 60km/h. Railway Terrace intersects with Merrylands Road near the eastern railway station entrance.

Traffic

Traffic surveys were conducted on 22 February 2016 to determine the current peak hour flows at the key intersections that may be impacted by the Proposal. Surveys were conducted at the intersection of Military Road and Merrylands Road and the intersection of Merrylands Road

and Railway Terrace during but not for the full duration of the typical morning (7.00am and 9.30am) and evening (4.00pm and 6.30pm) commuter periods. A summary of the peak hour traffic flows is shown in Table 8 for Site 1 and Table 9 for Site 2.

Site 1

Table 8 Surveyed peak hour traffic volumes at key intersections (Site 1)

Intersection	Morning 8–9am	Evening 4.15–5.15pm
Terminal Place	499	743
Military Road (two-way)	697	729
Merrylands Road (west of Military Road)	760	693

Traffic surveys indicate the road network west of the train station currently operates well, with some delays and congestion created by traffic signal controlled intersections during the peak periods. The adjacent roadways operate as a one-way clockwise circuit to manage traffic movements efficiently. Traffic flows show a dominant movement in the morning towards the town centre and railway station. In the afternoon the flows are away from the town centre and are influenced by one-way movements along Merrylands Road and Terminal Place.

A high level of pedestrian activity adjacent to the railway station, at the intersection of Merrylands Road and Terminal Place, creates some delays and congestion, but the overall operation is acceptable. The traffic signals at this location allow traffic to exit the train station interchange area. The traffic signals use separate signal phases for the bus interchange and the car park exit to manage the traffic movements.

Existing traffic flows at the site are influenced by the timed/untimed commuter car park and the bus and taxi interchange. The car park currently provides parking spaces for 155 vehicles and surveys show that the inbound traffic, equivalent to this, would be expected to occur between 6.30am and 7.30am. For outbound traffic movements, 50% are considered to be between 5pm and 6pm with the remaining between 6pm and 7pm. Surveys show that 94 vehicles exited the car park/interchange between 5pm and 6pm, including 19 buses. There are very limited heavy vehicle movements along the local roads; however, the interchange brings a high number of buses within the vicinity of the site.

Site 2

Table 9 Surveyed peak hour traffic volumes at key intersections (Site 2)

Intersection	Morning 7.45–8.45am	Evening 4–5pm
Railway Terrace (two-way north of Merrylands Road)	510	332
Railway Terrace (two-way south of Merrylands Road)	894	799
Merrylands Road (two-way east of Railway Terrace)	470	638

Traffic movements along Railway Terrace operate well with very limited delays. Traffic flows on the eastern side of the railway line show a dominant flow north along Railway Terrace as well as east from Railway Terrace along Merrylands Road. The afternoon flows are tidal with the dominant movement from Merrylands Road turning left onto Railway Terrace.

Existing traffic flows at the site are influenced by the provision of parallel parking for four vehicles and a bus zone. There are very limited heavy vehicle movements along the local roads, mainly associated with waste collection and bus services.

Public Transport

Rail

Merrylands Station is located approximately 24 kilometres from Central Station and is serviced by the T2 Inner West and South Line and the T5 Cumberland Line. The T2 train lines provide both express and all stops trains to the Sydney CBD.

Merrylands Station is currently ranked the 50th busiest railway station on the Sydney Trains network, recording approximately 10,500 customer trips during a typical weekday in 2014 (Bureau of Transport Statistics, 2014). Most demand occurs during typical peak periods for commuter trips between 6am and 9am, and between 3pm and 6.30pm. The station patronage is predicted to increase by 114% by 2036.

The station consists of two island platforms connected to the adjacent streets by a footbridge and is an accessible station.

Bus

Site 1

The transport interchange at Site 1 provides facilities for buses, kiss and ride and a taxi rank. Merrylands Station is serviced by bus routes which provide a connection to the surrounding areas including:

- Routes 802, 804 and 806 to Liverpool
- Route 809 to Pemulwuy
- Route 810 to Parramatta
- Route 820 and 822 to Guildford
- Route 908 to Bankstown
- Route 818 to Westmead.

A third lane on the eastern side of Terminal Place services buses and taxi drop offs. Traffic signals allow traffic to exit the train station interchange area, and employ separate phases for the bus interchange and the car park exit, so that traffic movements are managed.

Site 2

There is a bus zone sign (school days only 7.30-9am and 2.30-4pm) directly adjacent to Site 2. The Network Planning Managers have advised there is no issue with removal of this sign, as the bus route does not exist in the Transit Stop Management (TSM) stop network.

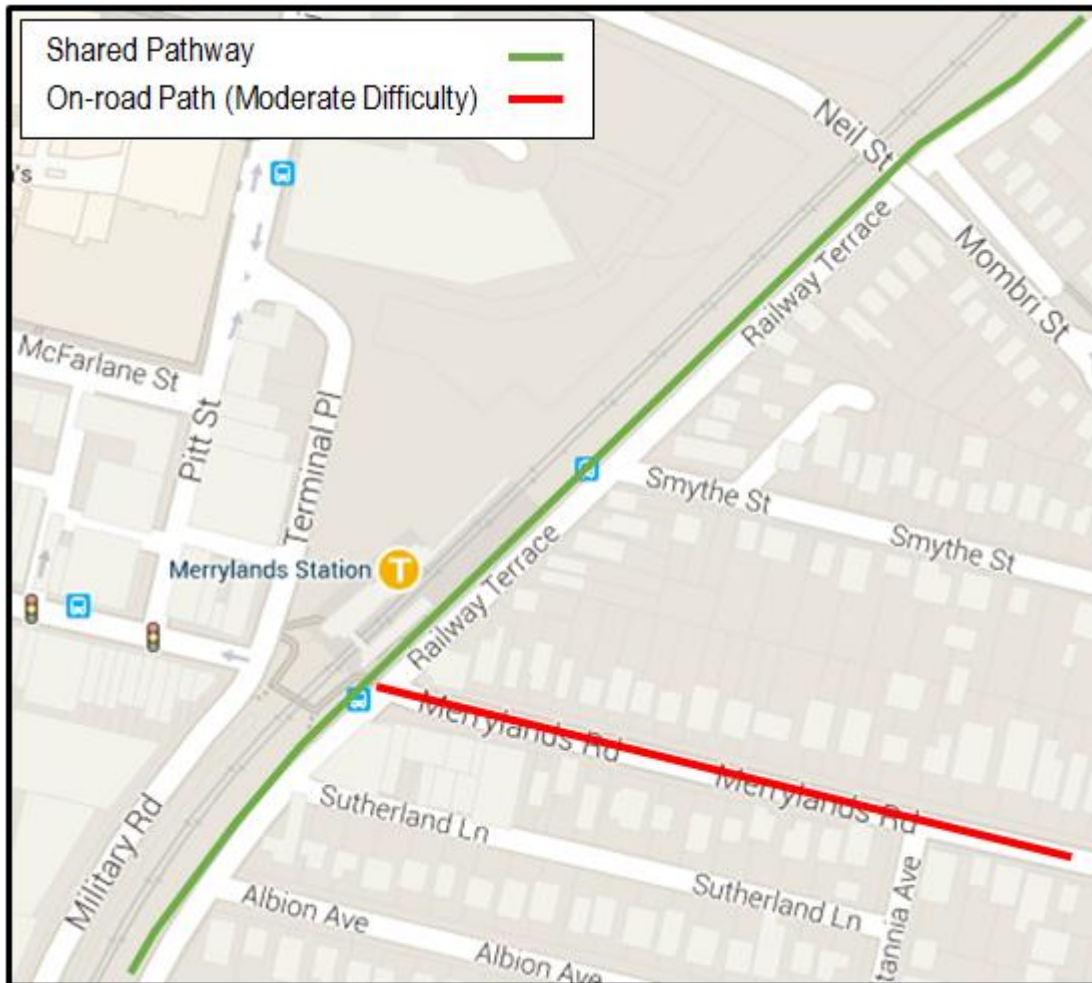


Figure 17 Existing cycling facilities at Site 2

Taxi and informal kiss and ride

There is a taxi zone located on Terminal Place to the front of the transport interchange that has the capacity to hold two vehicles.

There is a 'No Parking' zone provided along Terminal Place which allows drivers to stop for up to two minutes (remaining within three metres of the vehicle at all times). This provides for patrons of either bus or train services to alight from vehicles. This 'No Parking' zone can accommodate up to five vehicles at any one time.

Pedestrian access

Site 1

The streets within the vicinity of the railway station provide a good network of pedestrian pathways which connect the town centre and the railway station. There are signalised pedestrian movements allowed on all legs of the Merrylands Road/Terminal Place/Military Road intersection ensuring safe pedestrian connectivity to the railway station.

The existing car park is located immediately adjacent to the railway station. A pedestrian connection is available between the two via steps and an accessible ramp. There are lifts provided to access the concourse and platforms. A survey of pedestrian movements concluded the peak morning period occurs between 7.30am and 8.30am. Afternoon pedestrian movements are spread evenly across the period between 4.15pm and 6.30pm.

Site 2

The western side of Railway Terrace includes a pedestrian pathway along its length that connects to the station. There is a zebra crossing provided on Railway Terrace that leads directly into the station entrance. Morning pedestrian movements on Railway Terrace occur between 7.30am and 8.30am. In the evening there is a distinct peak of pedestrian movements between 5.30pm and 6.30pm.

Bicycles

Commuter cyclists are catered for by the provision of eight bicycle lockers on Terminal Place around 80 metres to the north of Merrylands Station. There are no bicycle storage facilities along Railway Terrace or at the eastern entrance to Merrylands Station.

Site 1

An on-road cycling route is available along McFarlane Street between the railway station and Treves Street west of the station. This route connects with an off-road route north to Holroyd Gardens and west to Merrylands Park.

Site 2

There is a shared pathway running parallel to the rail corridor along the western side of Railway Terrace connecting the proposed angle parking with the Merrylands Station. This pathway is three metres wide increasing to around 4.5 metres past the station.

Parking

Site 1

Currently parking in the precinct consists of approximately 664 untimed car parking opportunities comprising approximately 300 untimed parking spaces in the Stockland Merrylands shopping centre and 209 untimed on-street spaces.

There are 155 spaces (including approximately 40 x two hour timed spaces) at the existing commuter car park at the transport interchange.

Merrylands Road offers intermittent kerbside parking along its length. There is 90 degree parking available along the eastern side of Military Road restricted for patrons of Merrylands RSL Club only, and one hour time restricted parallel parking generally available along the western side near the station.

There is significant demand for unrestricted parking due to rail commuters. The existing commuter car parking spaces were found to be completely occupied by 7.00am and overflow demand was found to spill over onto unrestricted on street spaces within walking distance on the eastern side of the station. The public parking within the all-day parking area in the Stockland Merrylands shopping centre was full by 8.00am.

Site 2

On street commuter parking is available along Railway Terrace on the eastern side of the rail corridor. There is 90 degree commuter parking available to the north of Merrylands Station with the capacity for 46 vehicles and angle parking spaces to the south of the station with the capacity for nine vehicles.

Local roads to the east of the station are primarily residential and offer unrestricted on-street parking opportunities for residents and commuters. On-street parking along Merrylands Road in the general locality of the station is limited to one hour during the day.

There is significant demand for on street commuter parking spaces along Railway Terrace to the east of the station. Parking opportunities are heavily utilised with the local parking observed to reach full capacity by 7.30am on weekday mornings.

Motorcycle parking

There are no formal motorcycle parking spaces in the general locality of Merrylands Station or within the vicinity of the proposed angle parking on Railway Terrace.

6.1.2 Potential impacts

a) Construction phase

Road network

The indicative construction traffic routes that may be used for the Proposal are:

- Site 1 – from Woodville Road via Merrylands Road, Loftus Street, Neil Street Overbridge and Pitt Street to Terminal Place
- Site 2 – from Woodville Road via Merrylands Road to Railway Terrace.

Temporary road closures may be required for short periods during construction to facilitate works (such as kerb and gutter works).

Traffic

Construction of the Proposal would result in a minor temporary increase in traffic as a result of the movement of construction workers, delivery of construction materials, equipment and machinery and spoil removal.

The volume of heavy vehicles accessing Site 1 could be up to 50 per day during peak construction periods, and 15 per day outside of peak periods. The volume of light vehicles used by construction workers is anticipated to be 20 vehicles per day during peak construction periods and 15 outside of peak periods.

The volume of heavy vehicles accessing Site 2 could be up to 10 per day during peak construction periods, with fewer vehicles accessing the site outside of the peak periods. The volume of light vehicles used by construction workers is anticipated to be five vehicles per day during peak construction periods and three outside of peak periods.

The volume of construction traffic movements during the morning and afternoon peak periods would likely be minimal. The peak construction traffic movements are mainly generated by staff accessing the site using light vehicles, and these movements are typically generated prior to the peak traffic movements in the morning and in the afternoon.

Heavy vehicles cannot access Site 1 as the exit ramp off Terminal Place does not accommodate the swept path movements of heavy vehicles. There is also an existing height restriction of 2.2m at the entry to the lower level of parking due to the interchange terminal. Thus the site would require a works zone to be established at Terminal Place during key construction activities, such as concrete pours and material deliveries (refer to Figure 13).

Heavy vehicle construction movements, including materials and concrete deliveries, would be likely distributed throughout the day. Movements would be scheduled to avoid local traffic peaks as part of a Construction Traffic Management Plan (CTMP) that would be prepared prior to construction commencing.

Parking

Site 1

The closure of the Merrylands Station car park for the duration of the construction work would result in the loss of 155 timed and untimed parking spaces and require vehicles that would have used these spaces to park in other locations in the general vicinity of the subject site, which is already at capacity.

The impact of this loss of parking could be reduced through implementation of alternative parking options, which could include:

- construct the angle parking at Site 2 prior to commencing the construction on Site 1 to increase the supply of parking
- use of vacant development land along the northern boundary of the site prior to its development
- lease parking spaces from the private sealed car park located near Gladstone Street
- temporary removal of some of the on-street parking controls within the immediate locality of the railway station to allow for all day commuter parking.

The requirement to allow for the commuter and casual car park use elsewhere within the immediate vicinity of the subject site would be investigated in consultation with Council during the detailed design stage of the Proposal.

Site 2

The length of roadway along Railway Terrace designated to accommodate the angle parking currently caters for four vehicles parked parallel to the kerb. The loss of the spaces can be accommodated within the vicinity where there are on-street parking spaces generally available during the working day.

There is no dedicated motorcycle parking provided in the vicinity of Site 1 or 2, therefore there would be no impact to motorcycle parking during the construction of the site.

Overall, the loss of parking during the construction phase would be a short term impact and temporary in nature. Upon completion of the Proposal, both commuters and the general community would benefit from the provision of additional unrestricted parking and improved amenity within the vicinity of the railway station.

Pedestrians

Site 1

The pedestrian footpath on the east side of Terminal Place would need to be closed at times to pedestrian and bicycle traffic and controlled during construction to ensure safe access for pedestrians, and separation of construction plant and equipment from public traffic and pedestrians. Access to the station would be maintained at all times it is operational.

Site 2

The pedestrian footpath on the west side of Railway Terrace would be realigned in conjunction with the new parking area. During the construction of the car park, the section of the footpath immediately fronting the site would need to be closed. Pedestrian controls would be implemented to direct pedestrians safely around the work site.

Overall, there would be minimal disruption to pedestrian activity during the construction phase. Any measures required for pedestrian safety during the construction phase would be detailed in the construction Traffic Management Plan (TMP).

Cyclists

Site 1

The on road cycle route that runs along Pitt Street and Terminal Place would not be impacted upon by the construction of Site 1. Bike lockers on Terminal Place would not be able to be accessed during the construction work. These lockers may require temporary relocation in the vicinity of the bus interchange. The extent of demand would be determined during the detailed design stage of the Proposal and temporary lockers provided to satisfy this demand. Construction of the Proposal would generally have minimal impacts on cycling.

Site 2

An off-road cycle route that runs along the shared pathway on the western side of Railway Terrace would be realigned in conjunction with the new parking area. Controls would be implemented where required to direct cyclists safely around the work site.

Bus, taxi and kiss and ride

Site 1

Construction of the Proposal would impact upon the existing mail zone / bus zone at the northern end of the Interchange. The works would require the mail zone to be relocated and the bus zone to be reduced in length. This would require consultation with the relevant authorities and bus operators to determine a suitable location for these zones to be relocated or adjusted, as required.

Construction works at Site 1 would impact on the informal kiss and ride in this location. This would require discussion with other stakeholders and the road authority to determine mitigation controls and length of this works zone to minimise disruption for all users.

Site 2

The school bus stop located within the vicinity of Site 2 would be removed, as it is no longer operational.

There are no taxi facilities or kiss and ride facilities at Site 2.

Property access

Construction works at Site 1 and Site 2 are not expected to require any access changes to nearby properties. Access to all private properties and businesses adjacent to the works would be maintained, unless otherwise agreed with the relevant property owners.

b) Operational phase

Vehicle access

Site 1

There would be no change to current entry/exit arrangements. The entry point is located off a one-way road, ensuring that all traffic movements would be a left turn only and visibility at this location for drivers entering the car park ramps is clear.

Access to the additional levels of parking would be via a new driveway off Terminal Place. Ramps would be provided on the southern portion of the site to provide access between all levels.

All traffic exiting the new car park level will drive down a one-way ramp to the existing ground floor level of car parking and then circulate via the existing aisles to utilise the existing exit

ramp from the car park. Traffic movements from this exit ramp are controlled by the existing traffic signals at the intersection of Terminal Place /Merrylands Road and Military Road.

Site 2

The Proposal would extend and formalise the existing kerbside parking along the rail line on Railway Terrace, and would involve construction of additional 90 degree angle parking. The access and connections to the kerbside parking spaces on Railway Terrace are expected to remain the same as the current access arrangements.

Traffic generation and parking demand

Site 1

Site 1 is anticipated to have a strong inbound traffic movement in the morning peak period and a strong outbound movement in the afternoon peak period. Based on the proposed car park providing 220 spaces, the addition of Site 1 represents an increase of 65 movements inbound in the morning local traffic peak hour period and 33 outbound in the afternoon local traffic peak hour period.

The major impact of the traffic movements associated with Site 1 would occur at the existing entry ramp off Terminal Place and the existing exit ramp at the signal controlled intersection with Terminal Place. Site observations show both of these access points currently operate in an efficient manner, with an acceptable LoS for all road users. The increased use of the entry ramp during the morning peak period (arrivals) and the exit ramp in the afternoon peak period (departures) would have a minimal impact upon the overall operation of this length of the road network.

Site 2

The angle parking on Railway Terrace would show a similar travel pattern with traffic arriving in the morning period, parking for the day, and then leaving in the afternoon period. The provision of an additional 20 car parking spaces would generate an additional 20 vehicle movements in the morning peak period and a similar volume in the afternoon peak period.

The additional traffic flows associated with the development of the additional parking spaces would have a minimal impact with the traffic movements continuing to operate at a good level of service. The additional angle parking at Site 2 would operate in a similar manner to the existing parking and is not anticipated to impact upon the operation of the intersections in the general locality of the site.

Intersections within the immediate vicinity of the Merrylands Commuter Car Parks are considered to be operating at an adequate level of service in the peak hour, and are expected to continue to do so with the additional traffic associated with the car parks.

Car parks in their own right are not traffic generators, but rather represent the end point for vehicle movements associated with a generator of traffic. No additional traffic generation is anticipated. The broader road network will not experience significant change, as the vehicles parking in the new facilities would otherwise be parked on-street, having already entered the broader road network.

