NSW GOVERNMENT

Transport for NSW

Commuter Car Park Program North Rocks

Review of Environmental Factors

Artist's impression of the proposed North Rocks Commuter Car Park, subject to change during detailed design

January 2021

Contents

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Figures

Tables

Abbreviations

Term	Meaning
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AEP	Annual Exceedance Probability
ARI	Average Recurrence Interval
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CBD	Central Business District
CCTV	Closed Circuit Television
CEMP	Construction Environmental Management Plan
CLM Act	*Contaminated Land Management Act 1997* (NSW)
CNVMP	Construction Noise and Vibration Management Plan
DAWE	Department of Agriculture, Water and the Environment (Cwlth)
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
DDA	*Disability Discrimination Act 1992* (Cwlth)
DPIE	NSW Department of Planning, Industry and Environment
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
DSI	Detailed Site Investigation (Phase II Contamination Investigation)
ECM	Environmental Controls Map
EES	NSW Environment, Energy and Science (Division of Department of Planning Industry and Environment) (formerly OEH)
EMS	Environmental Management System
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)

Term	Meaning
GDE	Groundwater Dependent Ecosystem
Heritage Act	*Heritage Act 1977* (NSW)
HV	High Voltage
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2000).
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)
LEP	Local Environmental Plan
LGA	Local Government Area
NES	National Environmental Significance
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	(former) NSW Office of the Environment and Heritage
OOHW	Out of hours works
PDP	Public Domain Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Roads Act	*Roads Act 1993* (NSW)
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
TCP	Traffic Control Plan
TfNSW	Transport for NSW
TMP	Traffic Management Plan
TPZ	Tree Protection Zone
UDLP	Urban Design and Landscape Plan
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
WM Act	*Water Management Act 2000* (NSW)

Definitions

Term	Meaning
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 Transport for NSW 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 project by refining the concept design presented in the REF and completing the detailed design so that it is suitable for construction (subject to Transport for NSW acceptance). The Contractor is therefore responsible for all work on the project, 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 Transport for NSW acceptance).
Disability Standards for Accessible Public Transport	The Commonwealth *Disability Standards for Accessible Public Transport 2002* ("Transport Standards") (as amended) are a set of legally enforceable standards, authorised under the Commonwealth *Disability Discrimination Act 1992* (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.
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).
Opal card	The integrated ticketing smartcard being introduced by Transport for NSW.
Out of hours works	Defined as works *outside* standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act - in this instance, Transport for NSW.
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.

Term	Meaning
The Proposal	The construction and operation of the North Rocks Commuter Car Park.
Vegetation Offset Guide	The Transport for NSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 5.5 of the EP&A Act. The Guide provides 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.

Executive summary

Overview

Transport for NSW (TfNSW) is proposing to construct the North Rocks Commuter Car Park (the Proposal) to improve customer experience at this location and in surrounding localities. Transport for NSW is the government agency responsible for the delivery of major transport infrastructure projects in NSW and is the proponent for the Proposal.

The Proposal forms part of the Commuter Car Park Program. The NSW Government is committed to delivering accessible public transport infrastructure, which is why Transport for NSW is providing more commuter car parks where they are needed. The delivery of commuter car parks at key transport interchanges will provide a range of benefits, including:

- improved customer access to the public transport network
- encouraging mode shift away from private vehicles
- improving the flexibility and reliability of customer's 'first and last mile' of their journey
- contributing to reducing congestion on our road network.

As part of this program, the Proposal would aim to provide around 135 commuter car parking spaces at the M2 Barclay Road Bus Interchange.

The Proposal would include the following key features:

- enabling works including site investigations, cut and fill bulk earthworks and site clearance of existing landscaping and perimeter trees
- provision of an at-grade car park, comprising:
    - around 135 car parking spaces, including 3 accessible parking spaces either within the existing Barclay Road Commuter Car Park or within the new commuter car park
    - wayfinding signage for pedestrian and vehicular circulation
    - new line-marking
    - retaining walls between car parking terraces
    - Transport Park&Ride infrastructure
- landscaping works including:
    - retaining wall along Perry Street
    - soft landscaping
    - pedestrian footpaths and lighting
- ancillary works including stormwater drainage and on-site detention tank, services relocation and/or adjustments, installation of boom gates and handrails
- new infrastructure including CCTV cameras, subject to requirements resulting from the detailed design security risk assessment
- new driveway crossing and layback for vehicular entry and exit on Perry Street and where necessary footpath improvements
- temporary site compounds for storage of equipment and materials, as well as site offices and amenities.

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

This Review of Environmental Factors (REF) has been prepared to assess all matters affecting or likely to affect the environment by reason of the construction and operation of the Proposal under the provisions of Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

Subject to approval, construction is expected to commence in mid-2021 and take around 12 months to complete. A detailed description of the Proposal is provided in Chapter 3 of this REF. An overview of the Proposal is shown in Figure E-1 and a photomontage of the Proposal is shown in Figure E-3.

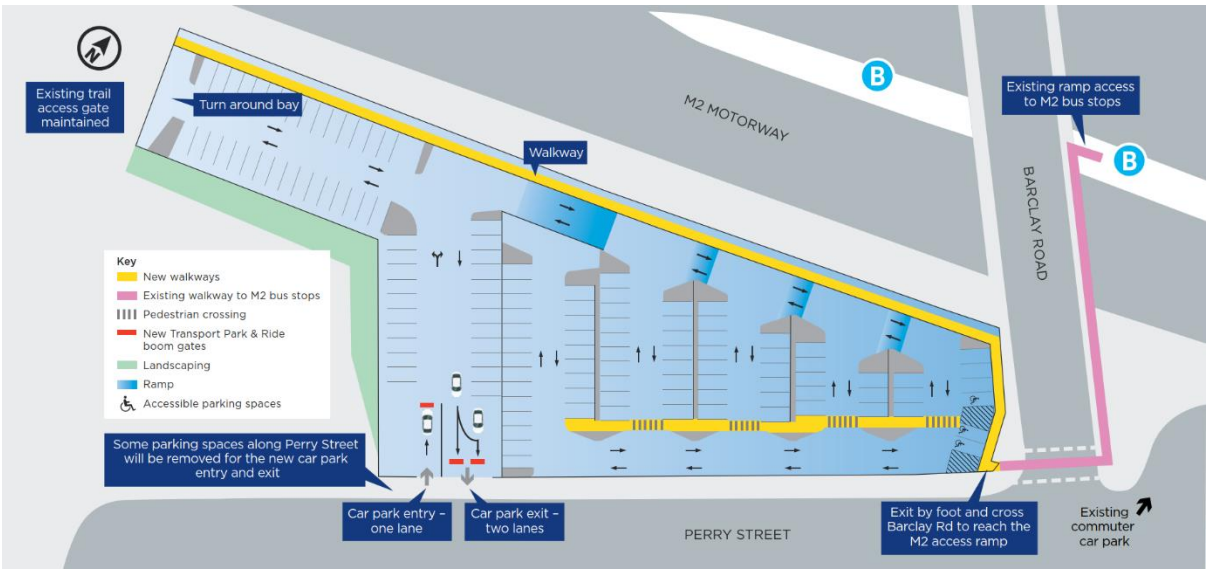

Figure E-1 Overview of proposed commuter car park (indicative only, subject to detailed design).

Need for the Proposal

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

Transport for NSW recognises the critical role commuter car parks play in improving the quality of access to public transport in the customer's first and last mile, particularly in middle and outer metropolitan areas.

Around 73 per cent of workers from the middle and outer urban sectors of Sydney predominantly drive the whole distance to work, with around 46 per cent of those workers commuting 20 kilometres to 60 kilometres daily (Australian Bureau of Statistics, 2016).

Improving the transport experience for customers is the focus of NSW Government transport initiatives. 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.

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

Targeted community and stakeholder consultation

Targeted community and stakeholder consultation activities for the Proposal were undertaken from Friday 4 December to Friday 18 December 2020. Further information about these specific consultation activities is included in Section 5 of this REF.

In accordance with the requirements of the *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP), consultation is required with local councils and/or public authorities in certain circumstances, including where council managed infrastructure is affected. Consultation has been undertaken with the City of Parramatta Council during the development of design options and the preferred option. City of Parramatta Council provided a written response on 6 January 2021, which is discussed in Section 5 of this REF. Consultation with the City of Parramatta Council would continue through the detailed design and construction of the Proposal.

Transport for NSW has reviewed and assessed all feedback received during the consultation period, prior to determining whether or not to proceed with the Proposal.

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

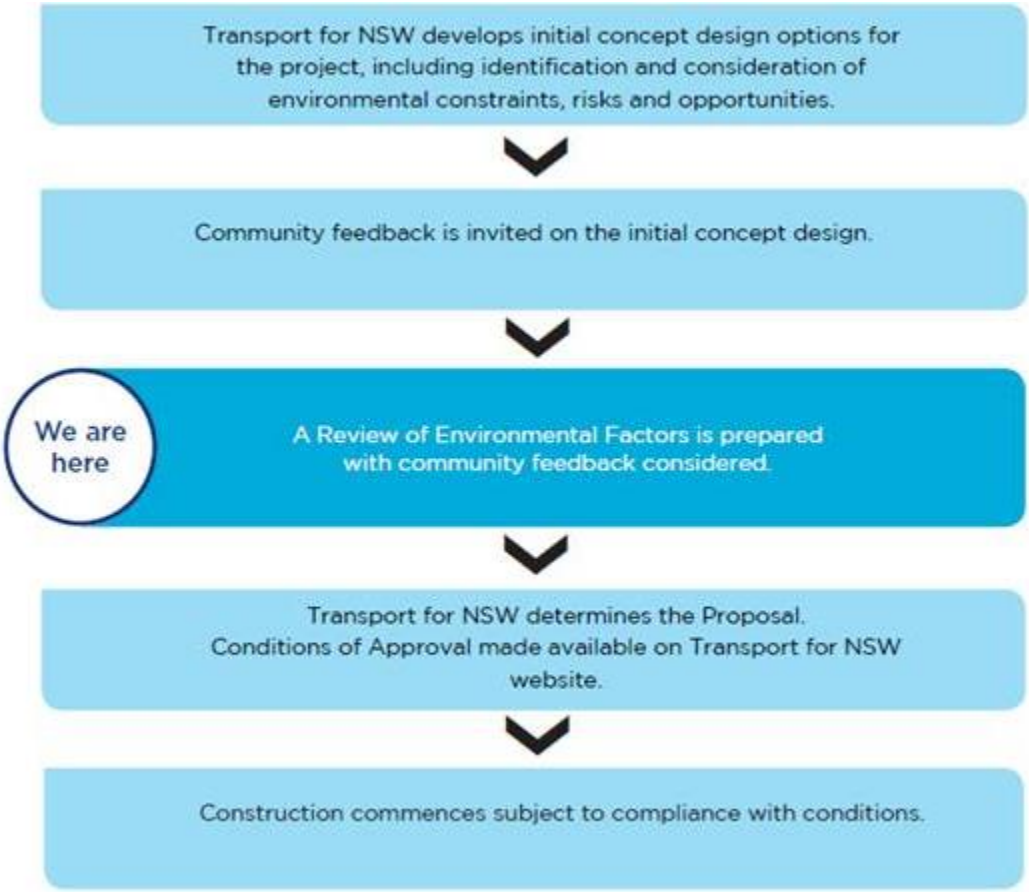

Figure E-2 Planning approval and consultation process for the Proposal

Environmental impact assessment

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

The Proposal would provide the following benefits:

- additional commuter parking in close proximity to the M2 Barclay Road Bus Interchange, facilitating improved opportunities to change modes of transport
- increasing accessibility and convenience to and from the M2 Barclay Road Bus Interchange, potentially increasing the use of public transport and encouraging a mode shift away from private vehicles
- improved customer experience by providing modern car parking facilities with security features including lighting reduction in the need for commuters to park in local residential streets, potentially improving traffic and road safety.

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

- a minor increase in local traffic movements during operation of the Proposal
- the Proposal would result in a noticeable visual change and greater views to the site through the removal of trees and the grassed mound, however this visual impact is mitigated by a highly limited visual catchment and proposed landscaping features
- an area of up to 0.057 ha, including native trees, would likely be cleared, resulting in localised impacts to a small area of native vegetation and fauna habitat in the western corner of the site. Loss of vegetation within the Proposal site would be offset in accordance with the *Vegetation Offset Guide* (Transport for NSW, 2019m)
- temporary visual, noise and vibration impacts during the construction period.

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

Conclusion

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

The detailed design of the Proposal would also be designed in accordance with the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2019a) taking into account the principles of ecologically sustainable development (ESD).

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

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

Figure E-3 Photomontage of the Proposal

1 Introduction

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

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

The M2 Barclay Road Bus Interchange is currently served by the M2 Hills Motorway, with access for customers via Barclay Road. An existing at-grade commuter car park located north of Barclay Road includes 89 spaces. Observations before the COVID-19 pandemic noted up to 200 cars using overflow parking on local streets. The development of a new at-grade commuter car park at North Rocks would assist in addressing the existing parking shortage in the immediate vicinity of the M2 Barclay Road Bus Interchange and increase commuter connectivity to the greater Sydney area, consistent with the *A Metropolis of Three Cities & Central City District Plan 2018*.

1.1.2 Key features of the Proposal

The Proposal, which forms part of the Commuter Car Park Program, involves the construction and operation of an at-grade car park with integration into the existing road and pedestrian network around the M2 Barclay Road Bus Interchange.

The key features of the Proposal are summarised as follows:

- enabling works including site investigations, cut and fill bulk earthworks and site clearance of existing landscaping and perimeter trees
- provision of an at-grade car park, comprising:
  - around 135 car parking spaces, including 3 accessible parking spaces either within the existing Barclay Road Commuter Car Park or within the new commuter car park
  - wayfinding signage for pedestrian and vehicular circulation
  - new line-marking
  - retaining walls between car parking terraces
  - Transport Park&Ride infrastructure
- landscaping works including:
  - retaining wall along Perry Street
  - soft landscaping
  - pedestrian footpaths and lighting
- ancillary works including stormwater drainage and on-site detention tank, services relocation and/or adjustments, installation of boom gates and handrails
- new infrastructure including CCTV cameras, subject to requirements resulting from the detailed design security risk assessment
- new driveway crossing and layback for vehicular entry and exit on Perry Street and where necessary footpath improvements

- temporary site compounds for storage of equipment and materials, as well as site offices and amenities.

Subject to planning approval, construction is expected to commence in mid-2021 and take around 12 months to complete.