Potential traffic impacts for Merrylands have therefore been assessed by the application of the Austroads guidelines, to determine the need for a detailed traffic analysis (e.g. Table 2.4 Austroads Guide) as well as consideration of the existing signalised intersection for the current Merrylands Commuter Car Park exit (site 1). Based on these guidelines, the need to undertake detailed (Sidra) modelling is not considered necessary, and this is supported by a peer review of similar assessments of traffic impacts for other similar commuter car parks.

Pedestrians and cyclists

Site 1

Pedestrian access to the railway station would be provided with a direct linkage to the existing interchange forecourt off Terminal Place. The new car park levels would be located at a similar level as the bus interchange so that drivers can exit the car park on foot and connect directly to the bus interchange or station platforms via ramp/stairs or lift.

Assuming a car occupancy rate of 1.2 people per vehicle, pedestrian movements are anticipated to increase by 264 people walking between the car park and the train station in the peak periods. This includes an estimated 83 pedestrian movements between the new levels of parking and the railway station via the interchange concourse level, with the remainder of pedestrians using the direct pedestrian path.

There are currently no cyclist facilities or cycle parking provided within the existing car park. Commuter cyclists are catered for nearer the train station.

Site 2

The angle parking on Railway Terrace is connected to the railway station via an existing at grade footpath that connects directly to the station entry point on the eastern side of the railway line. There is no requirement to cross a road between this parking area and the station. Pedestrian movements are anticipated to increase by 24 pedestrian movements between the car park and the railway station.

Parking for commuter cyclists is available in lockers along Terminal Place adjacent to the bus interchange and station. Cycling commuters are not expected to utilise this new parking area.

Public transport

Site 1

Access to buses and taxis would be maintained in a similar form to present conditions. Overall access to public transport would be maintained.

Site 2

There is currently an unused bus stop located within the vicinity of the new work. This bus stop would be removed in conjunction with the provision of angle parking.

Property access

No access changes to nearby properties would be required for the Proposal.

6.1.3 Mitigation measures

The following mitigation measures are proposed to manage traffic, transport and access impacts:

- alternative parking options to offset the temporary loss of commuter parking during construction would be investigated and reported on during detailed design and construction planning, in consultation with the relevant authorities and the local community. Options for staging of Site 2 works prior to Site 1 must also be considered in order to assist in offsetting commuter parking lost during construction of Site 1. Appropriate alternative parking arrangements would be implemented during construction, where reasonable and feasible.

- assess the demand for temporary bike lockers during detailed design to accommodate the temporary loss of eight bicycle lockers on Terminal Place during construction. Provide temporary lockers as required.
- consult with relevant authorities during detailed design to determine appropriate controls for impacts to the mail zone, bus zone and kiss and ride at Site 1.
- prior to the commencement of construction, a Traffic Management Plan (TMP) would be prepared as part of the CEMP.
- a separate Traffic Control Plan will be prepared for the construction work off Railway Terrace and will address the pedestrian and cyclist movements that currently occur along the footpath across the site frontage to the new parking area.
- construction traffic movements would be scheduled to avoid local traffic peaks.
- access to all private properties and businesses adjacent to the works would be maintained during construction, unless otherwise agreed by relevant property owners.

Refer to Table 33 for a full list of proposed mitigation measures.

6.2 Urban design, landscape and visual amenity

A Visual Impact Assessment (VIA) was undertaken by Envisage for the Proposal (Envisage, 2016) (see Appendix E). The findings of this assessment are summarised in this section.

6.2.1 Existing environment

Landscape character

The dominant character of the surrounding area of Merrylands and both sites is highly urban, consisting of the low-scale commercial centre to the west and a mix of older-style detached housing interspersed with contemporary residential flat buildings up to six and eight storeys high on the eastern side. Running through the centre is the railway corridor with a linear infrastructure character.

Site 1 is within the main station precinct which has an urban character dominated by the concrete built elements of the large bus interchange and the elevated concourse of the station, surrounded by the hard surfaces of the existing car park and the station forecourt. There is limited vegetation around the western side of the station, the exception being a cluster of tall, native Cabbage Tree Palms in the station forecourt and a second cluster of palms along Terrace Place in front of the bus interchange.

Site 2 is along Railway Terrace north of the vehicular overbridge at Neil Street. This location has a local street residential character with mostly detached housing and tall, native street trees. The railway corridor can be seen along the western side of the street with taller residential flat buildings seen behind.

Visual receivers

Both sites have a relatively confined area of visibility. Site 1 is largely concealed behind the existing bus interchange and visibility would be confined to the immediate areas around the bus interchange and station forecourt, the station concourse, Neil Street, vacant land to the north and from the taller residential flat buildings on the eastern side of the railway corridor (see Figure 18).



Figure 18 Site 1 visual analysis and key viewpoints

The visibility of Site 2 is mostly limited to users and residents of the nearest parts of Railway Terrace, with more distant views possible from surrounding taller residential flat buildings on the western side of the railway corridor.

6.2.2 Potential impacts

a) Construction phase

There would be temporary works (as required) during construction at both Site 1 and Site 2. The sites would be fenced/screened off and public access prevented during that time. A construction compound would be established along the northern part of the site for Site 1 and the southern part of the site for Site 2. Typical elements would include temporary fencing, stockpiling of materials and construction equipment. These changes would be temporary and therefore not have a long term visual impact.

b) Operational phase

Landscape character

Site 1:

The Proposal at Site 1 would replace the existing at-grade car park with a structure of three additional part levels which would be of a height similar to the bus interchange on the boundary. The Proposal would introduce a slightly larger scale built element than the existing car park, as well as a new lift near the station entry.

The overall effect would be compatible with the already substantially urban character and not of a high contrast. In general there would be a low magnitude of change to the landscape character associated with the Proposal.

Site 2:

The Proposal at Site 2 would result in the removal of a section of grassed verge (about 80m long by 10m wide) along the western side of Railway Terrace. It would look similar to other existing car parks of the same design between Site 2 and Merrylands Station along Railway Terrace. The Proposal would mean a slight increase in built elements due to the loss of the grassed area.

The change would be compatible with the surrounding urban character of this part of Railway Terrace and not result in a loss of any trees, with the existing trees just to the north being a visual asset along this local street.

Visual impacts

Site 1:

The Proposal would visually replace the existing views of the at-grade car park with the new three part level structure at Site 1. Views were assessed for Merrylands Station. This view is available from the western station forecourt and western side of the concourse. Due to its public nature and high number of users the visual sensitivity of the viewpoint is low.

Photos of the existing views and a photomontage showing the altered views due to the Proposal are provided in Figure 19 and Figure 20, respectively (views to the north) and Figure 21 and Figure 22 (views to the south). The new lift shaft would appear in the foreground of the view with the car park seen behind at the rear of the bus interchange. Once constructed the new structure would blend with the existing bus interchange with the lift shaft being the most notable new feature. Taking these changes into consideration, and the context of the surrounding area, the magnitude of visual change would be low.

Site 2:

The only key viewpoints of Site 2 are those available from Railway Terrace, incorporating both public viewers using the street and residential viewers along the opposite side of Railway Terrace (see Figure 23). There would be no views possible for pedestrians from the Neil Street overbridge, as the pedestrian path is on the opposite side, and vehicle users would be unlikely to notice any change due to the very short time to see the view and the angle. The design is similar to other street side car parking areas along Railway Terrace closer to the station and with no trees requiring removal; the general visual impact is anticipated to be minor.

Other potential viewpoints on the western side of the railway (e.g. from the existing residential flat buildings) are a substantial distance away and have therefore not been assessed.



Figure 19 View of the proposal area (Site 1) adjacent to the bus interchange, looking north



Note: Indicative of bulk and scale only – subject to detailed design

Figure 20 Photomontage view towards the proposal area (Site 1) adjacent to the bus interchange, looking north



Figure 21 View of existing car park entry (Site 1) from Terminal Place, looking south



Note: Indicative of bulk and scale only – subject to detailed design

Figure 22 Photomontage view towards the Proposal (Site 1) from Terminal Place, looking south

(The car park design has changed slightly since this image was prepared but in general the look of the new car park entry, as seen from Terminal Place, is consistent with that shown.)



Figure 23 Proposal area (Site 2) along Railway Terrace

Lighting

The Proposal would include the installation of lighting for operational, safety, security and maintenance purposes. It is anticipated that night lighting would include building and pole mounted directional spot lighting and pole mounted pedestrian lighting. The majority of areas impacted by infrastructure associated with the Proposal would be unlikely to require additional lighting, or lighting that would result in a direct line of sight from surrounding view locations. Installation of lighting would be in accordance with the *AS 4282:1997 Control of the Obtrusive Effects of Outdoor Lighting*, and would avoid light spill to adjoining road corridors and residential areas.

6.2.3 Mitigation measures

The overall visual impacts of the Proposal range from low to negligible for the surrounding receiver locations.

The Proposal, including detailed design elements, would be undertaken with reference to the recommendations included in the Visual Impact Assessment (Envisage, 2016), including:

- an Urban Design Plan (UDP) would be prepared by the Contractor at the 30% design stage of detailed design, in consultation with Cumberland Council, and submitted to TfNSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design
- a Public Domain Plan (PDP) would be prepared by the Contractor at the 30% design stage of detailed design, in consultation with Cumberland Council, and submitted to TfNSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design

- worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations
- light spill from the construction area into adjacent visually sensitive properties would be minimised by:
 - directing construction lighting into construction areas and ensuring the site is not over-lit
 - the sensitive placement and specification of lighting to minimise any potential increase in light pollution
 - design and installation of all lighting in accordance with the requirements of *AS4282 Control of the Obtrusive Effects of Outdoor Lighting*.
- retaining and protecting existing trees where practicable including consultation with a qualified arborist to minimise impact on the long term health of any nearby trees that could be or are planned to be retained
- rehabilitation of disturbed areas
- installation of way-finding signage as per TfNSW guidelines
- removal of temporary hoardings, barriers, traffic management and signage when no longer required
- during construction graffiti would be removed in accordance with TfNSW' s standard mitigation measures. Hoardings, site sheds, fencing, acoustic walls around the perimeter of the site and any structures built as part of the Project are to be maintained free of graffiti and advertising not authorised by the Proponent during the construction period. Graffiti and unauthorised advertising will be removed or covered within the following timeframes:
 - Offensive graffiti will be cleaned or covered within 24 hours
 - Highly visible yet non-offensive graffiti will be cleaned or covered within 1 week
 - Graffiti that is neither offensive nor highly visible will be cleaned or covered during normal operations within one month.
 - Any advertising material will be removed or covered within 24 hours.

Measures to mitigate visual impacts during construction would be included in a CEMP for the Proposal. Refer to Table 33 for a full list of proposed mitigation measures.

6.3 Noise and vibration

An environmental Noise and Vibration Impact Assessment (NVIA) was undertaken by Wilkinson Murray in March 2016 for the Proposal (Wilkinson Murray, 2016) (see Appendix F). The findings of this assessment are summarised below.

The assessment included:

- identifying sensitive noise receivers
- undertaking attended and unattended background noise monitoring
- establishing the noise and vibration assessment criteria
- establishing construction vibration criteria
- predicting the noise and vibration impacts from the proposed upgrade works to representative sensitive receivers

- assessing potential construction noise and vibration impacts by comparing predictions with established criteria
- providing recommended mitigation measures to minimise noise and vibration impacts.

6.3.1 Existing environment

Noise sensitive receivers

Four locations were chosen for background monitoring (one commercial and three residential) to represent sensitive receivers due to their proximity to the Proposal. Each one represents a broader area of potentially sensitive receivers within their sensitive receiver type. Figure 24 shows the nearest sensitive receivers to the Proposal and the attended noise monitoring locations used for the NVIA. Receiver types and distances from the Proposal are listed in Table 10.

The following land uses surround the proposed car parks:

Site 1:

- Commercial premises to the north and west of Site 1, with rail corridor to the east. Receiver R1 has been identified as the most potentially affected commercial receiver, located about 35 metres from the northern boundary of the Proposal.
- Multi-storey apartment buildings located east and south of Site 1. Receiver R2 has been identified as the most potentially affected residential receiver, located about 42 metres from the eastern boundary of Site 1.
- Additionally, the Merrylands Railway Station Building adjacent to Site 1 is considered to be sensitive to potential vibration impacts as it is located close to the proposed construction.

Site 2:

- Site 2 is surrounded by residential premises to the east and north-west and is bound by the rail corridor to the west. The receivers that are potentially most affected by noise from the proposed car park are residences located to the east and north-west, defined as R3 and R4 respectively.



Figure 24 Sensitive receivers and attended monitoring locations relative to the Proposal

Table 10 Sensitive receivers near the Proposal (Site 1)

Receiver No.	Type	Distance to Site Boundary (m)	Address	Description
R1	Commercial	35	Pitt Street, Merrylands	1-storey structure
R2	Residence	42	Railway Terrace, Merrylands	7-storey building

Table 11 Sensitive receivers near the Proposal (Site 2)

Receiver No.	Type	Distance to Site Boundary (m)	Address	Description
R3	Residence	26	Railway Terrace, Granville	3-storey building
R4	Residence	56	Brickworks Drive, Holroyd	7-storey building

Background noise levels

Existing noise levels (prior to construction of the Proposal) are measured to understand existing ambient noise levels and their sources, which inform the assessment of potential noise impacts from the Proposal.

Rating Background Noise Levels (RBLs) are determined from measurement of L_{A90} noise levels (representing the noise level exceeded for 90 per cent of the monitoring period) in the absence of noise from the Proposal. To determine the RBLs, noise monitoring was undertaken in the vicinity of the sites at locations shown in Figure 24. The equivalent continuous sound level (L_{Aeq}) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

Attended short-term (15 minute) noise monitoring was undertaken at the following locations:

- MM1: Day-time measurements were carried out at the commercial premises located to the west of the Site 1
- MM2: Both day-time and night-time measurements were carried out at the residence located to the east of Site 2.

The results of the attended noise monitoring are provided in Table 12. Distant traffic, breeze and insect noise were found to be the primary sources of noise.

Unattended long-term noise monitoring was undertaken at the following locations:

- MM2: Unattended noise monitoring was undertaken at the front of the residence located to the east of Site 2 between 2 March 2016 and 7 March 2016. As construction works are currently taking place to the east of Site 1, long-term noise monitoring was not conducted in this area.

The results of unattended long-term monitoring at location MM2 are provided in Table 13. The table gives the RBLs for standard periods, daytime, evening and night time, as well as the shoulder period from 6am to 7am and 6pm to 7pm for weekdays.

In the absence of long-term measurement data close to location R2, measurements at location MM2 have been used to define daytime and shoulder period criteria. These are considered to

be conservatively low, as daytime L_{A90} levels measured at location MM1 from short-term measurements are higher than the measured RBL at location MM2.

Table 12 Existing background and ambient noise levels

Monitoring Location	Time	Rating Background Level (L_{A90})	Ambient noise level (L_{Aeq})	Notes
MM1	Day	54	66	Background noise levels dominated by distant traffic.
MM2	Day	45	55	Background noise levels dominated by distant traffic and breeze
MM2	Night	38	63	Background noise levels dominated by insects. Industrial noise inaudible.

Note: Daytime 7am–6pm (or 8am–6pm Sundays and public holidays), Evening 6–10pm and Night 10pm–7am (or 10pm–8am Sundays and public holidays).

Table 13 Measured Rating Background Levels (RBLs), dBA

Monitoring Location	Daytime (7am–6pm)	Evening (6–10pm)	Night Time (10pm–7am)	Early Morning Shoulder (6–7am) Weekday	Early Evening Shoulder (6–7pm) Weekday
MM2	43	48	42	47	48

Construction noise criteria

Residential criteria

Noise management levels (NMLs) in the NVIA were determined for the nearest receivers consistent with the NSW *Interim Construction Noise Guideline* (ICNG) (Department of Environment and Climate Change, 2000). The ICNG provides a framework to consider the impacts of construction noise on residences and other sensitive land uses.

A $L_{Aeq(15min)}$ NML is defined for residential receivers as the rating background level (RBL) + 10 dBA. Where construction noise exceeds this level it is assumed there may be some community reaction to construction noise. The calculated NMLs for the daytime construction works at the nearest residential receivers are provided in Table 14.

Where the predicted construction noise levels exceed the NML, all feasible and reasonable work practices should be applied to minimise the potential noise impacts. Where $L_{Aeq(15min)}$ construction noise levels are predicted to exceed 75 dBA, a receiver is considered “highly noise affected” and additional mitigation measures (such as implementation of respite periods) may be required.

Table 14 Construction noise management level - residential receivers (Site 1)

Receiver	Day time (7am–6pm)	Evening (6–10pm)	Night (10pm–7am)
R2	53	53	47

Table 15 Construction noise management level - residential receivers (Site 2)

Receiver	Day time (7am–6pm)	Evening (6–10pm)	Night (10pm–7am)
R3, R4	53	53	47

Non-residential criteria

The noise management levels from the TfNSW’s *Construction Noise Strategy* (CNS) are the same as for the ICNG. The ICNG has the following recommended NMLs for commercial and industrial premises:

- industrial premises: external $L_{Aeq}(15\text{minute})$ 75 dBA
- offices, retail outlets: external $L_{Aeq}(15\text{minute})$ 70 dBA

The CNS recommends providing regular updates to neighbouring businesses to inform them of the construction schedule.

Based on the above, the NML for R1 at Site 1 is 70 dBA.

No schools or child care centres have been identified in the immediate vicinity of Site 2.

Sleep disturbance criteria

Operations during the night have the potential to disturb people’s sleep patterns. The *Industrial Noise Policy* (INP) (EPA, 2000) refers to the *Road Noise Policy* (RNP) (EPA, 2013), with both documents discussing criteria for the assessment of sleep disturbance.

The RNP suggests a screening level of $L_{1,1\text{min}}$ dBA, equivalent to the RBL + 15 dB, below which sleep disturbance is unlikely. Where this level is exceeded, further analysis should be carried out. Furthermore, Section 5.4 of the RNP states that:

- maximum internal noise levels below 50 to 55 dBA would be unlikely to result in people’s sleep being disturbed
- if the noise exceeds 65 to 70 dBA once or twice each night the disturbance would be unlikely to have any notable health or wellbeing effects.

Based on the above, the sleep disturbance criteria are shown in Table 16 and Table 17.

Table 16 Sleep disturbance screening criteria, $L_{A1,1\text{min}}$, dBA (Site 1)

Receiver	Night Time (10pm–6am) RBL+15dBA	Early Morning Shoulder (6–7am) Weekday RBL+15dBA
R2	57	62

Table 17 Sleep disturbance screening criteria, LA_{1,1min}, dBA (Site 2)

Receiver	Night Time (10pm–6am) RBL+15dBA	Early Morning Shoulder (6–7am) Weekday RBL+15dBA
R3, R4	57	62

Standard working hours

The ICNG recommends that, as far as practicable, construction activities are undertaken between the standard hours of work. All works required for the Proposal would be undertaken during standard construction hours, as far as practicable. Standard construction hours are:

- Monday to Friday 7am–6pm
- Saturday 8am–1pm
- No work on Sundays or Public Holidays.

Where out-of-hours work is required, and noise levels exceed the RBL (defined for residential receivers as the rating background level (RBL) + 5 dBA in accordance with the ICNG), then separate TfNSW approvals (via TfNSW’s Out-of-Hours Work Application Form) would need to be obtained.

Construction Vibration Criteria

When assessing vibration there are two categories of vibration criteria. One is related to the impact of vibration to human comfort and one is related to the impact on building structures (cosmetic damage). The safe working distances for vibration producing construction equipment are provided in Table 18. These are based on the planned equipment that would be used during each construction phase, and based on CNS recommendations.

Table 18 CNS recommendations for safe working distances for vibration-intensive plant

Plant Item	Rating / Description	Cosmetic Damage (BS 7385)	Human Response (OH&E Vibration Guideline)
Vibratory Roller	< 50 kN (typically 1-2 tonnes)	5m	15m – 20m
Vibratory Roller	< 100 kN (typically 2-4 tonnes)	6m	20m
Vibratory Roller	< 200 kN (typically 4-6 tonnes)	12m	40m
Vibratory Roller	< 300 kN (typically 7-13 tonnes)	15m	100m
Vibratory Roller	> 300 kN (typically 13-18 tonnes)	20m	100m
Vibratory Roller	> 300 kN (> 18 tonnes)	25m	100m
Small Hydraulic Hammer	(300kg – 5-12t Excavator)	2m	7m
Medium Hydraulic Hammer	(900kg – 12-18t Excavator)	7m	23m
Large Hydraulic Hammer	(1,600kg – 18-34t Excavator)	22m	73m

Vibratory Pile Driver	Sheet piles	2m – 20m	20m
Pile Boring	≤ 800mm	2m (nominal)	N/A
Jackhammer	Hand held	1m (nominal)	Avoid contact with structure

Operational noise criteria

The *Industrial Noise Policy* provides guidance in relation to acceptable noise limits for industrial noise emissions, which includes, but is not limited to, noise emissions from mechanical plant.

The assessment procedure in the INP (EPA, 2000) has two components:

- controlling intrusive noise impacts in the short-term for residences
- maintaining noise level amenity for residences and other land uses.

The intrusiveness criterion of the INP is that noise from a site should not exceed the background noise level plus 5dBA when measured over a 15-minute period ($L_{Aeq,15\text{ min}}$). Intrusiveness criteria for noise from the car park operation at residential receivers are given in Table 19.

Note that location MM2 has been used to define daytime and shoulder period criteria. These are considered to be conservatively low, as daytime L_{A90} levels measured at location MM1 from short-term measurements are higher than the measured RBL at location MM2. If noise compliance is achieved during the daytime periods, noise levels would readily comply with the evening and night time criteria. This is due to the minimal movements expected in the car park between 7pm and 6am.

Table 19 Intrusiveness criteria, $L_{Aeq,15\text{ min}}$, dBA (Site 1)

Receiver	Daytime (7am–6pm)	Early Morning Shoulder (6–7am) Weekday	Early Evening Shoulder (6–7pm) Weekday
R2	48	52	53

Table 20 Intrusiveness criteria, $L_{Aeq,15\text{ min}}$, dBA (Site 2)

Receiver	Daytime (7am–6pm)	Early Morning Shoulder (6–7am) Weekday	Early Evening Shoulder (6–7pm) Weekday
R3, R4	48	52	53

The applicable criterion for the commercial receiver R1 is 65 dBA L_{Aeq} for the daytime period as identified in the INP.

The criteria for sleep disturbance due to short-term noise are shown in Table 21.

Table 21 Sleep disturbance screening criteria, $L_{A1,1\text{ min}}$, dBA (Site 1)

Receiver	Night Time (10pm–6am)	Early Morning Shoulder (6am–7am) Weekday
R2	57	62

Note: R1 is excluded as sleep disturbance criteria is not applied to commercial premises

Table 22 Sleep disturbance screening criteria, $L_{A1,1min}$, dBA (Site 2)

Receiver	Night Time (10pm–6am)	Early Morning Shoulder (6am–7am) Weekday
R3, R4	57	62

6.3.2 Potential impacts

a) Construction phase

Noise

Predicted noise levels

Site 1

Table 23 gives the NML and the predicted range of noise that each of the representative receivers at Site 1 would experience during construction. Predicted noise levels were the same for construction during standard hours and outside standard hours (excluding night).

Table 23 NMLs and predicted noise levels ($L_{Aeq,15min}$ dBA) during construction (Site 1)

Construction Phase	Standard Hours		Outside Standard Hours (Excluding Night)	
	R1 (NML 70dBA)	R2 (NML 53dBA)	R1 (NML 70dBA)	R2 (NML 53dBA)
Phase 1 – Establishment of site compound	64-71	66-70	64-71	66-70
Phase 2 – Removal of vegetation	70-77	72-76	70-77	72-76
Phase 3 – Demolition of existing structure and site clearing	76-83	78-82	76-83	78-82
Phase 4 – Relocation of services and preparation of substructure	65-72	67-71	65-72	67-71
Phase 5 – Construct floor slabs, columns and walls	67-74	69-73	67-74	69-73
Phase 7 – Construction of external cladding	68-75	70-74	68-75	70-74
Phase 8 – Installation of bicycle racks, wayfinding signage, landscaping etc.	62-69	64-68	62-69	64-68

Phase 9 – Construction of external road works and footpaths	69-78	67-74	69-78	67-74
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Note: Phase 6 has been excluded from this table as it would generate a minor noise impact at all receivers.

Note: Noise levels in red indicate an exceedance of the NML.

Table 19 gives the NML and the predicted range of noise that each of the representative receivers at Site 1 would experience during night time construction.

Table 24 NMLs and predicted noise levels ($L_{Aeq,15min}$ dBA) during night time construction (Site 1)

Construction Phase	R1 (NML 70dBA)	R2 (NML 53dBA)
Phase A – Lifting of bridge span/lift into position	70-77	72-76
Phase B – Construction of anti-throw screens or canopies	66-73	68-72

Note: Phase 6 has been excluded from this table as it would generate a minor noise impact at all receivers.

Note: Noise levels in red indicate an exceedance of the NML.

Construction noise levels at the assessed representative residential receivers are predicted to exceed the NMLs by up to 29 dBA at receiver R2. Noise levels would exceed the “highly impacted” level of 75dBA for activities such as removal of vegetation, demolition of existing structure and road works.

In addition, construction works carried out during the night are predicted to exceed the NML at all considered receivers.

For standard hours work, the CNS would recommend letterbox drops (LB) to potentially affected residents and monitoring (M) for all operations, as noise levels would exceed the RBL by more than 20dB.

For non-standard hours, receiver R2 should also be considered for individual briefing (IB), phone calls (PC) and specific notifications (SN) during demolition of existing structure and site clearing. In addition to the previous recommendations, receiver R2 exposed to noise generated by night time works should be considered for alternative accommodation (AA) and project specific respite offers (RO).

Noise levels could exceed 70dBA at receiver R1 during the majority of the phases of construction works. As required by the CNS, it is recommended that neighbouring business be regularly updated with the construction schedule.

Site 2

Table 25 gives the predicted noise levels at representative receivers at Site 2 during standard construction hours.

Table 25 NMLs and predicted noise levels ($LA_{eq,15min}$ dBA) during standard hours construction (Site 2)

Construction Phase	R3 (NML 53dBA)	R4 (NML 53dBA)
Phase 1 – Establishment of site compound	68-74	63-67
Phase 2 – Removal of vegetation (turf)	67-73	62-66

Phase 3 – Demolition of kerb line and footpath	75-81	70-74
Phase 4 – Services relocation	73-79	68-72
Phase 5 – Construction of asphalt paving and footpath	69-76	64-66
Phase 7 – Installation of wayfinding signage	58-64	53-57

Note: Phase 6 has been excluded from this table as it would generate a minor noise impact at all receivers.

Note: Noise levels in red indicate an exceedance of the NML

No works outside of standard construction hours are anticipated.

Construction noise levels at the assessed representative residential receivers are predicted to exceed the NMLs by up to 28 dBA at receiver R3 and by up to 21 dBA at receiver R4. Noise levels would exceed the “highly impacted” level of 75dBA at R3 for activities associated with demolition of kerb line and footpath, services relocation and construction of asphalt paving and footpath. Receiver R4 is slightly less impacted as it is further from Site 2 and would not be exposed to noise levels above 75 dBA.

For standard hours work, the CNS would recommend letterbox drops (LB) to potentially affected residents and monitoring (M) for all operations, as noise levels would exceed the RBL by more than 20dB. Respite periods should also be provided.

The ICNG recognises that by necessity construction works must sometimes be undertaken outside of the standard recommended hours. More stringent noise goals apply during out-of-hours works. If out-of-hours work is required, a separate approval would be applied for through TfNSW and further mitigation measures considered in accordance with the *Construction Noise Strategy* (CNS).

Vibration

Predicted vibration

For works other than those requiring vibratory rollers or hydraulic hammers, the vibration is predicted to be below the criteria for human comfort at all receivers. No activity would cause vibration likely to cause building damage at residential or commercial receivers.

For work using a hydraulic hammer or vibratory roller, work may cause vibration levels exceeding the criterion for continuous vibration at residential receivers. In general, any work near a receiver would be temporary and intermittent.

The structure associated with the Merrylands Station has been assessed against the building damage criteria for heritage buildings. Special attention should therefore be given to any construction works to be undertaken within 10 metres from the façade of any heritage-listed station buildings. If hydraulic hammers or vibratory rollers are to be used within 10 metres, vibration monitoring should be undertaken. In addition, the following plant items must be used:

- vibratory roller no greater than 50 kN (typically 1-2 tonnes) and small hydraulic hammer no greater than 300kg (5-12t excavator).

Regarding “Human Response” the use of some items listed in Table 18 might exceed the criteria for human comfort. Based on a consideration of the safe working distances in Table 18, the following equipment is recommended to be used so as to minimise the risk of human discomfort being caused by certain activities:

- Site 1: vibratory roller no greater than 200 kN (typically 4-6 tonnes) and medium hydraulic hammer no greater than (900kg – 12-18t excavator).

- Site 2: vibratory roller no greater than 100 kN (typically 2-4 tonnes) and medium hydraulic hammer no greater than (900kg – 12-18t excavator).

With the above equipment, predicted vibration levels remain below the criteria for human comfort. If it proves impractical to use this equipment, the additional mitigation measures listed in the CNS would be undertaken including letterbox drops. Monitoring is recommended at receiver R3 for work using a hydraulic hammer or vibratory roller to ensure limits for human comfort are not exceeded.

b) Operational phase

Noise

Vehicle noise

The predicted operational noise levels at the representative residential receivers during peak hour, compared to the criteria, are given in Table 26. The predicted noise levels comply with noise criteria at all times.

Table 26 Predicted operational noise levels, $L_{Aeq,15min}$, dBA versus criteria during peak hours (Site 1)

Monitoring Location	Predicted Noise Level	Early Morning Shoulder Criteria (6–7am)	Daytime Criteria (7am–6pm)	Early Evening Shoulder Criteria (6–7pm)
R2	44	52	48	53

Table 27 Predicted operational noise levels, $L_{Aeq,15min}$, dBA versus criteria during peak hours (Site 2)

Monitoring Location	Predicted Noise Level	Early Morning Shoulder Criteria (6–7am)	Daytime Criteria (7am–6pm)	Early Evening Shoulder Criteria (6–7pm)
R3	38	52	48	53
R4	32	52	48	53

The amenity assessment for commercial receiver R1 is based on the total noise through the day, evening and night time periods. Most noise comes from the car park during the peak traffic periods, so the noise emission in the worst-case hours would be higher than the overall noise during the day, evening or night periods. Noise levels at commercial receiver R1 were predicted to be $L_{Aeq,15min}$ of 40dBA. As this noise level represents the worst case scenario for a 15-minute period, compliance with the amenity criteria of 65 dBA at any time period would be readily achieved.

Mechanical ventilation would be required for the Communications Room, given the nature of the partially enclosed car park. Dependent on final design, it is also possible that natural ventilation would need to be supplemented with mechanical ventilation. Should this be the case, any noise impacts would be subject to an operational noise assessment that would be required as part of the Conditions of Approval for the Proposal.

Sleep disturbance

The typical maximum noise level associated with patrons in the car park including doors closing, engine starting and car accelerating is a level of 70 dBA at 7m ($L_{A,w1,1min}$ 95dBA).

The predicted noise levels and relevant sleep disturbance criteria are given in Table 28. The predicted noise levels comply with sleep disturbance noise criteria at all times.

Table 28 Sleep Disturbance Predicted Levels, $L_{A1,1min}$, dBA (Site 1)

Receiver	Predicted Noise Level	Night time (10pm–6am) RBL+15bBA	Early Morning Shoulder Criteria (6– 7am) RBL + 15dBA
R2	54	57	62

Note: R1 is excluded as sleep disturbance criteria is not applied to commercial premises

Table 29 Sleep Disturbance Predicted Levels, $L_{A1,1min}$, dBA (Site 2)

Receiver	Predicted Noise Level	Night time (10pm–6am) RBL+15bBA	Early Morning Shoulder Criteria (6– 7am) RBL + 15dBA
R3	57	57	62
R4	51	57	62

Vibration

The use of the car parks by light vehicles would generate a negligible vibration impact.

6.3.3 Mitigation measures

The following mitigation measures would be implemented:

- prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Construction Noise Strategy* (TfNSW, 2012c) and the Noise and Vibration Impact Assessment (Wilkinson Murray, 2016). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable and implementing mitigation and management in accordance with the CNS.
- surveys of nearby sensitive buildings would be carried out in order to assess the potential for increased susceptibility to building damage from vibration. Should these buildings be considered more susceptible to vibration, reduced vibration criteria levels may be applicable and subsequently adopted during the selection process for suitable equipment to be used in the vicinity of these buildings
- a noise monitoring program would be carried out for the duration of the works in accordance with the CNVMP prepared for the Proposal, and any approval and licence conditions
- vibration monitoring would be undertaken at receiver R3 for work using a hydraulic hammer or vibratory roller to ensure limits for human comfort are not exceeded.
- an Operational Noise and Vibration Impact Assessment (ONVIA) would be undertaken during the detailed design phase to confirm predictions of operational noise levels based on detailed design

- the ONVIA would also assess potential noise impacts of the operation of mechanical equipment required for the Proposal (i.e. mechanical ventilation and stormwater pumps)
- further analysis would be undertaken at a detailed design stage to identify the noise contribution from cars accelerating on access ramps as this is highly dependent on the detailed design
- operation of the car park would be undertaken in a manner that achieves sleep disturbance criteria as per guidance in the INP and RNP and comply with the amenity or intrusiveness criteria (whichever is assessed as more stringent) as per the INP
- following commencement of operation, noise monitoring will be undertaken to verify the predicted operational noise levels. Operational monitoring shall be determined by an independent acoustic engineer accredited by the Association of Australian Acoustic Consultants (AAAC) or environmental specialist acceptable to TfNSW. All reasonable and feasible additional noise mitigation or management measures that are necessary to reduce noise levels or minimise impacts would be undertaken.
- during construction, suitable measures would be put in place to ensure the retained heritage elements are protected from damage. Measures may include hoardings, use of spotters during the movement of equipment and other measures as necessary.
- to effectively mitigate potential impacts of vibration on the Merrylands Railway Station heritage building, activities that cause vibration would be managed in accordance with German Standard DIN 4150 – Part 3 (DIN 1999) heritage specifications. Real time vibration monitoring would be conducted at commencement of relevant works to confirm compliance with the German Standard DIN 4150. If vibration levels approach the determined trigger level, then the construction activity would cease and the heritage structure would be assessed and alternative construction methodologies developed, where practicable, before construction recommences.

Refer to Table 33 for a full list of proposed mitigation measures.

6.4 Indigenous heritage

6.4.1 Existing environment

A search of OEH's AHIMS Web Services (Aboriginal Heritage Information Management System) was undertaken on 19 February 2016. This search indicated that no Aboriginal sites are recorded in or near the Proposal area within 200 metres, and no Aboriginal places have been declared in or near the Proposal.

The Proposal is located in an area that has been highly modified for a range of uses. Previous construction and use of the area for the existing car park and road reserve would have resulted in significant disturbance to the site.

The work area is located approximately 250 metres southwest from A'Becketts Creek, 700 metres north-west of Duck Creek and 3 kilometres south of the Parramatta River. This landscape does not constitute a sensitive landscape as defined in the Due Diligence Code of Practice for the Protection of Aboriginal Objects.

The site has low archaeological potential and therefore it is considered unlikely that any Indigenous heritage items would be located in the vicinity of the Proposal, due to the past history of disturbance.

6.4.2 Potential impacts

a) Construction phase

No Aboriginal sites have been recorded within or in the vicinity of the work area and the work area is not located within a landscape feature likely to indicate the presence of Aboriginal objects in accordance to the Due Diligence Code.

The Proposal is considered unlikely to affect Indigenous heritage during construction.

b) Operational phase

The clear and observable disturbance to the area as a result of previous construction, use and removal of industrial structures and construction of the bus interchange will have resulted in the removal of, or significant disturbance to, the natural soil profile and thus the loss of any soil profile integrity.

The Proposal is considered unlikely to affect Indigenous heritage during operation.

6.4.3 Mitigation measures

The following mitigation measures are proposed to manage impacts to indigenous heritage:

- 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 indigenous cultural heritage material and places to both the Indigenous and Non-indigenous community, as well as the legal implications of removal, disturbance and damage to any indigenous cultural heritage material and sites
- if unforeseen Indigenous objects are uncovered during construction, the procedures contained in TfNSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2015a) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, 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.

Refer to Table 33 for a full list of proposed mitigation measures.

6.5 Non-Indigenous heritage

Artefact Heritage (Artefact) prepared a heritage assessment and associated Statement of Heritage Impact (SoHI) in March 2016 (Artefact, 2016) to identify heritage items that may be impacted by the Proposal, determine the level of heritage significance of each item, assess any potential impacts to those items and recommend mitigation measures to reduce the level of heritage impact (see Appendix G). The SoHI was prepared consistent with the NSW Heritage Office's *NSW Heritage Manual* and related document *Statements of Heritage Impact* (OEH, 2002). A site inspection by a qualified heritage specialist was conducted on 16 February 2016.

6.5.1 Existing environment

Listed heritage items

Statutory registers provide legal protection for heritage items. In NSW, the Heritage Act and the EP&A Act provide for heritage listings. The State Heritage Register, the s170 Heritage and Conservation Registers, and environmental heritage schedules of Local Environment Plans (LEPs) are all statutory listings. Places on the World, National and Commonwealth Heritage Lists are protected under the EPBC Act 1999 (EPBC Act). In addition, there are a number of non-statutory heritage registers.

A search of all relevant heritage registers was undertaken on 19 February 2016. The results are displayed in Table 30 and Table 31, and the curtilages of identified items are provided in Figure 25.

Site 1 is adjacent to Merrylands Station, which is listed as a heritage item in two statutory registers. Site 1 extends into the s170 heritage curtilage of Merrylands Station. The LEP curtilage and listing for 'Merrylands Station' is unclear as the curtilage is located across the railway line, but it is assumed it relates to the Merrylands Railway Station Building as this is the building of historical significance.

There are two heritage items located in proximity to Site 2 (Figure 25).