A detailed description of the Proposal is provided in Chapter 3 of this Review of Environmental Factors (REF).

1.2 Location of the Proposal

The Proposal is located in the suburb of North Rocks, NSW, around 20km north west of the Sydney Central Business District (CBD). It lies within the City of Parramatta Local Government Area (LGA). The Site is located at 102-106 Barclay Road, adjacent to the M2 Barclay Road Bus Interchange, which provides services to and from the Sydney CBD, Macquarie Park and Blacktown; Macquarie Park to Castle Hill (via Baulkham Hills); and City QVB to Tallawong Station (Night Service). The regional location of the Proposal is shown in Figure 1-1.

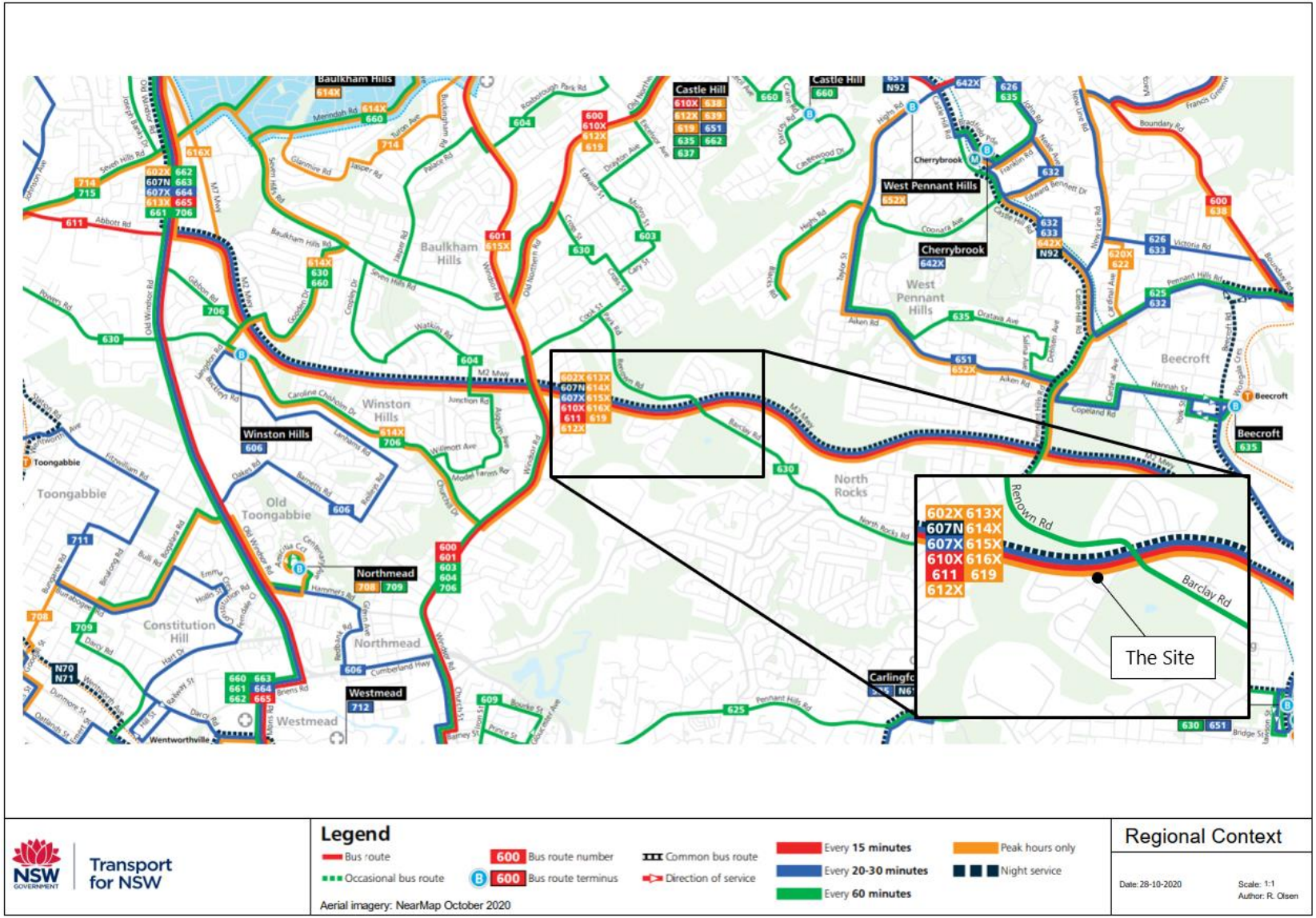

Figure 1-1 Regional context (Source: Hills Bus, 2020)

1.3 Existing infrastructure and land uses

The Proposal is located at a vacant block on the corner of Perry Street and Barclay Road, above the M2 Barclay Road Bus Interchange in North Rocks, NSW, as shown in Figure 1-2. The Proposal site is legally described as part Lot 170 DP 1151136. The ancillary site is located along Perry Street and within the Barclay Road commuter car park. An approximate location of the ancillary works is shown in Figure 1-2.

The Proposal site's topography has been heavily modified over time. The site was previously used as a construction compound during the NorthConnex project, during which time the ground surface was modified. Modification during this time involved the relocation of an existing earth stockpile to other areas within the site. The earth stockpile was returned to its approximate pre-construction state by NorthConnex prior to the site being handed back to Transurban.

The Proposal site's current topography slopes from an elevation of around 100 metres Australian High Datum (AHD) in the north-east to around 86 metres AHD in the south west. The north portion of the site elevation is a result of fill material (FutureRail, 2020a).

To the north west, the Proposal site is bounded by the M2 Hills Motorway corridor. To the south east is the Muirfield Golf Club. To the south west of the Proposal site is a low density residential area, and to the north east is the existing commuter car park.

Figure 1-2 Site locality map

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by Advisian Pty Ltd on behalf of Transport for NSW to assess the potential impacts of the North Rocks Commuter Car Park. For the purposes of these works, Transport for NSW is the proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

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

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

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

2 Need for the Proposal

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

2.1 Strategic justification

Improving transport customer experience is the focus of the NSW Government's transport initiatives. Transport interchanges and train stations are 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 proposed North Rocks Commuter Car Park, the subject of this REF, forms part of the Commuter Car Park Program. This program is designed to improve customer access to the public transport network, encourage a mode shift away from private vehicles, and reduce congestion on our road network.

In September 2015, the NSW Government announced a series of State Priorities as part of *NSW: Making It Happen* (NSW Government, 2015). The State Priorities are intended to guide the ongoing actions of the NSW Government across the State, and guide resource allocation and investment in conjunction with the NSW Budget. *NSW: Making it Happen* focuses on 12 key 'priorities' to achieve the NSW Government's commitments. These priorities range across a number of issues including infrastructure, the environment, education, health, wellbeing and safety in addition to Government services.

One of the 12 priorities relates to investment in building infrastructure. The ongoing development and investment in transport infrastructure is identified as part of the wider building infrastructure priority. The Proposal assists in meeting the priority by improving accessibility to public transport and encouraging greater use of public transport.

The NSW Government has developed *Future Transport Strategy 2056* (Transport for NSW, 2018a). This plan provides a comprehensive strategy for all modes of transport across NSW over the next 40 years, while also delivering on current commitments.

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.