Table 30 Historic register search for Merrylands Station

Register	Listing (and number)
Register of the National Estate (non-statutory)	No
National Heritage List	No
Commonwealth Heritage List	No
State Heritage Register	No
RailCorp s170 Heritage and Conservation Register	Yes (4801921)
Holroyd LEP 2013	Yes (I71)

Table 31 Details of other listed heritage items in proximity to the Proposal

Suburb	Item name	Address	Property description	Significance	Item listing number
Merrylands	Millmaster Feeds Site (archaeological)	1–7 Neil Street	Lot 11, DP 228782	Local	Holroyd LEP 2013 A5
Holroyd	Goodlet and Smith (brickmaking plant and chimney and Hoffman kiln and chimney)	23–25 Brickworks Drive	Lots 1001 and 1002, DP 1037793	Local	Holroyd LEP 2013 I53



Figure 25 Listed heritage items adjacent and in proximity to the site

Historical background

Merrylands Station opened in 1878 along the Main Southern Line between Parramatta and Liverpool. Merrylands was named after the English home of politician and explorer Arthur Todd Holroyd, who acquired land in the area in 1855. Parish maps indicate the station was built on land that was originally granted to Richard Atkins and John Bowman. With the opening of the railway station, land surrounding the area was subdivided for housing and small farms. Moderate estates were advertised in the 1880s, using the proximity to the station as a selling point. By this time, the pottery and brick making industry was flourishing and larger facilities were constructed, such as the Goodlet and Smith Brickworks. The station and railway line provided services to these industries, with private sidings constructed to facilitate the movement of goods. A goods yard and residence dating to the nineteenth century was situated next to the station where the current station car park is located. A goods siding was located near the station to serve McLeod's Flour Mill in 1926 that was located to the north-west. Merrylands Station has undergone continuous development, with the 1940s building on platform 1 retaining its historic significance (Artefact, 2016).

Heritage significance

Merrylands Railway Station Building

Merrylands Railway Station Building is listed on the RailCorp s170 register and Holroyd LEP 2013 as having local significance. The current station buildings are mostly modern, except for the 1940s building on platform 1 which retains its historic significance. This building is an example of Inter War Stripped Functionalist style that was prominent at the time. Its construction reflects the Department of Railways' policy of building substantial structures for the suburban area in the 1930s. This structure was built using State funding and contrasts with the larger buildings between Westmead and Seven Hills, which were funded by the Commonwealth during World War II (Artefact, 2016).

Millmaster Feeds Site (archaeological)

Millmaster Feeds site was the location of one of two flour mills located adjacent to the railway line near Merrylands. It was constructed between 1901 and 1925, with mill buildings and silos. The site is now cleared but is an archaeological site with local significance.

Goodlet and Smith (brickmaking plant and chimney and Hoffman kiln and chimney)

The remains of the Goodlet and Smith brick making plant, chimneys and kiln, were part of the original cement, brick and tile works on the site. It was founded in 1884 by John Haye Goodlet. The site has been redeveloped to accommodate new housing, retaining historic elements within the estate.

Archaeological potential

Site 1 has been previously disturbed by modern development with the construction of the current car parking facility, which is below ground level, and has a stormwater drain running underneath. Owing to the disturbance of the site through the development of the current car park and the bus interchange, Site 1 has nil-low archaeological potential.

No evidence has been found to indicate any previous development on Site 2 apart from features associated with the adjacent railway line and road. The archaeological potential of Site 2 is nil-low.

6.5.2 Potential impacts

a) Construction phase

Direct impacts

Site 1 is located directly adjacent to Merrylands Station. During construction the use of equipment in close proximity to the building would have the potential to cause structural damage. The use of equipment during demolition, excavation and installation of any new facilities would have the potential to cause damage to the historic station building. Impacts would need to be managed carefully, in particular when equipment is working within 10 metres of the building.

Mitigation measures that would be implemented to manage construction vibration impacts on this heritage item are outlined in Table 33.

Archaeological relics

At Site 1, parts of the asphalt surface of the existing ground level car park would be removed and replaced. The new lift would involve ground works to allow for the construction of the lift shafts and pile foundations would be excavated across the site. The site has already been previously impacted with the construction of the car park and the drain running through the site. The archaeological potential is low at this site; therefore the proposed works are not anticipated to have an archaeological impact.

Site 2 would utilise part of the road reserve and an existing path area. The existing ground surface would be removed and levelled, with the new drainage system to be connected to existing pipes that run under the site. The archaeological potential is low at this site; therefore the proposed works are not anticipated to have an archaeological impact.

b) Operational phase

Direct impacts

The proposed works at Site 1 are partially located in the s170 curtilage for 'Merrylands Railway Station Building', although the design of the proposed works would not impact the building itself. The proposed works are outside of the main station complex, and the lift would be located adjacent to the current stairs to the car park near the entrance to the station. This part of the station complex is modern and not within the heritage curtilages.

The proposed design and operation of the Proposal does not present any direct risks to non-indigenous heritage.

Indirect impacts

There would be a direct visual connection between the Site 1 car park and the station building.

The most significant view of the station building is from the south-east at platform level, which would not be impacted by the construction of the Site 1 car park. The proposed works at Site 1 would elevate the ground level of the car parking to tie into the levels of the existing interchange so that visual impacts of this level would be negligible. The proposed split level 2A to be located to the east of the ground level would rise 1.7 metres above the ground level. The visual impacts of the mid ground level would be minor as the area of the proposed car parking would be located further away from the station building and behind existing fencing and platform canopies. The elevated section of the car park would not obstruct significant views onto the platform building nor detract from the character and setting of the station. Views of the station building from the footbridge are already impacted by the current platform canopy structures. The views to the north and north-east of the station building are not significant and have already been impacted by previous development including the existing bus interchange.

The Proposal includes the planting of 20 new trees between the station building and the new car park, providing a screen between the two items.

Because current views/vistas to and from the station are already intruded upon with existing development, the proposed works at Site 1 would result in a negligible to minor visual impact.

There is limited visual connection between Site 2 and the railway station. The proposed car park at Site 2 is an at grade car park that keeps to the existing style of car parking on Railway Terrace. The proposed works at Site 2 would result in a neutral visual impact to Merrylands Railway Station Building. Further detail on visual impacts is outlined in Section 6.2.

6.5.3 Mitigation measures

Potential impacts to non-Indigenous heritage during construction would be managed through the implementation of the CEMP prepared by the Contractor that would map the nearby non-Indigenous heritage item and prescribe management measures to ensure the item is not affected.

The CEMP would specify the following requirements:

- a heritage induction would be provided to workers prior to construction, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction
- in the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in TfNSW's Unexpected Heritage Finds Guideline (TfNSW, 2015a) would be followed, and works within the vicinity of the find would cease immediately. The 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. Potential vibration impacts would be managed in accordance with the measures outlined in Section 6.3.3.

Refer to Table 33 for a full list of proposed mitigation measures.

6.6 Socio-economic impacts

6.6.1 Existing environment

Site 1 is within Merrylands, a suburb within Cumberland Council LGA (formerly both the Holroyd and Parramatta LGAs). Site 2 is technically located within Granville, although it is 300 metres to the north of Site 1. Both sites are within the West Central Subregion (WCS) and are about 25 kilometres west of the Sydney CBD. According to *A Plan For Growing Sydney*, the West Central Subregional will be a significant focus for infrastructure investment and intensive growth over the next 20 years. A growing and prosperous Greater Parramatta will be supported by a network of centres providing jobs and services closer to home for many of the subregion's residents. This will improve liveability and contribute to strong, resilient communities throughout the subregion.

Site 1 of the Proposal is located within Merrylands commercial centre consisting of the amenities of former Holroyd LGA's largest city centre including government offices, residential, shopping centres, and a variety of commercial businesses. Site 2 is located to the north, on the east of the rail line in a residential area.

Hotels, day care facilities and religious facilities in Merrylands and in the vicinity of the Proposal include:

- The Living Word Worship Centre located at 1/2-6 Gladstone Street (200 metres north of Site 1 and 150 metres west of Site 2)
- Amana Family Day Care located at 2/252 Pitt St (directly across Terminal Place from Site 1)
- Alif Family Day Care located at A/1 Terminal PI (directly across Terminal Place from Site 1)
- Wise Family Day Care located at 1/130 Merrylands Rd (70 metres southwest of the Site 1)
- Evocca College Merrylands located at 224-240 Pitt St (35 metres north of Site 1)
- Billabong Hotel located at 153 Merrylands Rd (85 metres southwest from Site 1).

6.6.2 Potential impacts

a) Construction phase

The Proposal has the potential to impact commercial, residential and other uses within the vicinity of the works through:

- noise and vibration impacts
- temporary displacement of parking
- minor delays on the adjacent road network
- changes to traffic and pedestrian arrangements and transport e.g. buses.

Construction activities would predominantly be confined within each site and the adjoining roadway. Residents, businesses, Council and Sydney Trains would be notified of the works and where practicable consulted with regards to staging and timing, road closures and any required detours.

Construction would require the temporary closure of the existing car park at the railway station. This would result in the temporary displacement of commuter parking and Council timed parking spaces and have the potential to impact upon nearby businesses. Temporary lane closures on Terminal Place and Railway Terrace would potentially cause minor traffic delays.

Targeted consultation with adjacent day care facilities and the college would be undertaken throughout the duration of works. Signage would be provided with suitable notification to alert commuters and customers that access would be maintained to local commercial premises and trading would be as normal.

Access for emergency services would be maintained at all times and it is not anticipated that access to residential properties would be significantly affected during construction of the Proposal. No temporary acquisitions would be required for the construction stage of the Proposal. Any changes to property access would be temporary and as agreed with property owners.

b) Operational phase

The proposed parking arrangements at Site 1 and Site 2 would result in the gaining of approximately 85 new commuter parking spaces.

The longer term social and economic impacts of the Proposal would be positive for both residents and businesses of Merrylands, and particularly for commuters who frequent Merrylands Station. There would be an improvement in the accessibility of Merrylands Station for commuters as well as an improvement in safety and access. It is likely that such initiatives

would help to encourage more people to use public transport. As a result, it is expected that the Proposal would have a positive impact on nearby businesses.

No property acquisition would be required as a result of the Proposal.

6.6.3 Mitigation measures

Mitigation of potential socioeconomic impacts can be considered in line with mitigation of key aspects including traffic, transport, visual and noise. Refer to Sections 6.1, 6.2 and 6.3 for discussion of these potential impacts and associated mitigation measures. Table 33 identifies a number of environmental safeguards to minimise these potential impacts.

In addition, the following mitigation measures would be adopted:

- sustainability criteria for the Proposal would encourage the contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal
- a Community Liaison Plan would identify all potential stakeholders and the methods for consultation with these groups during construction and community notification requirements which can range from letter box drops, phone calls to offers of alternative accommodation depending on the level of impact.

The plan would also encourage feedback through the submissions process and facilitate opportunities for the community and stakeholders to have input into the Proposal, where possible.
- the community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed by the contractor prior to construction
- 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.

Refer to Table 33 for a full list of proposed mitigation measures.

6.7 Biodiversity

An ecological assessment was undertaken by Biosis in 2015. The assessment included desktop research along with site investigations.

A field investigation was undertaken to determine if any ecological constraints including threatened biota exists within the Proposal sites, and whether the area supports suitable habitat for threatened biota potentially occurring in the vicinity. Vegetation within the study area was rapidly surveyed using the random meander technique over two person hours.

6.7.1 Existing environment

Vegetation

Background research determined that vegetation within the study area had not previously been mapped (OEH, 2013). However, vegetation within the broader area has been previously mapped as Urban Exotic/Native (OEH 2013).

Vegetation within Site 1 included planted Lilly Pilly (*Acmena smithii*), Honey Myrtle (*Melaleuca linariifolia*) and a range of weeds including *Plantago lanceolate*, Red Natal Grass (*Melinis repens*), Castor Oil (*Ricinus communis*), Broad-leaved Privet (*Ligustrum lucidum*) and St John's Wort (*Hypericum perforatum*).

Vegetation in the vicinity of Site 2 along Railway Terrace and to the north east and also south west of the Neil Street overpass is comprised of planted native trees such as Lemon-scented Gum (*Corymbia citriodora*) and exotic species including Cocos Palms (*Syagrus romanzoffiana*) over a predominantly exotic understorey of grasses and weeds including Paspalum (*Paspalum dilatatum*), Bidens (*Bidens pilosa*), Pidgeon Grass (*Setaria parviflora*) and Purple Top (*Verbena bonariensis*).

Threatened flora species and communities

The results of the database searches identified the following threatened biota was previously recorded or predicted to occur in the locality of the Proposal (up to one kilometre radius):

- 8 threatened flora species listed under the TSC Act/EPBC Act
- 14 threatened fauna species and two endangered populations listed under the TSC Act, FM Act and/or EPBC Act
- 13 migratory species listed under the EPBC Act
- 4 listed endangered ecological communities.

Threatened flora searches identified Spiked Rice-flower *Pimelia spicata* (Endangered, TSC Act and EPBC Act) as the closest recorded species within one kilometre from the study area. Based on the habitat preferences for the species and given the highly disturbed and urban nature of the study area it has been considered unlikely to occur within the Proposal area based on the lack of suitable habitat (Biosis, 2015). The species was not located during the field investigation. The site did not contain vegetation meeting the definition of an Endangered Ecological Community (EEC) listed under the TSC Act.

Noxious weeds

A total of six weeds listed as noxious within the former Holroyd and/or Parramatta LGAs (DPI, 2015) were recorded within the Proposal. The control class and legal requirements of these are outlined in Table 32.

Table 32 Noxious weeds recorded within the Proposal

Common name	Scientific name	Class	Legal requirement
Balloon Vine	<i>Cardiospermum grandiflorum</i>	4	The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread
Lantana	<i>Lantana camara</i>	4	The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread
Broad-leaved Privet	<i>Ligustrum lucidum</i>	4	The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread
Castor Oil Plant	<i>Ricinus communis</i>	4	The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread
Morning Glory	<i>Ipomoea indica</i>	4	The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed

Common name	Scientific name	Class	Legal requirement
St Johns Wort	Hypericum perforatum	4	The growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed

Threatened fauna and habitats

Background searches were conducted to investigate threatened biota listed under the EPBC Act and/or the TSC Act which have been recorded within a 5 kilometre radius of the study area (OEH 2015b). In particular, threatened fauna searches identified Green and Golden Bell Frog *Litoria aurea* (Vulnerable, EPBC Act and Endangered, TSC Act) records less than 400 metres from the study area (OEH 2015).

Directly north of Site 2 is a stormwater outlet within which standing water was noted in addition to the presence of macrophytes such as Narrow-leaved Cumbungi (*Typha orientalis*) and Slender Knotweed (*Persicaria decipiens*) and an array of litter. Although this disturbed water body does not provide high quality habitat, *Litoria aurea* is known to be tolerant of disturbance in urban environments and may use this area as a means of dispersal to other areas more suited to foraging and shelter.

6.7.2 Potential impacts

a) Construction phase

Depending on the final design and construction methodology, the Proposal could result in the removal of four trees at Site 1 including the Lilly Pilly and Honey Myrtle, both of which are 15-60cm DBH (see Figure 26). These trees have been planted for landscape purposes and therefore do not constitute a particular native vegetation community (Biosis, 2015).

Site 2 requires the removal of an area of turf. During construction of the new footpath at Site 2, works have the potential to impact the root zone of three trees within the rail corridor. These trees would also require trimming. Dependent on the final design and construction methodology for Site 2, the proposal could require removal of these trees which are identified as planted native and exotic species and having a DBH less than 15cm (Biosis, 2015).

Additionally there is potential for disturbance to the soil profile which could increase the flow of nutrients and sediments into the drainage channel directly north of Site 2. This would be mitigated through the use of adequate erosion and sedimentation controls during construction.

TfNSW has prepared a *Vegetation Offset Guide* (TfNSW, 2016d) to provide a framework for a consistent approach to offset impacts to vegetation on applicable TfNSW projects and allows for appropriate offsets to be applied for one tree or a group of trees that do not form part of a vegetation community, regardless of whether they are native or not. The following ratios for the provision of replacement trees would be applied:

- four planted trees for every tree with a DBH of 15cm-60cm
- two trees for every tree with a DBH less than 15cm.

A minimum of 16 trees would need to be planted to compensate for the removal of up to four trees.

Should trees within the rail corridor adjacent to Site 2 require removal, a minimum of six trees would need to be planted to compensate for the removal of up to three trees.

The *Vegetation Offset Guide* would be applied to the Proposal during detailed development of the landscape plan to identify any potential to offset within the bounds of the Site. Additional offset vegetation planting would be planted at an alternative site in consultation with Council.

The Proposal is unlikely to significantly impact any threatened species, populations, ecological communities or their habitats.

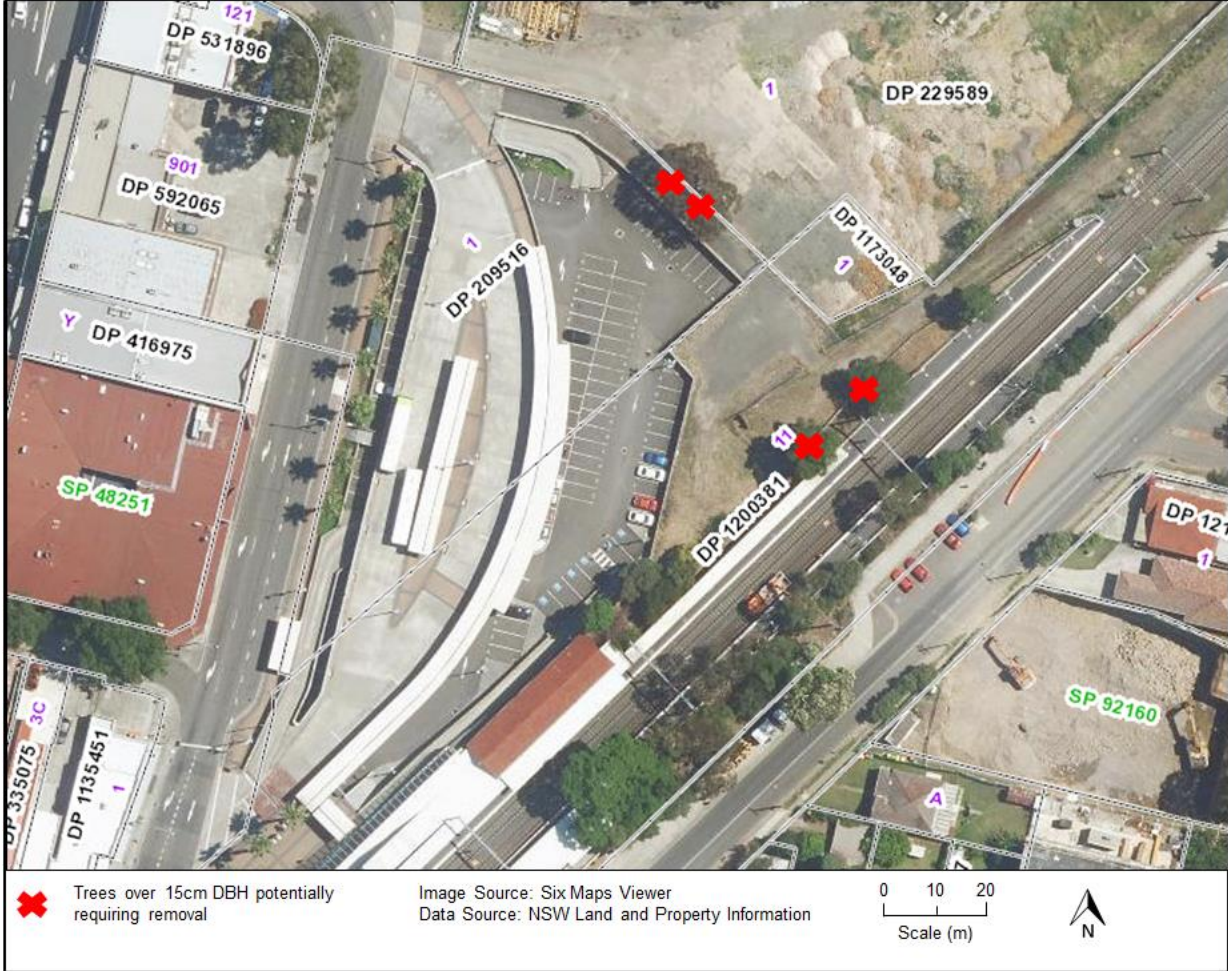


Figure 26 Trees that potentially require removal for the Proposal

b) Operational phase

Neither threatened flora or ecological communities, nor suitable habitat for such biota was found to be present within the Proposal area.

Operational activities at Site 1 adjacent to Merrylands Station and at Site 2 along Railway Terrace are not proposed to significantly change, and as a result there would be no increased risk to biodiversity.

6.7.3 Mitigation measures

The following mitigation measures are proposed to manage impacts to biodiversity:

- should detailed design identify those trees within the rail corridor adjacent to Site 2 require removal, approval would be sought from TfNSW based on the potential for Green and Golden Bell Frog to move through the area via the stormwater outlet in the north eastern section of the Site 2, works within the stormwater outlet should be avoided.

For new landscaping works, mulching and watering would be undertaken until plants are established.

- weed control measures, consistent with TfNSW's *Weed Management and Disposal Guideline* (TfNSW, 2015f), 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 *Noxious Weeds Act*.
- erosion and sediment controls should be implemented around the works area and any associated stockpiles to avoid impacts to waterways via stormwater runoff
- offsets and/or landscaping would be undertaken in accordance with TfNSW's *Vegetation Offset Guide* (TfNSW, 2013d) and in consultation with the relevant Council, and/or the owner of the land upon which the vegetation is to be planted. Any additional tree clearing required beyond that assessed in this REF would also require additional assessment, TfNSW approval, and tree offset planting.

Refer to Table 33 for a full list of proposed mitigation measures.

6.8 Contamination, landform, geology and soils

A desktop geotechnical study, supplemented by a site walkover survey, was carried out by Arup Pty Ltd in March 2015. Further ground investigation and laboratory testing was recommended to confirm ground conditions and determine parameters for foundation design.

Contamination and geotechnical investigations were undertaken by Douglas Partners in February 2016 (DP, 2016) to assess soil and groundwater conditions, locate and map existing services, and test for contamination.

The results of the reports are discussed below.

6.8.1 Existing environment

Soils and geology

The Penrith 1:100,000 Geological Series Sheet (Chapman & Murphy, 1989) indicates that Site 1 is at the boundary between the Bringelly Shale and the underlying Minchinbury Sandstone, both of the Wianamatta Group. The Bringelly Shale generally comprises shale, carbonaceous claystone, claystone, laminite, fine to medium-grained lithic sandstone, rare coal and tuff. The Minchinbury Sandstone comprises fine to medium-grained quartz-lithic sandstone. The corresponding 1:100,000 Penrith Soil Landscape Sheet indicates that bedrock at the site is overlain by residual soils of the Blacktown soil association, typically comprising moderately reactive, high plasticity, red and brown clays.

Site 2 is underlain by Ashfield Shale, part of the Wianamatta Group, comprised of dark-grey to black to dark grey shale and laminite. It should be noted that the Ashfield Shale underlies the Minchinbury Sandstone. The corresponding 1:100,000 Penrith Soil Landscape Sheet indicates that bedrock at the site is overlain by residual soils of the Blacktown soil association, typically comprising moderately reactive, high plasticity, red and brown clays.

Soil salinity

A review of the Holroyd LEP shows the Proposal area mapped as having moderate salinity potential.

Acid sulfate soils

A review of the Holroyd LEP and the Parramatta LEP show the Proposal area mapped as Class 5 acid sulfate soil risk. Within the LEPs, Class 5 is defined as land where works are at

risk of impacting acid sulfate soils if the works are: within 500 metres of adjacent Class 1, 2, 3 or 4 land; below 5 metres Australian Height Datum; and the water table is likely to be lowered below 1 metre Australian Height Datum on adjacent Class 1, 2, 3 or 4 land.

Generally speaking, on Class 5 land there is no potential for potential acid sulfate soils (PASS) to be present below the natural ground surface, though works must be managed to ensure that works do not impact Potential Acid Sulfate Soils (PASS) in surrounding areas, for example due to any works that lower the water table.

The geotechnical report indicates the site is underlain by Wianamatta Group shales and residual soils, which do not comprise PASS.

Laboratory results

The results of electrical conductivity, pH, chloride and sulfate ion analyses of both sites indicate that the concentrations within the soils analysed are non-aggressive to both concrete piles and to steel piles.

Groundwater

At Site 1, free groundwater levels were measured at three borehole locations, one borehole during the initial field work (0.8 metres deep) and two boreholes after development of the standpipe wells (2.4-2.7 metres deep).

Free groundwater was not encountered within the depth of investigation during field investigations at Site 2, but temporary 'perched' groundwater would likely be encountered at the base of fill during periods of wet weather. Free groundwater is not expected, however, within the minor depth of excavation anticipated for the pavement construction. It should be noted that groundwater levels can vary over time as a result of rainfall events and seasonal factors.

A search of the *Groundwater Dependent Ecosystems Atlas* on the Australian Bureau of Meteorology website on 30 March 2016 did not indicate that any Groundwater Dependent Ecosystems have been mapped within the vicinity of the site.

Contamination

A review of the NSW EPA contaminated land registers and the PoEO Act public register suggests the Proposal site is not listed as a contaminated site, nor has the site been subject to regulation under the *Contaminated Land Management Act 1997*.

The Geotechnical investigation and desktop contamination review on Site 1 did not identify any obvious soil contamination issues or potential soil contamination sources. Borehole investigations at Site 1 did not encounter any odours or obvious fragments of potential asbestos containing materials (ACM).

At Site 2, slag was identified in the on-site fill material and could be a source of contamination. Although no potential asbestos containing materials (ACM) were observed, brick fragments were encountered in the fill at BH102. ACM can sometimes be associated within building rubble (such as brick fragments).I. Naphthalene was detected in the fill sample from Test Bore BH102, depth 0.1 metre, at a low concentration.

Based on the laboratory results from both sites, it is considered that the concentrations of contaminants in soil at the borehole locations do not pose a potential risk to human health for the proposed development. The concentrations of petroleum hydrocarbons do not pose a potential risk in relation to the formation of observable light non-aqueous phase liquids, fire and explosion hazards, and impacts on buried infrastructure (DP, 2016).

Based on the observations at the time of sampling and the reported analytical results, the sampled filling at both sites as described in the geotechnical report has a preliminarily

classification as General Solid Waste (non-putrescible), as defined in the NSW EPA Waste Regulation 2014.

6.8.2 Potential impacts

a) Construction phase

The Proposal would require excavation work for foundations and footings and a new retaining wall. Other trenching, excavation or grading would be required for installing services, drainage works, new paving, and tree removal.

Soil disturbance

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

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

These impacts are considered to be low at Site 1 due to the flat site terrain and moderate at Site 2 due to the proximity to the culvert. However, it is expected that erosion risks could be adequately managed through the implementation of standard measures as outlined in the 'Blue Book' - *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004).

Salinity

Laboratory results from the geotechnical assessment do not indicate high levels of chloride (an indicator of salinity). The works involve relatively minor levels of excavation and are not anticipated to alter groundwater drainage patterns. The works are not expected to worsen salinisation in the local area.

Acid sulfate soils

The Proposal involves excavation but would not directly impact on PASS, which do not occur at the Site. The works are not expected to cause the water table to be lowered in adjacent areas containing PASS (i.e. Class 1, 2, 3 or 4 lands), as minimal impact on groundwater levels is anticipated. There would be no long term dewatering as a result of the works. The proposed works would not impact on ASS.

Contamination

Given the proximity to the rail corridor, excavation has the potential to expose contaminants, which if not appropriately managed, can present a health risk to construction workers and the community. Contaminants would also pose an environmental risk if they were to enter nearby waterways through the stormwater infrastructure. As there is potential for onsite contamination, chemical testing and visual characterisation would be undertaken to confirm the composition and nature of excavated material. Where spoil is classified as unsuitable for reuse it would be transferred to an appropriately licensed offsite facility.

There is also potential for activities to result in the contamination of soil through accidental fuel or chemical spills from construction plant and equipment.

b) Operational phase

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

6.8.3 Mitigation measures

The following mitigation measures would be implemented:

- prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction
- an environmental risk assessment would be undertaken prior to construction and must include a section on contamination as per the TfNSW's Environmental Risk Assessment Procedure (3TP-PR-206/3.0)
- 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
- a Waste Management Plan would be developed as part of the CEMP and would at a minimum:
 - identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities
 - detail other onsite management practices such as keeping areas free of rubbish
 - specify controls and containment procedures for hazardous waste and asbestos waste
 - outline the reporting regime for collating construction waste data
 - all waste would be managed in accordance with relevant legislation
- any surface water or groundwater dewatering would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and TfNSW's *Water Discharge and Reuse Guideline* (TfNSW, 2015b).

Refer to the Table 33 for a full list of proposed mitigation measures.

6.9 Hydrology and water quality

6.9.1 Existing environment

Surface water

The nearest watercourse is A'Becketts Creek, which begins about 225 metres to the north of the railway station on the northwest side of the rail line. A'Becketts Creek drains to Duck Creek and eventually into the Parramatta River.

Surface runoff within the vicinity of the Proposal is managed by the trunk drainage systems owned by Cumberland Council. The stormwater drainage system in the vicinity of the Proposal consists mainly of at-grade stormwater pits, connected to an underground pipe network. There is also a culvert discharging into an open drain that runs parallel to Railway Terrace directly north of Site 2. Presumably this drain flows under the rail line and into A'Becketts Creek.

Flooding

Flood mapping developed in 2013 by the former Holroyd City Council and available on the Cumberland Council website includes:

- Flood Control Lots Map (Figure 27)
- 1% Flood Extents Map (Figure 28)
- 1% Flood Hydraulic Categories Map (Figure 29)
- Provisional Flood Hazard Categories (Figure 30)
- Flood Risk Precincts Map (Figure 31).

Some flood mapping was updated in 2015, but is not yet available online to the general public. The former Holroyd City Council engineering department confirmed that both sites are located within the 1% AEP extent. Updated flood hydraulic categories mapping had not yet been determined for the 1% AEP flood event for the Proposal site at the time of this assessment.

The site surrounds (Terminal Place and the property along the northern boundary of the site) are classified as “floodway”. According to the *Floodplain Development Manual* (NSW, 2005), floodway areas convey a significant portion of flow and even if only partially blocked, would cause a significant redistribution of flood flow, or a significant increase in flood levels.

The Concept Design Report (ARUP, 2015) noted that the Site 1 entrances have ramps that prevent potential inundation of the site from Terminal Place (assumed to be set at this level as part of a previous planning condition in relation to flood). The report noted, however, that the existing car park may currently become inundated from a surcharge of the main stormwater culvert that the site drains to, which is a 5.79m x 1.83m box culvert. It was not determined by survey whether there is an existing non-return valve or other flood prevention measure on the existing stormwater system.

The potential for the existing and future car park to be inundated would be determined during detailed design. A flood advice letter may be obtained from Council that provides an estimate of the flood level for various storm events, based on recent flood studies.

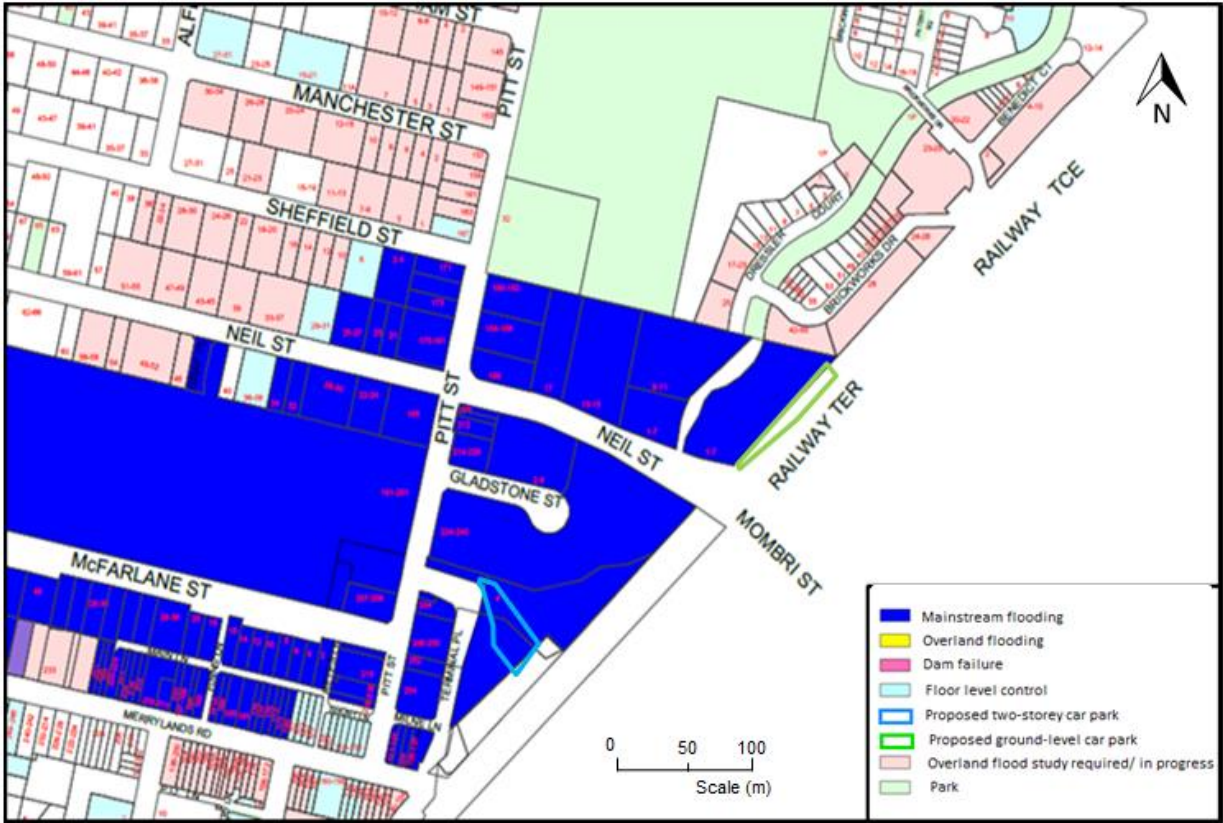


Figure 27 Flood control lot map (source: Holroyd City Council 2013)

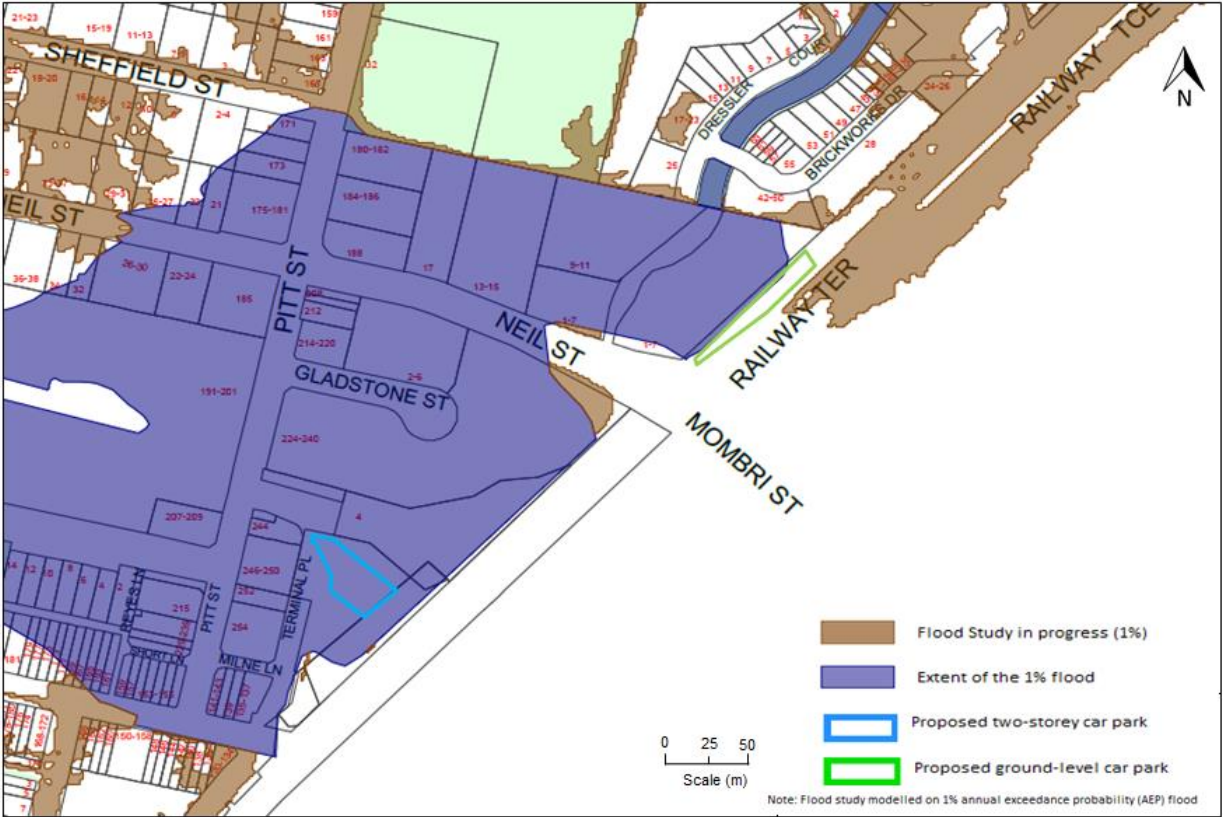


Figure 28 Extent of 1% AEP flood (Source: Holroyd City Council 2013)

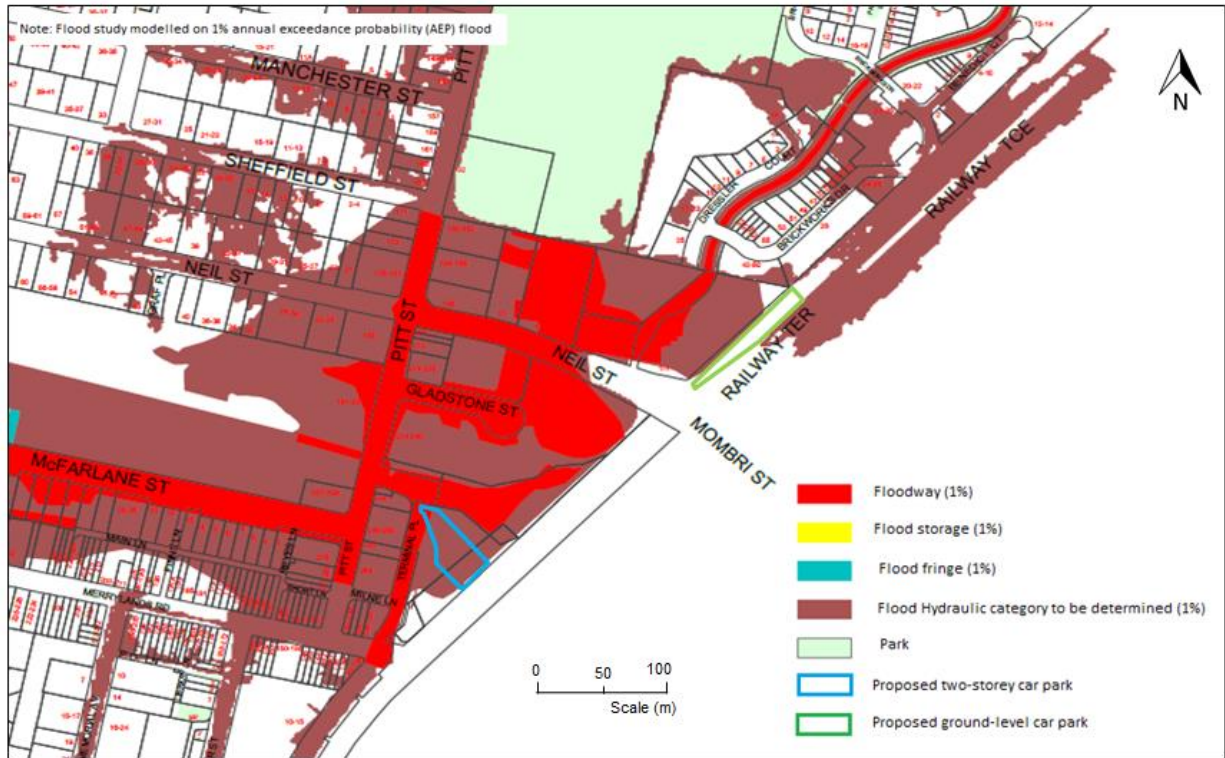


Figure 29 Flood hydraulic categories (source: Holroyd City Council 2013)