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

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

Policy / Strategy	Overview	How the Proposal aligns
Future Transport Strategy 2056 (TfNSW, 2018a)	*Future Transport 2056* is an update of NSW's *Long Term Transport Master Plan*. It is a suite of strategies and plans for transport to provide an integrated vision for the state. *Future Transport 2056* identifies 12 customer outcomes to guide transport investment in Greater Sydney. These outcomes include transport providing convenient access, supporting attractive places and providing 30-minute access for customers to their nearest centre by public transport.	The Proposal would deliver on the connecting people and places in the growing city outcome by enabling 30 minute access for customers to their nearest metropolitan city centre and strategic centre by public transport seven days a week. Additionally, by encouraging public transport use, the Proposal would support the sustainability objective (outcome 6) by intercepting customers earlier in their journey and helping to reduce the number of cars on the

Policy / Strategy	Overview	How the Proposal aligns
		roads, resulting in (net) less emissions.
Disability Inclusion Action Plan (2018-2022) (TfNSW, 2017a)	The *Disability Inclusion Action Plan 2018-2022* was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, which consists of representatives from peak disability and ageing organisations within NSW. The Disability Plan identifies the challenges, the achievements to date, the considerable undertaking that is required to finish the job and provides a solid and practical foundation for future progress over the next five years.	The Proposal would support transfers between modes that form a continuous journey, which may include driving to the commuter car park before joining a bus service at the M2 Barclay Road Bus Interchange.
A Metropolis of Three Cities - Greater Sydney Region Plan (Greater Sydney Commission, 2018)	The *Greater Sydney Region Plan* is the NSW Government's 40-year land use plan for Sydney. It establishes a vision for a metropolis of three cities – the Eastern Harbour City, Central River City and Western Parkland City.	The Proposal particularly supports Direction 6 of the Plan, which is to create a 'well-connected city' by ensuring services and infrastructure meet communities' changing needs. The Proposal would be consistent with this direction by providing facilities that support the operation of public transport services at the M2 Barclay Road Bus Interchange.
Central City District Plan (Greater Sydney Commission, 2018)	The Central City District Plan applies to the Blacktown, Cumberland, Parramatta and The Hills local government areas. The plan describes the planning priorities and actions to improve liveability and achieve a productive and sustainable future for the District. The plan is developed to support the objectives of the *Greater Sydney Region Plan**.***	Of the 22 planning priorities outlined in the plan, the Proposal particularly supports the following: • Planning Priority C1: Planning for a city supported by infrastructure • Planning Priority C9: Delivering integrated land use and transport planning in a 30-minute city • Planning Priority C19: Reducing carbon emissions and managing energy, water and waste efficiently.
Building Momentum – State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)	The *State Infrastructure Strategy 2018-2038* makes recommendations for each of NSW's key infrastructure sectors including transport. The strategy sets out the Government's priorities for the next 20 years, and combined with the *Future Transport Strategy 2056* and the *Greater Sydney Region Plan*, brings together infrastructure investment and land-use planning for our cities and regions.	The Proposal supports the strategic objective of the Strategy by ensuring the transport system creates opportunities for people and businesses to access the services and support they need. The Proposal is also consistent with the overall aims and objectives of the *Future Transport Strategy 2056* to improve transport infrastructure across NSW.
NSW: Premier Priorities *(NSW Government, 2019)*	In June 2019, 14 new Premier's Priorities were announced that would allow the Government to measure and deliver in areas where NSW can do	The Proposal would assist in meeting the key *Premier Priority* of developing well connected communities with quality local environments by investing in transport infrastructure and

Policy / Strategy	Overview	How the Proposal aligns
https://www.nsw.gov.au/improving-nsw/premiers-priorities/	better. The key policy priorities, include the following: • a strong economy • highest quality education • well-connected communities with quality local environments • putting customer at the centre of everything we do • breaking the cycle of disadvantage.	approving accessibility to public transport and encouraging greater use of public transport.
Parramatta Community Strategic Plan 2018-2038 *(City of Parramatta, 2018)*	The *Parramatta Community Strategic Plan 2018-2038* is the City of Parramatta's 20-year plan and is built around six key goals, including the following: • Fair • Accessible • Green • Welcoming • Thriving • Innovative.	The Proposal would assist in meeting the plans' goal of providing greater means of accessibility by managing traffic congestion and access to parking.

2.1.1 Future Transport Context

Commuter parking requirements at the M2 Barclay Road Bus Interchange may look very different in the future compared to today. Planning for future parking demand must take into consideration the broader strategic vision for transport in Greater Sydney, as it is likely to change travel patterns and behaviours in North Rocks and the Greater Parramatta region.

Future Transport 2056 (Transport for NSW, 2018a) outlines the NSW Government's vision for a connected roads and public transport network that has higher capacity, and gives people the freedom to choose how and when they get around, no matter where they live and work. It acknowledges that over the next 40 years, Greater Sydney is forecast to grow from a city of 5 million to 8 million people. At the same time, technology advancements will reshape how people and goods move around our city.

The *Future Transport Greater Sydney Services and Infrastructure Plan* as part of the *Future Transport 2056* (Transport for NSW, 2018a) outlines the priorities Transport for NSW need to focus on to address the opportunities and challenges ahead and fundamentally reshape the city and the way people and goods move. Transport for NSW's focus is enabling people and goods to move safely, efficiently and reliably around Greater Sydney.

Instead of focusing on one CBD, the Greater Sydney Commission has established a vision for Sydney as a metropolis of three cities (Western Parkland City, the Central River City and Eastern Harbour City) where people have access to jobs and services within 30 minutes by public transport, seven days a week. Achieving this will require more efficient modes of transport – public transport, shared transport and walking and cycling – to play a greater role.

2.2 Objectives of the Commuter Car Park Program

Transport for NSW is committed to delivering accessible public transport infrastructure, which is why Transport for NSW are providing more commuter car parks through the Commuter Car Park Program. The Commuter Car Park Program is an NSW Government initiative to provide

a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

The objective of the Commuter Car Park Program is to extend the reach of the public transport network in middle and outer metropolitan Sydney by intercepting customers earlier in their journey. The delivery of commuter car parks at key transport interchanges aims to provide a range of benefits as outlined in Table 2-2.

Table 2-2 Objectives of the Commuter Car Park Program

Category	Objectives
Accessible services	• increase access to public transport for customers in their 'first and last mile' journey
Successful Places	• complement and integrate with existing and future communities and support economic and place-making objectives in centres.
Efficient connectivity for passengers	• develop efficient transport interchanges to enable people to reach more destinations within and between cities and centres by enabling the 30 minute city through comparative or improved travel time with private vehicle travel • replace car trips to destinations and centres with alternative public and active transport modes
Safety and Performance	• provide a safe multi-modal transport journey by design • improve the effectiveness of interchanging
Adaptability	• support the future needs of customers and consider emerging transport trends, growth and technologies • plan and design infrastructure that is resilient and able to adapt to future alternative uses and scenarios
Sustainability	• to deliver whole of life value for money • limit environmental impacts and contribute to the NSW Government's aspirational target to achieve net-zero emissions by 2050 • maximise the construction phase benefits to the local economy by utilising local businesses and engaging a workforce that reflects the local social demographic of the area

2.3 Objectives of the Proposal

The objectives of the Proposal have been prepared with consideration of the overarching objectives of the Commuter Car Park Program (refer to Section 2.1.1).