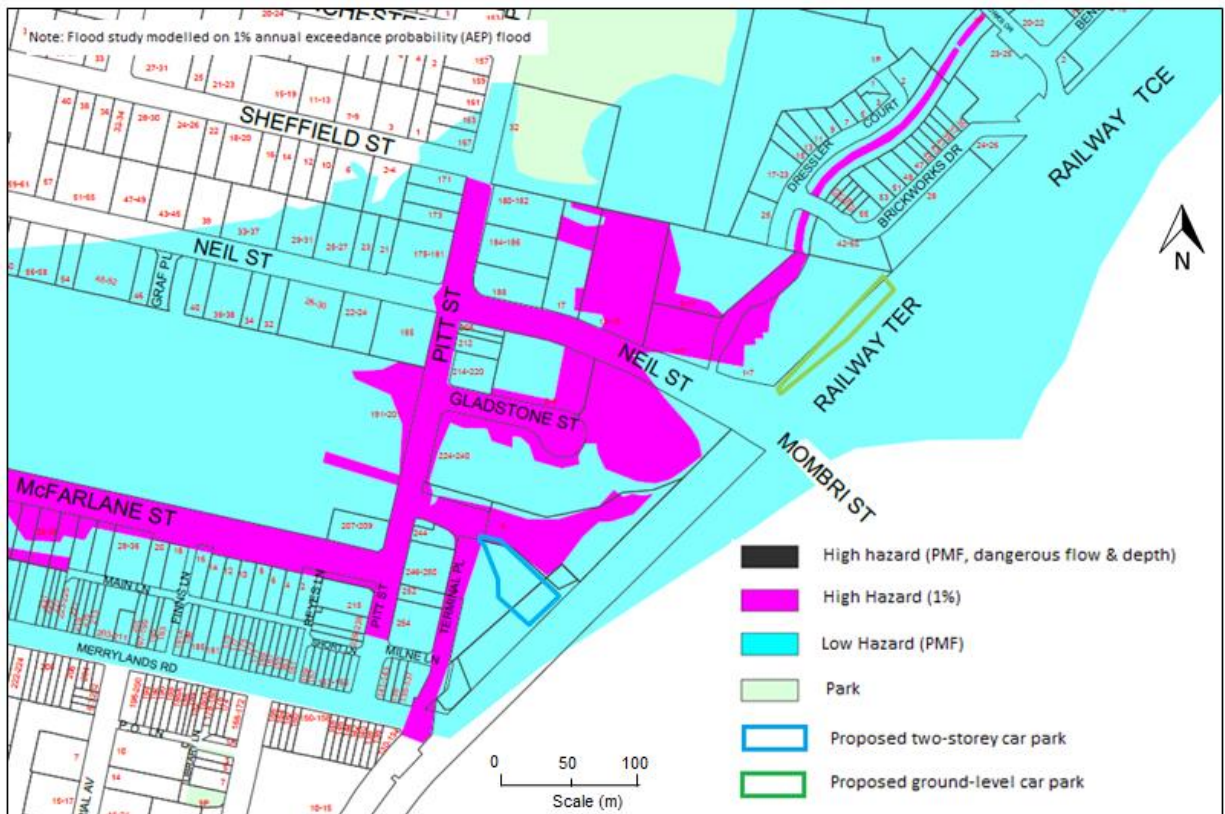


Figure 30 Provisional flood hazard categories (source: Holroyd City Council 2013)

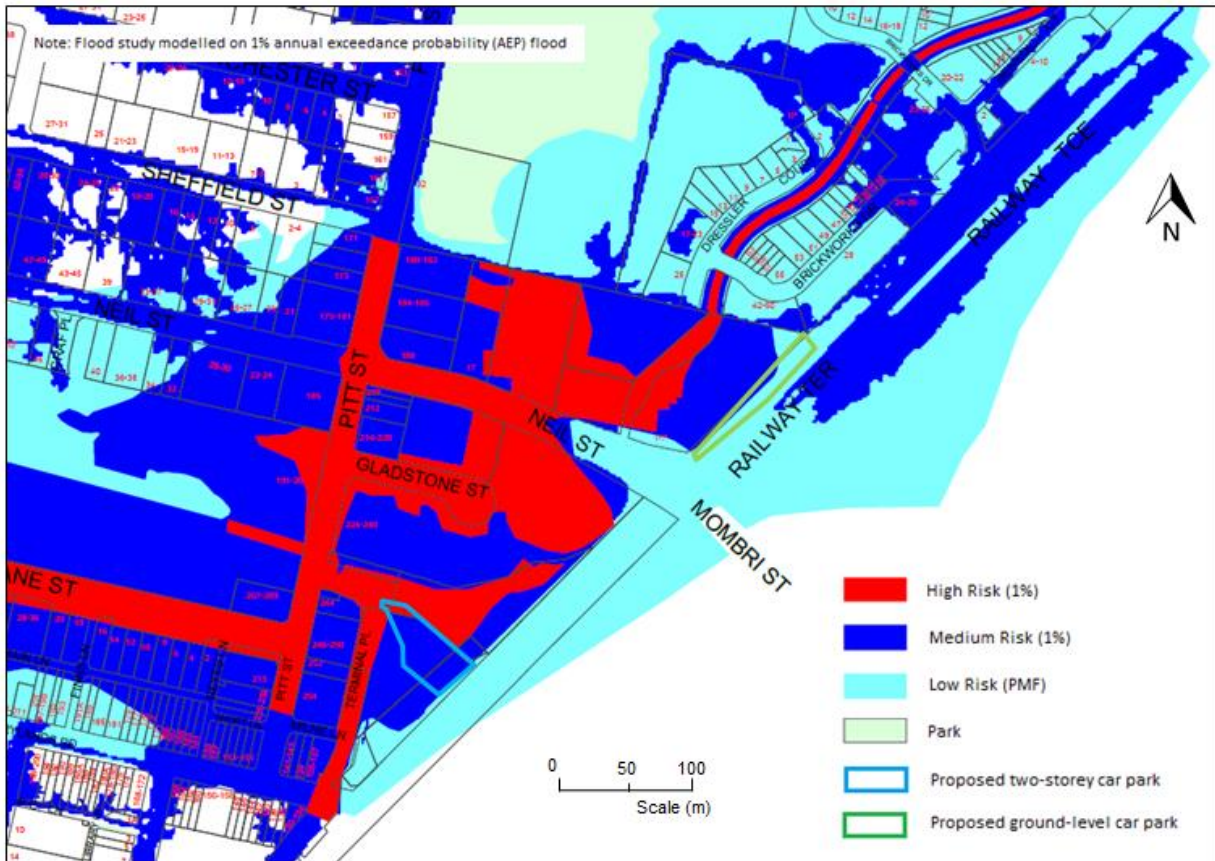


Figure 31 Flood risk precincts (source: Holroyd City Council 2013)

6.9.2 Potential impacts

a) 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 A'Becketts Creek. A range of mitigation measures to reduce the incidence of water quality impacts are proposed below and in Section 7.

Activities which would disturb soil during construction work (such as tree removal, excavation for footings, and realignment of kerbing) have the potential to impact upon local water quality as a result of erosion and sedimentation. There is also potential to contaminate local water quality 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 localised flooding which could increase the potential for soil erosion and sedimentation impacts.

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

b) Operational phase

Site 1 would be unlikely to impact upon the hydrology of the surrounding area. However, this needs to be confirmed through further hydrological assessment. The detailed design would take stormwater management into consideration. The new design does not result in a significant increase in impervious areas as it covers essentially the existing car park surface area.

Site 2 would increase impervious surface area in the vicinity by around 650 square metres. Stormwater and drainage systems would be designed in accordance with the relevant Sydney Trains, Sydney Water and Council standards and requirements, and should ensure that the works do not adversely impact upon Council's drainage infrastructure.

Although the Proposal is unlikely to result in changes to drainage patterns, the Proposal is located within an area susceptible to flooding in the 1% AEP event and would be impacted by the 100 year ARI and larger events. The proposed infrastructure within the underpass, including the new lift, would be designed such that they are not impacted by, and are appropriately protected from, flooding. This consideration would also extend to impacts of flooding on landscaping.

Further hydrological assessment would be undertaken during detailed design to ensure that the Proposal would not be impacted by flooding and would not worsen local flooding patterns.

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
- Cumberland 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 this assessment to ensure safe access to the station is maintained
- prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' Managing Urban Stormwater: Soils and Construction Guidelines (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction
- should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and TfNSW's *Water Discharge and Reuse Guideline* (TfNSW, 2015b)
- adequate water quality and hazardous material procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the TfNSW *Chemical Storage and Spill Response Guidelines* (TfNSW, 2015g) 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.
- should dewatering of the excavation be required then a Groundwater Management Plan would also be required to identify discharge consents required and manage the storage, discharge and / or disposal of groundwater
- temporary scour protection and energy dissipation measures would be designed and implemented to protect receiving environments from erosion.

Refer to Table 33 for a full list of 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 considered to be characteristic of an urban environment, with particular industrial and transport emission influences.

OEH undertakes air quality monitoring across NSW. The site is located within the Sydney north-west monitoring region with air quality monitored at four fixed sites. Prospect is the closest monitoring site to the Proposal. A search of the daily regional air quality index for the Sydney East region for the month of August, 2014 showed that the region generally experienced 'Good' air quality values with some outlying values of 'Poor' and 'Hazardous'.

A search of the National Pollutant Inventory database (NPI) 2012/13 data within Merrylands (postcode 2145) indicate that there are three nearby facilities which have reported pollution, all located within the Girraween Industrial Precinct.

Other sources of localised air pollution within proximity of Merrylands Station precinct would be car/truck exhaust fumes and diesel locomotives.

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

- users of the adjacent commercial and recreational areas
- local residents
- pedestrians and commuters within the Merrylands Station Precinct.

6.10.2 Potential impacts

a) Construction phase

An increase in greenhouse gas emissions, primarily carbon dioxide, would be expected during construction of the Proposal. Much of this would be from embedded energy within materials, followed by plant/equipment use. The greatest opportunities for reducing greenhouse gas emissions associated with the Proposal are likely to be in material selection.

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 potential wind erosion of areas of exposed soil.

Anticipated sources of dust and dust generating activities include:

- loading and transfer of material from trucks
- stockpiling activities
- excavation and preparation of the columns and footings, the new retaining wall, tree removal and drainage works
- general construction works.

The total amount of dust generated would depend on the properties of the demolition and soil material (silt and moisture content), the activities undertaken and the prevailing meteorological conditions.

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 works.

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 receptors, given the relatively small construction footprint, and with the implementation of proposed control measures.

b) Operational phase

Modelling indicates that during the AM peak the proposed commuter car park is expected to generate an additional 64 arrivals between 7–8am. The proposed commuter car park is expected to generate an additional 32 departures during the PM peak hour (5.50–6.50pm). As such there would be a minor increase in the number of vehicles accessing the area around the Merrylands interchange.

Conversely, increased patronage of the rail system would likely reduce commuter vehicle movements on local roads and therefore reduce vehicle emissions in the long term, which would have some beneficial effects on local and regional air quality.

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. The provision of additional parking spaces will increase the number of vehicles operating within the immediate vicinity of the Proposal. In the context of the local environment and existing vehicle patterns and number, however, this change is expected to be minimal.

6.10.3 Mitigation measures

Table 33 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, 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 Other impacts

6.11.1 Waste

Construction of the Proposal would generate the following wastes:

- excavated soil, sediment and rock
- vegetation including weeds
- asphalt and concrete
- surplus building materials
- building wastes including metals, timbers, plastics, concrete, packaging, etc.
- general waste, including food, glass, plastic, paper and other wastes generated by construction workers.

The quantities and types of wastes expected to be generated, are not likely to pose any unusual or problematic waste management issues.

Mitigation measures

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

The application of the *NSW Sustainable Design Guidelines – Version 3.0* (TfNSW, 2013a) would also result in waste management targets to be developed for the Proposal and would include reuse and recycling.

Refer to Table 33 for a list of proposed mitigation measures.

6.12 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 and Environment's Major Projects Register, Sydney West Joint Regional Planning Panel Development and Planning Register, Parramatta City Council Development Application Register and the Holroyd City Council Development Application Register on 18 November 2016 identified a number of major developments within the vicinity of the Proposal site. These include:

- in July 2015, two residential developments were approved close to the site, including a 49 unit development approximately 400 metres away and a 23 unit development approximately 800 metres away from Site 1
- a 39 room boarding house approved for construction approximately 650 metres from Site 2
- in April 2016, a mixed use building development application was registered for Stockland's Merrylands approximately 300 metres away from Site 1
- in May 2016, a mixed use development was approved close to the site including a 355 unit development approximately 50m from Site 1
- the WestConnex M4 Widening Stage 1 is currently under construction with one section located approximately 700 metres north of Site 2

Various minor developments have been proposed within the two LGAs but these are not expected to have any cumulative impacts.

During construction, the works would be coordinated with any other construction activities in the area where required. Consultation and liaison would occur with Cumberland Council, Roads and Maritime Services, RailCorp/Sydney Trains, and any other developers identified, to minimise cumulative construction impacts such as traffic and noise.

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

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

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

6.13 Climate change and sustainability

6.13.1 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 an AS 14064-2 (Greenhouse Gases - project level) compliant carbon foot printing exercise in accordance with TfNSW's *Greenhouse Gas Inventory Guide for Construction Projects* (TfNSW, 2013e). 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 works, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Table 33.

It is anticipated that, once operational, the Proposal may result in an increase in use of public transport and a relative decrease in use of private motor vehicles by commuters to travel to and from Merrylands. 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 Sydney region.

6.13.2 Climate change

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

Within urban areas, localised warming can occur through the development over natural areas and establishment of other sources of heat including people, equipment and vehicles. Paved and dark coloured surfaces such as roads and buildings absorb and store solar heat energy. Impervious surfaces increase runoff and remove moisture that would otherwise be retained in the ground and contribute to cooling by evapotranspiration. Urban heat impacts can be minimised through the use of light coloured surfaces to increase reflectivity, increasing tree cover and minimising energy usage.

The Proposal provides improved access for commuters to public transport which in turn would minimise private vehicle usage, a significant contributor to anthropogenic heating. A small amount of vegetation would be removed to facilitate the Proposal, but this loss would be offset through vegetation planting in accordance with TfNSW's *Vegetation Offset Guide* (TfNSW, 2013d). A number of sustainability measures are also being considered during detailed design to maximise energy efficiency of the Proposal.

Climate change could lead to an increase in the intensity of rainfall events, whereby the rainfall expected to occur in a 100-year average recurrence interval flood event would occur more frequently. A detailed hydrological assessment would be undertaken to ensure that the proposed infrastructure would not worsen the existing flooding known to occur within the

Proposal area, and would reduce the potential impacts of climate change. For more information on flooding, refer to Section 6.9.

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

A Climate Change Assessment would be undertaken at detailed design to understand potential future climate impacts, asset vulnerabilities and typical control measures for adaptation. Climate change projections readily available for the Sydney metropolitan area would be used and considered as appropriate for the site.

Refer to Table 33 for a list of mitigation measures.

6.13.3 Sustainability

The design of the Proposal would be based on the principles of sustainability, including the incorporation of the *NSW Sustainable Design Guidelines – Version 3.0* (TfNSW, 2013a) and the TfNSW *Environmental Management System* (EMS). These guidelines require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.1.4 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.

7 Environmental management

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

7.1 Environmental management plans

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

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

7.2 Mitigation measures

Mitigation measures for the Proposal are listed below in Table 33. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

The table consists of standard mitigation measures identified by TfNSW and additional measures to manage project specific impacts as identified in this REF.

Table 33 Proposed mitigation measures

No.	Mitigation measure
General	
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of <i>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.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the Contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An Environmental Controls Map (ECM) would be developed by the Contractor in accordance with TfNSW's <i>Guide to Environmental Controls Map</i> (TfNSW, 2015c) for approval by TfNSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.

No.	Mitigation measure
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6.	Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on the ECM to avoid direct impacts during construction.
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7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by TfNSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.
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Traffic and site access	
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8.	Alternative parking options to offset the temporary loss of commuter parking during construction would be investigated and reported on during detailed design and construction planning, in consultation with the relevant authorities and the local community. Options for staging of Site 2 works prior to Site 1 must also be considered in order to assist in offsetting commuter parking lost during construction of Site 1. Appropriate alternative parking arrangements would be implemented during construction, where reasonable and feasible.
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9.	Assess the demand for temporary bike lockers during detailed design to accommodate the temporary loss of eight bicycle lockers on Terminal Place during construction. Provide temporary lockers as required
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10.	Consult with relevant authorities during detailed design to determine appropriate controls for impacts to the mail zone, bus zone and kiss and ride at Site 1
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11.	<p>Prior to the commencement of construction, a Traffic Management Plan (TMP) would be prepared as part of the CEMP and would include at a minimum:</p> <ul style="list-style-type: none">• ensuring adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road incidents and disruption to surrounding land uses is minimised• maximising safety and accessibility for pedestrians and cyclists• ensuring adequate sight lines to allow for safe entry and exit from the site• maintaining access to railway stations, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made)• managing impacts and changes to on and off street parking and requirements for any temporary replacement provision• parking locations for construction workers away from stations and busy residential areas and details of how this will be monitored for compliance• routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses• details for relocating kiss and ride, taxi ranks and rail replacement bus stops if required, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired• measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the TMP• procedures for preparing and implementing Traffic Control Plans (TCPs) particularly for detours and traffic control to manage temporary road disruptions on Railway Terrace and Terminal place• final construction traffic approach and departure routes, site compound(s) and loading zones• access routes to and from the local road network and contractor parking• scheduling of works/deliveries to avoid peak times and generally limiting works in the
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No.	Mitigation measure
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road carriageway as much as practicable.

- Consultation with the relevant roads authorities would be undertaken during preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction.