The specific objectives of the North Rocks Commuter Car Park are to:

- provide additional commuter parking in close proximity to the M2 Barclay Road Bus Interchange to service increasing demand
- improve accessibility to transport linkages for employment and recreation
- improve customer experience (better interchange facilities)
- improve integration with surrounding precinct
- improve customer safety
- improve customer amenity.

2.4 Design development

In September 2020 FutureRail finalised a Definition Design Report for the North Rocks Commuter Car Park and Bus Interchange Lift (FutureRail, 2020b). The report examined the existing site conditions, interchange and design constraints, and identified options for improvement.

The report identified that a total of 14 routes service the M2 Barclay Road Bus Interchange, linking North Rocks to Tallawong and the Sydney CBD. During the morning peak period, the interchange is serviced by around 260 buses, with patronage patterns at the interchange showing high entries in the morning peak period and high exits in the evening peak period, which is characteristic of a commuter journey.

The capacity of the existing commuter car park on Barclay Road opposite the Proposal site is 89 car parking spaces (including three accessible spaces). Around 200 additional cars were observed before the COVID-19 pandemic as using the surrounding streets as overflow car parking. This overflow parking occurred along Perry Street, Carlton Road, Hepburn Road, Mill Drive and Alderson Avenue, up to 700 metres from the interchange (FutureRail, 2020b). Current commuter parking at the interchange does not adequately meet the needs of customers, which increases the use of surrounding local streets for parking.

The report also identified a number of geotechnical and engineering constraints, discussed further in Section 3.3.

Concept design has been developed to address the below issues, and would be refined further during detailed design, subject to planning approval.

2.5 Alternative options considered

Investigations were undertaken to identify potential design options for additional commuter car parking near the M2 Barclay Road Bus Interchange. Options considered for the Proposal are outlined below.

2.5.1 Option 1 – At-grade Commuter Car Park

An at-grade car park option on the corner of Perry Street and Barclay Road would allow for around 135 commuter car parking spaces to service the M2 Barclay Road Bus Interchange. The site could also connect to existing pedestrian infrastructure on Barclay Road from the site to the interchange.

Ancillary works would be confirmed during detailed design and would include the upgrade of a pedestrian footpath along Perry Street (where required), as well as the removal of a kerb within the Barclay Road commuter car park and replacement with an accessible ramp and path. A number of car park spaces within the Barclay Road commuter car park may be converted into accessible spaces to achieve optimal number of car park spaces.

Development of an at-grade car park on a vacant block of land would minimise displacement of existing commuter car parking spaces during the construction phase and minimise disruption to commuters.

2.5.2 Option 2 - The ‘do-nothing’ option

Under a ‘do-nothing’ option, there would be no changes to the way the existing car parking arrangements in the area currently operates, being the use of the existing car park on Barclay Road and the utilisation of nearby residential streets for parking. The ‘do nothing’ option would not address the future demand for commuter car parking in the area, potentially limiting the use and investment in public transport and adding to vehicular kilometres for commuter journeys.

The current commuter car parking available around the M2 Barclay Road Bus Interchange is not adequate to meet the current and future demands of commuters using the interchange. Commuters are currently using on-street parking in nearby residential streets due to the existing car park reaching capacity on weekdays.

The ‘do nothing‘ option was not considered a feasible alternative as it would be inconsistent with NSW Government objectives and would not assist in encouraging the use of public transport, and would not meet the immediate needs of the North Rocks community.

2.5.3 Assessment of identified options

The design options were assessed in a Strategic Merit Test (SMT) and multi-criteria analysis (MCA) that included consideration of factors such as customer experience, accessibility, engineering constraints, modal integration and cost to select a preferred option.

2.6 Justification for the preferred option

The need for providing additional commuter car parking in the vicinity of the M2 Barclay Road Bus Interchange is considerable. Site investigations undertaken before the COVID-19 pandemic found that around 200 commuters park in surrounding residential streets, as far as 700 metres from the interchange, creating congestion and hazards in the nearby residential areas (FutureRail, 2020b).

The additional car parking spaces would make public transport a more viable alternative to road transport, making it easier to access employment opportunities, education facilities and key destinations in the greater Sydney area, as well as reducing congestion.

The Proposal is considered the best outcome for commuters and future residents of the North Rocks suburb as it would assist in addressing the existing parking shortage in the immediate vicinity of the M2 Barclay Road Bus Interchange and increase commuter connectivity to the greater Sydney area.

The Proposal would not only be functional, but sustainable and visual elements, such as retaining walls and landscaping, would be key factors considered as part of the detailed design process.

3 Proposal description

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

3.1 The Proposal

The Proposal involves the construction of an at-grade car park in North Rocks, Sydney, as part of the Commuter Car Park Program which would provide customers with more convenient access to public transport at the M2 Barclay Road Bus Interchange and help ease congestion on the roads.

The Proposal would include the following key elements:

- enabling works including site investigations, cut and fill bulk earthworks and site clearance of existing landscaping and perimeter trees
- provision of an at-grade car park, comprising:
    - around 135 car parking spaces, including 3 accessible parking spaces either within the existing Barclay Road Commuter Car Park or within the new commuter car park
    - wayfinding signage for pedestrian and vehicular circulation
    - new line-marking
    - retaining walls between car parking terraces
    - Transport Park&Ride infrastructure
- landscaping works including:
    - retaining wall along Perry Street
    - soft landscaping
    - pedestrian footpaths and lighting
- ancillary works including stormwater drainage and on-site detention tank, services relocation and/or adjustments, installation of boom gates and handrails
- new infrastructure including CCTV cameras, subject to requirements resulting from the detailed design security risk assessment
- new driveway crossing and layback for vehicular entry and exit on Perry Street and where necessary footpath improvements
- temporary site compounds for storage of equipment and materials, as well as site offices and amenities.

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

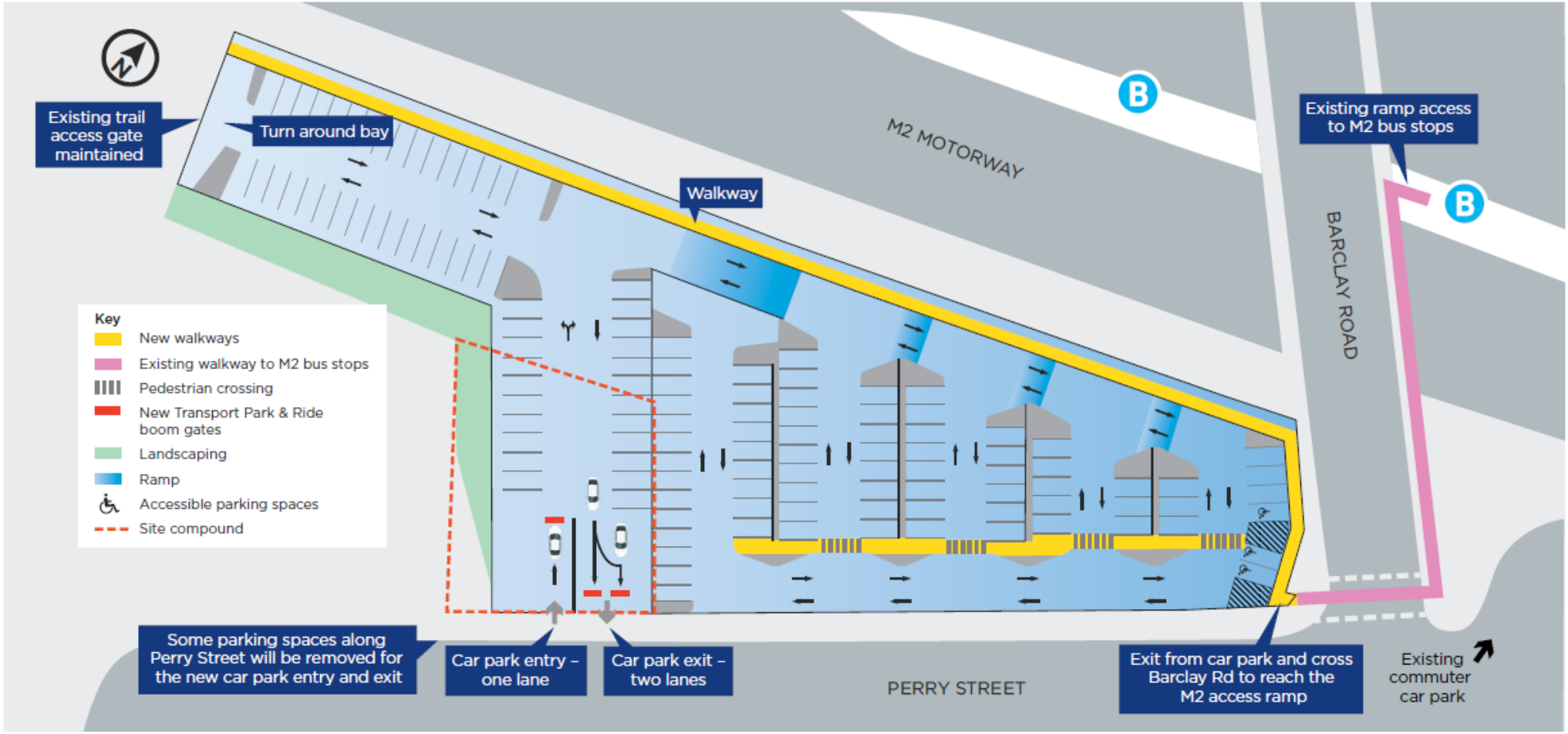

Figure 3-1 Overview of proposed commuter car park (Indicative only, subject to detailed design).

3.2 Scope of works

3.2.1 Commuter car park

The Proposal involves the provision of additional commuter car parking for the M2 Barclay Road Bus Interchange as part of the Commuter Car Park Program. The Proposal involves the construction and operation of an at-grade commuter Transport Park&Ride car park with around 135 commuter car spaces which is accessed from Perry Street, North Rocks.

Details of the proposed works to improve accessibility and customer experience are provided below:

- provision of an at-grade commuter car park, including:
  - around 135 commuter car parking spaces, including around 3 accessible parking spaces either within existing Barclay Road Commuter Car Park or within the new commuter car park
  - two-way circulation ramps between at-grade car parking bay terraces
  - retaining wall along Perry Street
  - five retaining walls between parking bay terraces
  - Transport Park&Ride infrastructure including boom gates
  - new driveway crossing and layback on Perry Street for one entry and two exit lanes
- installation of pedestrian footpaths, lighting, handrails, underground stormwater drains and on-site detention tank
- removal of four medium and three large trees and existing landscaping
- earthworks including cutting, filling and grading of material on the site
- establishment of temporary site compounds for storage of materials and equipment as well as site offices
- landscaping works
- new wayfinding signage and provision of the statutory/regulatory signage
- new line-marking
- new driveway crossing and layback on Perry Street
- services relocation and/or adjustments, including overhead wiring and sewer diversion
- power supply upgrade works, which could include an upgrade to the existing transformer or the installation of a padmount substation (specific power requirements to be determined during detailed design)
- adjustments to boundary fencing.

3.2.2 Materials and finishes

The Proposal involves the provision of an asphalt slab for the at-grade car park, retaining walls, pedestrian footpaths and fencing.

Selection of materials and finishes would be confirmed as part of the detailed design process, and would include consideration of the following:

- materials are to be selected on the basis of sustainability principles, in particular lower carbon content, use of recycled materials and properties assist with the reduction of the urban heat island effect. Such materials may include lower carbon content concrete and permeable paving
- materials and finishes to be selected based on the criteria of durability, low maintenance and cost effectiveness, to minimise visual impacts, and to be aesthetically pleasing
- availability and constructability criteria to ensure resources are readily available, and for the car park to be constructed with ease and proficiency.

Consideration would also be given to life cycle impacts which are calculated by assessing the environmental impacts of materials from the point of extraction, through to transportation, use, operation and end of life.

Each of the new elements 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:

- retaining walls between each terrace
- retaining wall along Perry Street
- pedestrian footpaths
- handrails if required
- car park surface – asphalt and/or concrete.

An Urban Design and Landscape Plan (UDLP) would be prepared by the Contractor, prior to finalisation of detailed design for endorsement by Transport for NSW.

3.3 Design development

3.3.1 Engineering constraints

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

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

- Endeavour Energy aerial electrical wire and street lighting
- Sydney Water sewer main and water main
- NBN/Telstra optic fibre cables.

In addition, there is a pad-mounted transformer located along the south eastern boundary.

Topography: The Proposal site's current topography slopes from around 100 metres AHD in the north-east to around 86 metres AHD in the south west. The north portion of the site elevation is a result of fill material (FutureRail, 2020a). The Proposal requires a cutting of around 7,000 cubic metres and fill area of around 2,800 cubic metres, and would result in around 4,200 cubic metres of surplus material (FutureRail, 2020b). The detailed design of the car park would consider the retention of excavated material on site. If retention of surplus material is not possible, this material would be removed off-site to a licensed facility.

Trees: The Proposal site comprises a number of mature native and introduced trees. These may need to be removed prior to the commencement of construction activities. The trees and their offsetting are discussed in further detail in Section 6.7.

3.3.2 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 (BCA)
- relevant Australian Standards
- *Guidelines for the Development of Public Transport Interchange Facilities* (Ministry of Transport, 2008)
- Crime Prevention Through Environmental Design principles
- Transport for NSW Urban Design Guidelines
- *NSW Sustainability Design Guidelines - Version 4.0*
- other Transport for NSW policies and guidelines
- council standards where relevant.

3.3.3 Sustainability in design

The development of the concept design for the Proposal has been undertaken in accordance with the project targets identified in Transport for NSW's Environmental Management System (EMS) and the *NSW Sustainable Design Guidelines - Version 4.0* (TfNSW, 2019a) which groups sustainability into seven themes:

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

There are 14 compulsory requirements and 2 sub requirements that project teams are required to implement when there is confirmation that these individual initiatives are applicable to the project. Each compulsory requirement has an associated list of supporting initiatives.

These compulsory requirements have been reviewed and incorporated into the concept design (unless otherwise justified) and documented in a Sustainable Design Guidelines checklist that was approved by Transport for NSW. The checklist and the requirements contained within would be reviewed again at the detailed design and construction phases, and submitted for approval by Transport for NSW.

3.4 Construction activities

3.4.1 Work methodology

Subject to approval, construction is expected to commence in mid-2021 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 Transport for NSW.

It is anticipated that the size of the work force would vary in size from around 18 personnel per day during the enabling works phase and peak and around 40 personnel per day during placement of the asphalt layer at the height of construction activities.