12.	A separate Traffic Control Plan will be prepared for the construction work off Railway Terrace and will address the pedestrian and cyclist movements that currently occur along the footpath across the site frontage to the new parking area.
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13.	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 works.
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14.	Construction traffic movements would be scheduled to avoid local traffic peaks.
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15.	Road Occupancy Licences for temporary road closures would be obtained, where required.
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16.	Access to all private properties and businesses adjacent to the works would be maintained during construction, unless otherwise agreed by relevant property owners.
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17.	Relevant authorisation(s) from the appropriate road authority would be obtained for the proposed operational changes, such as operational changes to the bus zone, parking, pathways, and signage etc., as necessary.
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Urban design, landscape and visual amenity

18.	An Urban Design Plan (UDP) would be prepared by the Contractor at the 30% design stage of detailed design, in consultation with Cumberland Council, and submitted to TfNSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design and would include as a minimum:
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- the appropriateness of the proposed design with respect to the existing surrounding landscape, built form, behaviours and use-patterns (including consideration of Crime Prevention Through Environmental Design principles). This is to include but not be limited to:
 - connectivity with surrounding local and regional movement networks including street networks, other transport modes and active transport networks. Existing and proposed paths of travel for pedestrians and bicycles should be shown
 - integration with surrounding local and regional open space and or landscape networks. Existing and proposed open space infrastructure/landscape elements should be shown
 - integration with surrounding streetscape including street wall height, active frontages, awnings, street trees, entries, vehicle cross overs etc.
 - integration with surrounding built form (existing or desired future) including building height, scale, bulk, massing and land-use
- design detail that is sensitive to the amenity and character of heritage items located within or adjacent to the Proposal site

No.	Mitigation measure
19.	<p>A Public Domain Plan (PDP) would be prepared by the contractor at the 30% design stage of detailed design, in consultation with Cumberland Council, and submitted to TfNSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The PDP, at a minimum, would address the following:</p> <ul style="list-style-type: none"> • materials, finishes, colour schemes and maintenance procedures including graffiti control for new walls, barriers and fences • location and design of pedestrian and bicycle pathways, street furniture including relocated bus and taxi facilities, bicycle storage (where relevant), telephones and lighting equipment • landscape treatments and street tree planting to integrate with surrounding streetscape • opportunities for public art created by local artists to be incorporated, where considered appropriate, into the Proposal • total water management principles to be integrated into the design where considered appropriate • design measures included to meet TfNSW' s <i>NSW Sustainable Design Guidelines - Version 3.0</i> (TfNSW, 2013a) • identification of design and landscaping aspects that will be open for stakeholder input, as required.
20.	<p>All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to AS 1158 Road Lighting and AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting.</p>
21.	<p>The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.</p>
22.	<p>Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations</p>
23.	<p>Temporary hoardings, barriers, traffic management and signage would be removed when no longer required</p>
24.	<p>Retaining and protecting existing trees where practicable including consultation with a qualified arborist to minimise impact on the long term health of any nearby trees that could be or are planned to be retained</p>
25.	<p>Rehabilitation of disturbed areas</p>
26.	<p>Installation of way-finding signage as per TfNSW guidelines</p>
27.	<p>Removal of temporary hoardings, barriers, traffic management and signage when no longer required</p>
28.	<p>Light spill from the construction area into adjacent visually sensitive properties would be minimised by:</p> <ul style="list-style-type: none"> • directing construction lighting into construction areas and ensuring the site is not over-lit • the sensitive placement and specification of lighting to minimise any potential increase in light pollution • design and installation of all lighting in accordance with the requirements of <i>AS4282 Control of the Obtrusive Effects of Outdoor Lighting</i>.

No.	Mitigation measure
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29. During construction, graffiti would be removed in accordance with TfNSW's Standard Requirements.

Hoardings, site sheds, fencing, acoustic walls around the perimeter of the site and any structures built as part of the Project are to be maintained free of graffiti and advertising not authorised by the Proponent during the construction period. Graffiti and unauthorised advertising will be removed or covered within the following timeframes:

- a) Offensive graffiti will be cleaned or covered within 24 hours
- b) Highly visible yet non-offensive graffiti will be cleaned or covered within 1 week
- c) Graffiti that is neither offensive nor highly visible will be cleaned or covered during normal operations within one month.

Any advertising material will be removed or covered within 24 hours.

Noise and vibration

30. Surveys of nearby sensitive buildings would be carried out in order to assess the potential for increased susceptibility to building damage from vibration. Should these buildings be considered more susceptible to vibration, reduced vibration criteria levels may be applicable and subsequently adopted during the selection process for suitable equipment to be used in the vicinity of these buildings.

31. Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Construction Noise Strategy* (TfNSW, 2012c) and the Noise and Vibration Impact Assessment for the Proposal (Wilkinson Murray, 2016). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable and implementing mitigation and management in accordance with the CNS.

32. The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include:

- regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise
- avoiding any unnecessary noise when carrying out manual operations and when operating plant
- ensuring spoil is placed and not dropped into awaiting trucks
- avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable
- switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded
- avoiding deliveries at night/evenings wherever practicable
- no idling of delivery trucks
- keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site
- minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios onsite; no dropping of materials from height where practicable, no throwing of metal items and slamming of doors.

No.	Mitigation measure
33.	<p>The CNVMP would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered, include:</p> <ul style="list-style-type: none"> • maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances • using the most suitable equipment necessary for the construction works at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc. • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours works • use of quieter and less vibration emitting construction methods where feasible and reasonable.
34.	<p>Works would generally be carried out during standard construction hours (i.e. 7am–6pm Monday to Friday; 8am–1pm Saturdays). Any works outside these hours may be undertaken if approved by TfNSW and the community is notified prior to these works commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the TfNSW Environment and Planning Manager for any works outside normal hours.</p>
35.	<p>A noise monitoring program would be carried out for the duration of the works in accordance the CNVMP prepared for the Proposal, and any approval and licence conditions.</p>
36.	<p>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 Strategy</i> (TfNSW, 2012c). This would include restricting the hours that very noisy activities can occur.</p>
37.	<p>To avoid structural impacts as a result of vibration or direct contact with structures, the proposed works would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (Wilkinson Murray, 2016) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.</p>
38.	<p>Vibration resulting from construction and received at any structure outside of the project would be managed in accordance with:</p> <ul style="list-style-type: none"> • for structural damage vibration - German Standard DIN 4150: Part 3 – 1999 <i>Structural Vibration in Buildings: Effects on Structures</i> and British Standard BS 7385-2:1993 <i>Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)</i> • for human exposure to vibration the acceptable vibration - values set out in the <i>Environmental Noise Management Assessing Vibration: A Technical Guideline</i> (Department of Environment and Conservation, 2006) which includes British Standard BS 7385-2:1993 <i>Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz)</i>.
39.	<p>Vibration monitoring would be undertaken at receiver R3 for work using a hydraulic hammer or vibratory roller to ensure limits for human comfort are not exceeded.</p>

No.	Mitigation measure
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| 40. | 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 50 metres from the works and all heritage listed buildings and other sensitive structures within 150 metres of the works (unless otherwise determined following additional assessment they are not likely to be adversely affected). |
| 41. | Affected pre-schools, schools, universities and other identified sensitive receivers would be consulted in relation to noise mitigation measures to identify any noise sensitive periods, e.g. exam periods. Noise intensive construction works in the vicinity of affected educational buildings are to be minimised as much as reasonably possible. |
| 42. | To effectively mitigate potential impacts of vibration on the Merrylands Railway Station heritage building, activities that cause vibration would be managed in accordance with German Standard DIN 4150 – Part 3 (DIN 1999) heritage specifications. Real time vibration monitoring would be conducted at commencement of relevant works to confirm compliance with the German Standard DIN 4150. If vibration levels approach the determined trigger level, then the construction activity would cease and the heritage structure would be assessed and alternative construction methodologies developed, where practicable, before construction recommences. |
| 43. | During construction, suitable measures would be put in place to ensure the retained heritage elements are protected from damage. Measures may include hoardings, use of spotters during the movement of equipment and other measures as necessary. |
| 44. | An Operational Noise and Vibration Impact Assessment (ONVIA) would be undertaken during the detailed design phase to confirm predictions of operational noise levels based on detailed design. <ul style="list-style-type: none">○ The ONVIA would also assess potential noise impacts of the operation of mechanical equipment required for the Proposal (i.e. mechanical ventilation and stormwater pumps).○ further analysis would be undertaken at a detailed design stage to identify the noise contribution from cars accelerating on access ramps as this is highly dependent on the detailed design |
| 45. | Operation of the car park would be undertaken in a manner that achieves sleep disturbance criteria as per guidance in the INP and RNP and comply with the amenity or intrusiveness criteria (whichever is assessed as more stringent) as per the INP. |
| 46. | Following commencement of operation, noise monitoring will be undertaken to verify the predicted operational noise levels. Operational monitoring shall be determined by an independent acoustic engineer accredited by the Association of Australian Acoustic Consultants (AAAC) or environmental specialists acceptable to TfNSW. All reasonable and feasible additional noise mitigation or management measures that are necessary to reduce noise levels or minimise impacts would be undertaken. |

Indigenous heritage

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| 47. | 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 Indigenous cultural heritage material and places to the Indigenous community and non-Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites. |
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No.	Mitigation measure
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48.	If unforeseen Indigenous objects are uncovered during construction, the procedures contained in TfNSW's <i>Unexpected Heritage Finds Guideline</i> (TfNSW, 2015a) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and TfNSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, 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.
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Non-Indigenous heritage	
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49.	A heritage induction would be provided to workers prior to construction, informing them of the location of known heritage items and guidelines to follow if unanticipated heritage items or deposits are located during construction.
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50.	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, 2015a) would be followed, and works within the vicinity of the find would cease immediately. The 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.
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51.	As Merrylands Station is listed as a heritage item on RailCorp's s170 Heritage and Conservation Register and on the Holroyd LEP, Sydney Trains Heritage and Cumberland Council would be notified of the proposed works.
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52.	Undertake a structural assessment of the Merrylands Railway Station Building prior to works to determine if indirect impacts, for instance as a result of vibrations, are likely to occur. Modify works to avoid indirect impacts if required.
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53.	Should amendments to the design of the proposed work be made, the heritage report (Artefact, 2016) would be updated to assess the potential heritage impact of the proposed works, as amended.
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54.	Implement measures to prevent inadvertent impacts to listed heritage items during construction: <ul style="list-style-type: none">• An exclusion zone should be established around Merrylands Railway Station Building. This should be visibly demarked by physical barriers and appropriate procedures for working nearby should be identified in the Construction Environmental Management Plan• machinery to be kept at a distance from Merrylands Railway Station Building
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55.	Provide copies of the Statement of Heritage Impact Report to TfNSW, local libraries in both Holroyd and Parramatta, and the library of the Heritage Division of the Office of Environment and heritage
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Socio-economic	
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56.	Sustainability criteria for the Proposal would be established to encourage the Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.
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No.	Mitigation measure
57.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
58.	<p>A Community Liaison Plan would identify all potential stakeholders and the methods for consultation with these groups during construction and community notification requirements which can range from letter box drops, phone calls to offers of alternative accommodation depending on the level of impact.</p> <p>The plan would also encourage feedback through the submissions process and facilitate opportunities for the community and stakeholders to have input into the project, where possible.</p>
59.	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.
60.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed by the contractor prior to construction.
Biodiversity	
61.	<p>Should detailed design identify those trees within the rail corridor adjacent Site 2 require removal approval would be sought from TfNSW based on the potential for Green and Golden Bell Frog to move through the area via the stormwater outlet in the north eastern section of the Site 2, works within the stormwater outlet should be avoided.</p> <p>For new landscaping works, mulching and watering would be undertaken until plants are established.</p>
62.	Construction of the Proposal must be undertaken in accordance with TfNSW' s <i>Vegetation Management (Protection and Removal) Guideline</i> (TfNSW, 2015d) and TfNSW' s <i>Fauna Management Guideline</i> (TfNSW, 2015e).
63.	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.
64.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the Ecological Assessment (Biosis, 2015) would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through temporary protection measures discussed below.
65.	Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Ecological Assessment (Biosis, 2015). 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.
66.	In the event of any tree to be retained becoming damaged during construction, the 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.
67.	Should the detailed design or onsite works determine the need to remove or trim any additional trees (including trees within the rail corridor adjacent to Site 2), which have not been identified in the REF, the Contractor would be required to complete TfNSW' s Tree Removal Application Form and submit it to TfNSW for approval.

No.	Mitigation measure
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| 68. | Weed control measures, consistent with TfNSW's <i>Weed Management and Disposal Guideline</i> (TfNSW, 2015f), 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>Noxious Weeds Act 1993</i> . |
| 69. | For new landscaping works, mulching and watering would be undertaken until plants are established and for a period of no less than 12 months. |
| 70. | Based on the potential for Green and Golden Bell Frog to move through the area via the stormwater outlet in the north eastern section of the Site 2, works within the stormwater outlet should be avoided |
| 71. | Offsets and/or landscaping would be undertaken in accordance with TfNSW's <i>Vegetation Offset Guide</i> (TfNSW, 2013d) and in consultation with the relevant Council, and/or the owner of the land upon which the vegetation is to be planted. Any additional tree clearing required beyond that assessed in this REF would also require additional assessment, TfNSW approval, and tree offset planting. |
| 72. | Weed control measures, consistent with TfNSW's <i>Weed Management and Disposal Guideline</i> (TfNSW, 2015f), 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>Noxious Weeds Act 1993</i> . |

Soils and water

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| 73. | Cumberland Council would be consulted in relation to detailed drainage design. |
| 74. | Prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' <i>Managing Urban Stormwater: Soils and Construction Guidelines</i> (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction. |
| 75. | An environmental risk assessment would be undertaken prior to construction and must include a section on contamination as per the TfNSW's Environmental Risk Assessment Procedure (3TP-PR-206/3.0) |
| 76. | 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 |
| 77. | Erosion and sediment controls should be implemented around the works area and any associated stockpiles to avoid impacts to waterways via stormwater runoff. |
| 78. | Temporary scour protection and energy dissipation measures would be designed and implemented to protect receiving environments from erosion. |
| 79. | Erosion and sediment control measures would be established prior to any clearing, grubbing and site establishment activities and would be maintained and regularly inspected (particularly following rainfall events) to ensure their ongoing functionality. Erosion and sediment control measures would be maintained and left in place until the works are complete and areas are stabilised. |

No.	Mitigation measure
80.	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.
81.	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, 2015g).
82.	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, 2015g) 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.
83.	In the event of a pollution incident, works would cease in the immediate vicinity and the 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.
84.	The existing drainage systems would remain operational throughout the construction phase.
85.	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, 2015b).
86.	Should dewatering of the excavation be required then a Groundwater Management Plan will also be required to identify discharge consents required and manage the storage, discharge and / or disposal of groundwater.
87.	Any surface water or groundwater dewatering 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, 2015b).
88.	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
89.	<p>The following flood mitigation measures are to be considered during detailed design:</p> <ul style="list-style-type: none"> • further hydrological assessment would be undertaken to ensure that the Proposal would not be impacted by flooding and would not worsen local flooding patterns • adequate measures are to be provided to reduce flood risks. The potential impacts of climate change on flooding shall be considered as part of this assessment to ensure safe access to the station is maintained • flood mitigation measures and a maintenance strategy would be developed for the lift • if any flood mitigation is proposed, flood modelling would be undertaken to confirm that the Proposal and any flood mitigation would achieve a neutral flood impact on upstream and downstream properties • adequate measures are to be adopted to ensure impacts from flooding on landscaping design are factored into the PDP.
Air quality	
90.	Air quality management and monitoring for the Proposal would be undertaken in accordance with TfNSW' s <i>Air Quality Management Guideline</i> (TfNSW, 2015h).

No.	Mitigation measure
91.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
92.	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.
93.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
94.	<p>To minimise the generation of dust from construction activities, the following measures would be implemented:</p> <ul style="list-style-type: none"> • cover stockpiles when not in use • apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) • appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading • prevent mud and dirt being tracked onto sealed road surfaces.
Waste and contamination	
95.	Waste management would be undertaken in accordance with the <i>Waste Avoidance and Resource Recovery Act 2001</i> (WARR Act). A Waste Management Plan would be prepared that would 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 along with other onsite management practices such as keeping areas free of rubbish.
96.	<p>The CEMP will include a Waste Management Plan that must address waste management and would at a minimum:</p> <ul style="list-style-type: none"> • identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data. <p>All waste would be managed in accordance with relevant legislation.</p>
97.	An environmental risk assessment would be undertaken prior to construction and must include a section on contamination as per the TfNSW's Environmental Risk Assessment Procedure (3TP-PR-206/3.0)
98.	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.
99.	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.
100.	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.

No.	Mitigation measure
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| 101. | Any concrete washout would be established and maintained in accordance with TfNSW's <i>Concrete Washout Guideline – draft</i> (TfNSW, 2015i) with details included in the CEMP and location marked on the ECM. |
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Climate change and sustainability	
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| 102. | Detailed design of the Proposal would be undertaken in accordance with the <i>NSW Sustainable Design Guidelines – Version 3.0</i> (TfNSW, 2013a) with a view to obtaining a Silver rating or better. |
| 103. | The detailed design process would involve the development of a climate change impact assessment in compliance with the <i>Climate Change Impacts and Risk Management: A Guide for Business and Government</i> (Department of the Environment and Heritage, 2006) and the <i>ISCA Guidelines for Climate Change Adaptation</i> (AGIC, 2011) to determine the hazards/risks associated with future climatic conditions. Issues including protecting customers and electrical equipment from wind and rain during storm events, size of guttering, cross flow ventilation, reflective surfaces etc. would be considered in the design. |
| 104. | The detailed design process would include a Greenhouse Gases (project level) compliant carbon foot printing exercise in accordance with AS14064-2 and TfNSW's <i>Greenhouse Gas Inventory Guide for Construction Projects</i> (TfNSW, 2013e). The carbon footprint would then be used to inform decision making in design and construction. |

Cumulative impacts	
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| 105. | The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed in the CEMP, and implemented as appropriate. |
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8 Conclusion

This REF has been prepared in accordance with the provisions of section 111 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:

- provision of approximately 65 new commuter parking spaces (approximately 220 in total) including six accessible car parking spaces at Site 1, and 20 new commuter parking spaces (24 in total) at Site 2
- improved accessibility for customers at Merrylands Station providing an accessible route to the station platforms through the provision of a lift from the lower ground level of the car park (Level 1) to the station forecourt
- potential increased use of public transport to and from Merrylands.

The likely key impacts of the Proposal are as follows:

- temporary loss of parking during construction
- temporary noise and vibration impacts during construction
- temporary dust and visual impacts
- minor delays on the adjacent road network during construction
- temporary changes to access arrangements (including pedestrian diversions) during construction
- removal of planted vegetation on the site
- introduction of new elements into the visual landscape – new lift shaft and parking deck, and new at-grade parking spaces
- a slight increase in local traffic movements.

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). 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 to be 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.

Based on the assessment contained in this REF, and proposed mitigation measures outlined 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.