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

Table 3-1 Indicative construction staging for key activities

Stage	Activities
Site establishment and enabling works	• secure site perimeter boundary with temporary fencing • undertake survey to identify site boundary and mark out existing services • clear site of any existing vegetation not being retained and remove any spoil stockpiles • establish site office, amenities and plant/material storage areas • establish environmental controls, such as erosion and sediment controls • install protective overhead wiring conductor flagging along Perry Street • establish traffic controls.
Excavation works	• provide necessary services to various points within the car park footprint • undertake excavation works, test and remove spoil from site • construction of stormwater drains and detention tank.
Retaining wall construction	• construct retaining walls, backfill of retaining walls.
Construct car park slab	• construction of sub-base layer, asphalt and drainage • modifications to Perry Street as required for entrance and exit into car park.
Preparation of landscaping, kerb, guttering and drainage	• footpath and ramp construction and installation of new fencing • install boom gates, line marking, kerb and guttering, lighting, signage and landscaping.
Decommissioning of temporary facilities and site demobilisation	• site clean-up works, demobilisation of equipment and dissemble temporary fencing.

3.4.2 Plant and equipment

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

- 30-45 tonne excavator (with rock breaker attachments)
- 14 tonne excavators
- 5 tonne excavators
- 10 tonne articulated dump trucks
- 30 tonne truck and trailer
- D6 Dozer
- D4 skill steer loader

- Grader
- 12 tonne smooth drum roller
- 12 tonne pad foot roller
- forklift
- 120 tonne front end loader
- road sweeper
- water cart
- asphalt trucks
- concrete trucks
- generator
- bobcat
- hand tools
- mulcher
- chainsaw
- helicopter (smoothing out concrete)
- rattle gun
- lighting towers
- vibratory roller
- jack hammer
- grinder
- continuous flight auger rig
- small mobile crane
- hand-held soil compactor or wacker rammer
- nail gun
- paving machine
- coring machine
- grinder
- stump grinder
- elevated working platform
- scissor lift.

3.4.3 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:

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

As a result of COVID-19 standard construction hours have been extended to seven days per week, from 7am to 6pm. These modified construction hours would apply to the Proposal if they are still in place when construction is undertaken.

Certain works may need to occur outside standard hours and would include night works.

Out of hours works are required in some cases to minimise disruptions to customers, pedestrians, motorists and nearby sensitive receivers.

Approval from Transport for NSW would be required for any out of hours work and the affected community would be notified as outlined in Transport for NSW's *Construction Noise and Vibration Strategy* (TfNSW, 2019b) (refer to Section 6.3 for further details).

3.4.4 Extended Working Hours during COVID-19

The Minister for Planning and Public Spaces has made a number of Orders under Section 10.17 of the EP&A Act in response to the COVID-19 pandemic. This includes the *Environmental Planning and Assessment (COVID-19 Development – Infrastructure Construction Work Days No. 2) Order 2020* (the 'Order'), which commenced on 24 December 2020, and is applicable to construction activities for projects which have been subject to an assessment under Division 5.1, or approval under Division 5.2 of the EP&A Act.

The Order extends the standard construction hours to allow infrastructure construction work on Saturday, Sunday and Public holidays (7am to 6pm), without the need for any approval (excluding high noise generating works such as rock breaking or pile driving and the like). Whilst no further approvals are required for these extended working hours, in the event that Transport for NSW would seek to utilise the extended working hours permitted by the Order, advance notification would be provided to the community.

3.4.5 Earthworks

Excavations and earthworks would generally be required for the following:

- civil works, including drainage/stormwater works, and trenching activities
- bulk earthworks, including cutting of around 6,960 cubic metres and fill of around 2,770 cubic metres of material.

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

3.4.6 Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal, and would consider the requirements of the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2019a). Materials would be sourced from local suppliers where practicable. Reuse of existing and recycled materials would be undertaken where practicable.

3.4.7 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:

- Minor impacts to pedestrian and cyclist movements along Perry Street
- Increase in construction traffic for delivery of materials and removal of waste including excess earthworks material
- Temporary parking of construction workers' vehicles.

3.4.8 Ancillary facilities

A temporary construction compound would be required to accommodate a site office, amenities, laydown and storage area for materials. An area for a construction compound has been proposed within the Proposal boundary and may be relocated to different areas within the Site as construction activities progress (refer Figure 3-2). Impacts associated with utilising this area have been considered in the environmental impact assessment.

Ancillary works would be determined during detailed design and may comprise an upgrade of the existing pedestrian footpath along Perry Street and works to improve accessibility within the existing Barclay Road commuter car park. Any such works would involve minor earthworks and upgrades to footpath and kerb infrastructure. Impacts associated with any ancillary works have been considered in the environmental impact assessment.

3.4.9 Public utility adjustments

The Proposal has been designed to avoid relocation of services where feasible, however further investigation may be required. It is likely some services may require relocation, including aerial electrical wire and street lighting, but such relocation is unlikely to occur outside of the footprint of the works assessed in this REF. 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.

3.5 Property acquisition

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

3.6 Operation and maintenance

The future operation and maintenance of the car park is subject to further discussions with Transport for NSW and the City of Parramatta Council (the Council).

Figure 3-2 Proposal site and compound area

4 Statutory considerations

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

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

The (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.

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

4.1.2 Other Commonwealth legislation

Other Commonwealth legislation applicable to the Proposal is discussed in Table 4-1.

Table 4-1 Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	There is an obligation on a person who discovers anything which he or she has reasonable grounds to suspect are Aboriginal remains to report that discovery to the Minister, giving particulars of the remains and their location. The Proposal is not likely to include any previously identified Aboriginal remains, areas and/or objects (refer Section 6.4); however, considerations for unexpected finds are detailed in the mitigation measures.
Native Title Act 1993	The Commonwealth *Native Title Act* 1993 recognises the traditional rights and interests to land and waters of Aboriginal and Torres Strait Islander people. Under the *Native Title Act*, native title claimants can make an application to the Federal Court to have their native title recognised by Australian law. A native title investigation has been performed for the Proposal and indicate there are no native claims registered with respect to land within the area of the Proposal.
Disability Discrimination Act 1992 (DDA)	This Act aims to eliminate as far as possible, discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land. The Proposal would be designed having regard to the requirements of this Act. The key objective of the Proposal is to improve the accessibility of the M2 Barclay Road Bus Interchange through the provision of additional car parking which is consistent with the objectives of this Act.

4.2 NSW legislation and regulations

4.2.1 Transport Administration Act 1988

The *Transport Administration Act 1988* establishes Transport for NSW as a public authority who is to exercise its functions in a manner that promotes certain common objectives,

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

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

2A Objects of Act

…

a) to provide an efficient and accountable framework for the governance of the delivery of transport services,

b) to promote the integration of the transport system,

c) to enable effective planning and delivery of transport infrastructure and services,

d) to facilitate the mobilisation and prioritisation of key resources across the transport sector,

e) to co-ordinate the activities of those engaged in the delivery of transport services,

f) to maintain independent regulatory arrangements for securing the safety of transport services.

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

g) …Environmental sustainability

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

h) Social benefits

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

4.2.2 Environmental Planning and Assessment Act 1979

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

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

Clause 228 of the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has or is likely to have a significant impact on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with clause 228 and Appendix B specifically responds to the factors for consideration under clause 228.

4.2.3 Other NSW legislation and regulations

Table 4-2 provides a list of other relevant legislation applicable to the Proposal.