The Proposal would also take into account the principles of ESD (refer to Section 3.1.4 and Section 4.5). These would be considered during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

References

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TfNSW, 2013c, *Sydney's Cycling Future - Cycling for everyday transport*, Sydney

TfNSW, 2013d, *Vegetation Offset Guide*, Sydney

TfNSW, 2013e, *Greenhouse Gas Inventory Guide for Construction Projects*, Sydney

TfNSW, 2015a, *Unexpected Heritage Finds Guideline*, Sydney

TfNSW, 2015b, *Water Discharge and Reuse Guideline*, Sydney

TfNSW, 2015c, *Guide to Environmental Controls Map*, Sydney

TfNSW, 2015d, *Vegetation Management (Protection and Removal) Guideline*, Sydney

TfNSW, 2015e, *Fauna Management Guideline*, Sydney

TfNSW, 2015f, *Weed Management and Disposal Guide*, Sydney

TfNSW, 2015g, *Chemical Storage and Spill Response Guidelines*, Sydney

TfNSW, 2015h, *Air Quality Management Guideline*, Sydney

TfNSW, 2015i, *Concrete Washout Guideline - draft*, Sydney

Appendix A Consideration of matters of National Environmental Significance

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

Matters of NES	Impacts
<p>Any impact on a World Heritage property? There are no World Heritage properties within 1km of the Proposal.</p>	Nil
<p>Any impact on a National Heritage place? There are no National Heritage places within 1km of the Proposal.</p>	Nil
<p>Any impact on a wetland of international importance? There are no wetlands of international importance within 1km of the Proposal.</p>	Nil
<p>Any impact on a listed threatened species or communities? It is unlikely that the development of the Proposal would significantly affect listed threatened species or communities.</p>	Nil
<p>Any impacts on listed migratory species? It is unlikely that the development of the Proposal would significantly affect any listed migratory species.</p>	Nil
<p>Does the Proposal involve a nuclear action (including uranium mining)? The Proposal does not involve a nuclear action.</p>	Nil
<p>Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the vicinity of the Proposal.</p>	Nil
<p>Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? The Proposal is for a rail infrastructure facility and is not related to coal seam gas or coal mining.</p>	Nil
<p>Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be undertaken on or near any Commonwealth land.</p>	Nil

Appendix B Consideration of clause 228

The table below demonstrates 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>(a) Any environmental impact on a community?</p> <p>There would be some temporary impacts to the community during construction, particularly in relation to noise, traffic, access and visual amenity. The temporary closure of the existing Terminal Place car park would be an inconvenience to commuters, local shoppers, and owners of commercial premises. Mitigation measures outlined in Table 33 would be implemented to manage and minimise adverse impacts.</p>	Minor
<p>(b) Any transformation of a locality?</p> <p>The Proposal would include the introduction of new visible elements in the landscape through the construction of a new car park deck over the existing council/commuter car park that replaces an existing at-grade car park on Terminal Place as well as additional at-grade car park on Railway Terrace. The impact is considered to be minor as the proposed height of the car park is equivalent to the existing bus interchange, and the proposed at-grade parking is consistent with existing at-grade parking. Minor vegetation removal will be required to facilitate the development of the Proposal and will be subject to offsetting in accordance with the TfNSW <i>Vegetation Offset Guide</i> (9TP-ST-149/2.0).</p> <p>The Proposal would have a positive contribution to the locality by helping to address the high demand for car parking spaces for both commuter and commercial parking within Merrylands. The Proposal also provides infrastructure that supports potential growth and provides improved public transport facilities.</p>	Minor
<p>(c) Any environmental impact on the ecosystem of the locality?</p> <p>Minor vegetation removal will be required and will be subject to offsetting in accordance with the TfNSW <i>Vegetation Offset Guide</i> (9TP-ST-149/2.0). The Proposal is unlikely to impact the local ecosystem as discussed in Section 6.</p>	Nil
<p>(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</p> <p>There would be some temporary impacts during construction particularly in relation to noise, traffic and access and visual amenity. Minor vegetation removal will be required and will be subject to offsetting in accordance with the TfNSW <i>Vegetation Offset Guide</i> (9TP-ST-149/2.0).</p>	Minor

Factor	Impacts
<p>(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</p> <p>The Proposal would have a positive contribution to the locality by improving accessibility and capacity of car parking for commuters and local shoppers.</p> <p>The Proposal would have minor visual impacts on a heritage item listed under the Holroyd LEP and Sydney Trains s170 Heritage Conservation Register. Impacts to heritage would be minimised through the implementation of the mitigation measures provided in this REF.</p> <p>A desktop archaeological assessment has been undertaken which determined that there is a nil-low risk of encountering archaeological items and that the Proposal is unlikely to expose historical archaeological relics.</p>	Minor
<p>(f) Any impact on the habitat of protected fauna (within the meaning of the <i>National Parks and Wildlife Act 1974</i>)?</p> <p>The Proposal is unlikely to have any impact on the habitat of protected fauna. Minor vegetation will be removed to facilitate construction of the Proposal. An ecological assessment has confirmed that this vegetation does not provide habitat for protected fauna likely to occur in the locality.</p>	Nil
<p>(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</p> <p>The Proposal is unlikely to have any impact on endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air.</p>	Nil
<p>(h) Any long-term effects on the environment?</p> <p>The Proposal is unlikely to have any long-term effects on the environment.</p>	Nil
<p>(i) Any degradation of the quality of the environment?</p> <p>The Proposal is unlikely to have any degradation on the quality of the environment.</p>	Nil
<p>(j) Any risk to the safety of the environment?</p> <p>Construction of the Proposal would be managed in accordance with the mitigation measures outlined in this REF and a CEMP. The Proposal is unlikely to cause risks to the safety of the environment provided the recommended mitigation measures are implemented. Specific management measures would be implemented to manage asbestos and other hazardous materials that may be encountered during construction and demolition works.</p>	Nil
<p>(k) Any reduction in the range of beneficial uses of the environment?</p> <p>The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.</p>	Nil
<p>(l) Any pollution of the environment?</p> <p>The Proposal is unlikely to cause any pollution to the environment provided the recommended mitigation measures are implemented.</p>	Nil

Factor	Impacts
<p>(m) Any environmental problems associated with the disposal of waste?</p> <p>The Proposal is unlikely to cause any environmental problems associated with the disposal of waste. Hazardous waste and special waste may be generated from the Proposal. Waste would be classified and disposed of at a licensed waste facility.</p> <p>All waste would be managed and disposed of in accordance with a site-specific Waste Management Plan prepared as part of the CEMP. Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.</p>	Minor
<p>(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply?</p> <p>The Proposal is unlikely increase demands on resources that are or are likely to become in short supply.</p>	Nil
<p>(o) Any cumulative environmental effect with other existing or likely future activities?</p> <p>The cumulative effects of the Proposal are described in Section 6.12. Where feasible, environmental management measures would be co-ordinated to reduce any cumulative construction impacts. The Proposal is unlikely to have any significant adverse long-term impacts.</p>	Nil
<p>(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions?</p> <p>The Proposal would not affect or be affected by any coastal processes or hazards.</p>	Nil

Appendix C Sustainable Design Guidelines checklist

Compulsory initiatives

Initiative	Theme	Description	Design (D) or Construct (C) interface	Under consideration
C.1 Carbon footprint	Energy and greenhouse	Undertake AS14064-2 (greenhouse gases – project level) compliant carbon foot printing exercise for all projects with a capital investment value over \$10 million in accordance with Transport for NSW's Greenhouse Gas Inventory Guide for Construction Projects. The carbon footprint is to be used to inform decision-making in design and construction. Use standard carbon coefficient values for construction material and fuel usage. Monitor and report the carbon footprint every six months during construction.	DC	Yes
C.2 Building orientation and form	Energy and greenhouse	Optimise the building orientation and form to allow for maximum daylight levels (though avoiding overheating).	D	Yes
C.5 Renewable Energy	Energy and greenhouse	Purchase at least 25% of site-based electricity energy needs from Green Power or renewable sources during construction of the asset.	C	Yes
C.6 Climate change impact assessment	Climate resilience	Perform a climate change impact assessment for each project worth over \$10M using current scientific predictions (i.e. Intergovernmental Panel on Climate Change (IPCC), Commonwealth Scientific and Industrial Research Organisation (CSIRO) etc.) to determine the hazards/risks associated with future climatic conditions. Refer to 'Climate Change Impacts and Risk Management: A Guide for Business and Government' and the 'AGIC Guidelines for Climate Change Adaptation' for guidance.	D	Yes
C.7 Design for climate change	Climate resilience	All projects with a capital investment value over \$10 million to design out extreme, high and medium risks as identified in the climate change impact assessment where practicable.	D	Yes

Initiative	Theme	Description	Design (D) or Construct (C) interface	Under consideration
C.8 Whole of life costing	Materials and waste	Use whole of life costing methodologies (e.g. Life-Cycle Cost Analysis (LCCA) Method) in line with ISO 15686-5 to inform decision-making on significant issues pertaining to project scope options (e.g. route selection) and material/technology selection (e.g. steel versus concrete bridge). Significant issues can be determined using qualitative criteria such as likely scale of environmental impact.	DC	Yes
C.9 Reduce waste to landfill	Materials and waste	Ensure at least 95 per cent of construction and demolition waste (by weight) is diverted from landfill, and either recycled or reused, for all projects with a capital investment value over \$10 million.	DC	Yes
C.10 Reuse spoil	Materials and waste	For all projects generating >300m ³ of spoil, ensure that 100 per cent of usable spoil (by weight) is beneficially reused, onsite or nearby offsite. Usable spoil is not to be sent to landfill.	DC	Yes
C.11 Reduce cement	Materials and waste	Reduce the absolute quantity of Portland cement by at least 30 per cent, as an average across all concrete mixes, by substituting it with supplementary cementitious materials (such as a fly ash, ground granulated blast furnace slag or alkali activated cements) subject to meeting strength and durability requirements.	DC	Yes
C.12 Biodiversity offsetting	Biodiversity and heritage	For non-significant impacts (inside or outside the rail corridor) offsetting is to be in accordance with the TPD Vegetation Offset Guide as applicable.	DC	Yes
C.13 Heritage conservation and enhancement	Biodiversity and heritage	100 per cent of significant heritage items are identified during project development and design and are protected or beneficially reused where practical. This will require consultation with all relevant Indigenous Heritage groups (where applicable).	DC	Yes
C.14 Heritage interpretation	Biodiversity and heritage	Achieve interpretation of all applicable heritage or historic items through development and implementation of a heritage interpretation strategy (e.g. incorporate interpretive signage at the station, which provides information on the heritage of the area).	DC	Yes

Initiative	Theme	Description	Design (D) or Construct (C) interface	Under consideration
C.15 Water balance study	Water	Undertake a water balance study for the operational phase (including groundwater where applicable). The study will estimate ongoing water needs, and identify and assess opportunities for on-site capture and reuse, including non-potable water sources as appropriate.	D	Yes
C.16 Water efficient fittings	Water	Ensure onsite amenities using potable water comply with the following criteria: Toilets to be WELS (max 4.5/3 L/min) dual flush toilets; Urinals to be waterless; All taps to be WELS (max 7.5 L/min); (see Green Star Office v3). Any other water fixtures should achieve at least a 5 Star WELS rating.	DC	Yes
C.17 Water efficient controls	Water	Specify sensors, timers or spring loaded devices for taps where possible to reduce water loss from taps that are left running.	D	Yes
C.18 Monitor and record construction water	Water	Projects that have capital value greater than \$10 million are to monitor and record water consumption at the site office, all outlets available to the construction site and other water uses such as from non-potable sources.	C	Yes
C.19 Incorporate Water Sensitive Urban Design (WSUD)	Water	Retain hydrology features (i.e. streams, ponds etc.) and incorporate with surface water treatment systems e.g. retention basins. This can also be used to treat runoff from hard surfaces before going to stormwater to assist with flood prone areas. Wetland species should be planted in drainage areas to trap gross pollutants where appropriate. Refer to Australian Runoff Quality – A Guide to Water Sensitive Urban Design.	DC	Yes
C.20 Noise management	Pollution control	Project to comply with TfNSW <i>Construction Noise Strategy</i> and related conditions of approval.	DC	Yes
C.21 Community involvement in planning	Community benefit	Actively engage with stakeholders including the community during planning.	D	Yes
C.22 Planning framework		Plan and design projects to take into considerations existing planning strategies in consultation with relevant authorities.	D	Yes

Initiative	Theme	Description	Design (D) or Construct (C) interface	Under consideration
C.23 Crime Prevention Through Environmental Design (CPTED)	Community benefit	Incorporate CPTED principles during design. This may include natural observation and use of CCTV. Natural observation is achieved through fence, landscape, streetscape and open space design in public or staff supervised areas. This is achieved by minimising narrow corridors, hidden corners and through the use of lighting.	D	Yes

Discretionary initiatives

Initiative	Theme	Description	Design (D) or Construct (C) interface	Under consideration
1.7 Efficient vehicle circulation	Energy and greenhouse	Design layout with an efficient circulation pattern with a repetitive pattern and where possible avoid traffic jams in the car park.	D	Yes
1.8 Consider road intersections	Energy and greenhouse	Locate car park entries and exits clear of intersections and other locations of complex traffic movement. Minimise conflicts with pedestrians and cyclists and possible back up of traffic into the street. Locate where adequate sight distance to street traffic is available.	D	Yes
1.9 Ramping System	Energy and greenhouse	Design efficient ramping systems by considering site conditions, for example on sloping sites, split-floor/half level layouts enable an efficient ramp layout.	D	Yes
1.13 Green travel plans	Energy and greenhouse	Develop and implement green or sustainable travel plans during construction for employees to get to site offices and construction sites.	C	Yes
1.15 Light coloured finishes	Energy and greenhouse	Use light coloured finishes on floors, walls and ceilings of offices, stations and platforms to help reflect ambient light. Within car parks, consider glare and safety issues that may arise.	D	Yes
1.18 Motion controlled switches	Energy and greenhouse	Install lighting control systems that include motion sensors to control low traffic areas.	D	Yes
1.20 LED lights	Energy and greenhouse	Incorporate energy efficient LED lighting.	D	Yes
1.22 Lighting scheme	Energy and greenhouse	Prepare a lighting scheme by a suitably qualified lighting designer. Pay attention to zoning between lighting demands of different areas and strategic placement of lighting fixtures to maximise ground coverage.	D	Yes
1.25 Natural ventilation	Energy and greenhouse	Naturally ventilate structures (refer to AS1668.2-2002 (type 3)). Consider prevailing winds.	D	Yes
1.44 Vertical transport	Energy and greenhouse	Install energy efficient vertical transport systems (e.g. ramps; variable speed drive escalators that enable a slow-mode, so that they oscillate at lower speeds when not in use and increase in speed when users step into the foot panel at the entry to the escalator. Install and variable voltage variable frequency (VVVF) control gear for lifts.	D	Yes

Initiative	Theme	Description	Design (D) or Construct (C) interface	Under consideration
1.45 Stair placement to encourage use	Energy and greenhouse	Locate stairs along desire lines to encourage use. Provide stairs instead of escalators unless there is a 6 metre rise or greater, or a platform clearance or congestion issue. Maintain ramps or lifts for disabled access.	D	Yes
2.9 Protect sensitive assets	Climate resilience	Protect sensitive assets (e.g. lifts, escalators) from the effects of extreme climate and weather.	D	Yes
3.1 Sustainable procurement	Materials and waste	Develop a sustainable procurement strategy to be implemented during construction. The strategy must include at a minimum (i) a commitment to sustainable procurement in a relevant policy and/or plan, (ii) sustainability questions and requirements in tender documentation, (iii) a process for evaluating tenderers based on sustainability criteria including percentage tender evaluation weighting on sustainability and iv) sustainability requirements in subcontracts. Project teams should be able to demonstrate that the strategy has influenced procurement decision-making and outcomes.	DC	Yes
3.5 Optimise design	Materials and waste	Optimise design to minimise material consumption, mass/volume/space use and above ground land use.	D	Yes
3.14 Sustainable structural steel	Materials and waste	Source at least 60 per cent of structural steel (by weight) from a steel fabricator/contractor accredited by the Environmental Sustainability Charter of the Australian Steel Institute.	C	Yes
3.15 Lower embodied energy bar and mesh	Materials and waste	Source at least 60 per cent of bar and mesh that is produced through energy reduction processes such as Polymer Injection Technology.	C	Yes
3.17 Low VOC paints and finishes	Materials and waste	Specify low volatile organic compound (VOC) paints and finishes. Refer to Green Star – Office Interiors v1.1 available online.	DC	Yes
3.18 Low VOC adhesives and sealants	Materials and waste	Specify all adhesives and sealants as low VOC. Refer to Green Star – Office Interiors v1.1 available online.	DC	Yes
3.44 Adaptability	Materials and waste	Design structures for re-use/adaptability to minimise redundancy and/or rebuild.	D	Yes

Initiative	Theme	Description	Design (D) or Construct (C) interface	Under consideration
4.2 Ecological value opportunities	Biodiversity and heritage	Maximise ecological values through landscape species choice, and planting density and configuration. Make sure that appropriate weed management strategies are undertaken to avoid migration or contamination on and offsite.	DC	Yes
5.1 Rain water	Water	Store rain from roofs or shade structures in water tanks. Connect water tanks to a new or existing non-potable water reticulation system. Connect sub-meter to all outflow pipes from tanks.	D	Yes
5.10 Planting	Water	Select plant species that require minimal or no irrigation after establishment.	DC	Yes
5.13 Stormwater quality	Water	Install silt and oil separators to make sure scum and particulates are removed from stormwater.	D	Yes
5.15 Permeable and porous surfaces	Water	Design for permeable and porous surfaces to allow for stormwater infiltration (preferably with other treatments such as vegetated swales).	D	Yes
6.4 Avoid dangerous goods and hazardous materials	Pollution control	Use Safety Data Sheets (SDS) to avoid the use of dangerous goods and hazardous materials. See the materials section in Appendix B for details.	DC	Yes
6.6 Quiet car parks	Pollution control	Design car park to minimise noise during operation (e.g. low noise speed bumps and road surface).	D	Yes
6.17 Avoid glare and light pollution	Pollution control	Minimise ambient light levels and glare towards neighbouring properties (e.g. avoid or obstruct up lighting). Refer to ASA standard 3.11.3.3 for guidance and make sure that design complies with AS4282 Control of the Obtrusive Effects of Outdoor Lighting. Do not exceed minimum requirements of AS1158 for illuminance levels for 95 per cent of outdoor spaces.	D	Yes
7.3 Public art	Community benefit	Consult with the community over potential public art proposals.	DC	Yes
7.4 Weekend use	Community benefit	Allow for communal parking space use during non-peak commuting hours.	D	Yes

Initiative	Theme	Description	Design (D) or Construct (C) interface	Under consideration
7.5 Shared adaptive use	Community benefit	Design in adaptive use on the weekends/non-peak periods (e.g. consider how the car park may be converted into a market or festival space on the weekend).	D	Yes
7.8 Bicycle and pedestrian links	Community benefit	Optimise local pedestrian links to and between community facilities, such as sports grounds etc. Plan pathways within the asset to connect directly with existing pedestrian routes, centre activities and station entries. Design station building in a way to prevent it becoming a visual or psychological barrier to crossing the railway.	D	Yes
7.28 Bicycle lockers and/or racks	Community benefit	Provide sheltered bicycle lock ups and/or lockers in or near entrance to the station. Allow for at least 5% of staff use at maintenance facilities. See Section 3.9.3.1 of the ASA Station Design Standard Requirements for further information on bicycle parking requirements at stations.	D	Yes
7.39 Reduce graffiti	Community benefit	Minimise graffiti risks such as through treatment of fencing and other surfaces with anti-graffiti paint or coatings, vegetation cover to deter graffiti or providing designated walls for graffiti.	D	Yes
7.53 Wind	Community benefit	Design and locate multi-storey commuter car parks to avoid the creation of wind tunnels.	D	Yes

Appendix D Traffic Impact Assessment

Appendix E Visual Impact Assessment

Appendix F Noise and Vibration Impact Assessment

Appendix G Statement of Heritage Impact