Table 4-2 Other legislation applicable to the Proposal

Applicable legislation	Considerations
Biodiversity Conservation Act 2016 (BC 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).
Biosecurity Act 2015 (NSW)	Section 22 requires any person who deals with a biosecurity matter, has a duty to ensure that in so far as is reasonably practicable, the potential biosecurity risk is prevented, eliminated or minimised. Appropriate management methods would be implemented during construction if declared noxious weeds in the City of Parramatta LGA are identified (refer to Section 6.7).
Contaminated Land Management Act 1997 (CLM Act) (NSW)	Section 60 of the CLM Act imposes a duty on landowners to notify the NSW Department of Planning, Industry and Environment (formerly 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).
Crown Lands Act 1987 (NSW)	The Proposal does not involve works on any Crown land.
Disability Discrimination Act 1992 (DDA Act) (Cwlth)	The Proposal would be designed having regard to the requirements of the DDA Act.
Heritage Act 1977 (Heritage Act) (NSW)	• 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. There are no heritage items listed on the State Heritage Register or government agency Heritage and Conservation Register on or in the vicinity of the Proposal site. Due to the highly disturbed nature and history of earthworks at the site, it is considered highly unlikely that any relics exist within the site. Refer to Sections 6.4 and 6.5 for further information regarding Indigenous heritage and non-Indigenous heritage as it pertains to the Proposal. No approvals or permits are required for the Proposal.
National Parks and Wildlife Act 1974 (NPW Act) (NSW)	Sections 86, 87 and 90 of the NPW Act require consent from NSW Department of Planning, Industry and Environment (formerly 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 within the vicinity of the find and appropriate advice sought.

Applicable legislation	Considerations
Protection of the Environment Operations Act 1997 (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, Transport for NSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the Contractor.
Roads Act 1993 (Roads Act) (NSW)	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads. The Proposal would not require road works adjacent to the Proposal site. Refer to Section 6.1.
Sydney Water Act 1994 (NSW)	The Proposal would not involve discharge of wastewater to the sewer.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW)	Transport for NSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared.
Water Management Act 2000 (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.

4.2.4 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

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

Division 17, Clause 94 of the Infrastructure SEPP allows for certain types of development to be carried out by or on behalf of a public authority without consent on any land (i.e. assessable under Division 5.1 of the EP&A Act). Specifically, Clause 94(1) of the Infrastructure SEPP states that:

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

Clause 93 defines 'road infrastructure facilities' as including elements such as:

> *'(a1) associated public transport facilities for roads used to convey passengers by means of regular bus services.'*

This element is further defined in Clause 5 to include:

> *'(2)(a) car parks intended for use by commuters'*

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

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

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

State Environmental Planning Policy 55 – Remediation of Land

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

Section 6.8 of this REF contains an assessment of the potential contamination impacts of the Proposal. It is not expected that any large-scale remediation (Category 1) work would be required as part of the Proposal.

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

4.2.5 Parramatta (former The Hills) Local Environmental Plan 2012

The Proposal is located within the City of Parramatta LGA. The Infrastructure SEPP prevails over all other environmental planning instruments (such as LEPs) except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018.* During the preparation of this REF, the provisions of *Parramatta (former The Hills) Local Environmental Plan 2012* were considered (refer Table 4-3).

Table 4-3 Relevant provisions of the Parramatta (former The Hills) LEP

Provision description	Relevance to the Proposal
Land Use Zones – Zone SP2 Infrastructure (Classified Road)	The Proposal is located in land zoned SP2 Infrastructure. The objectives of the zone include: • To provide for infrastructure and related uses. • To prevent development that is not compatible with or that may detract from the provision of infrastructure. The Proposal is consistent with the objectives of the SP2 Infrastructure zone as a commuter car park at the M2 Barclay Road Bus Interchange would support the public transport and associated infrastructure at the location by providing car parking for bus services at the interchange. The Proposal is permitted with consent under the LEP as the commuter car park is considered to be a development that is incidental to the classified road, as specified in the Land Zone Map (Figure 4-1).

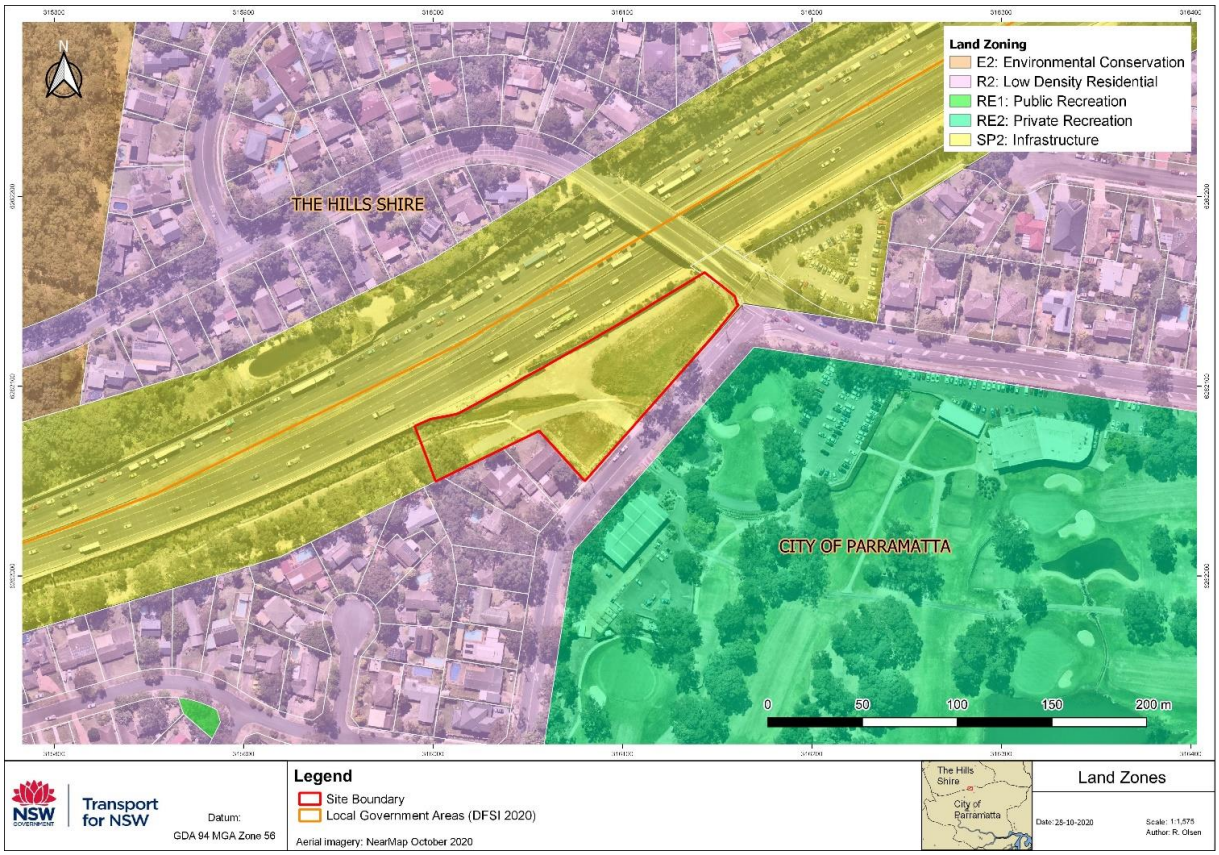

Figure 4-1 Parramatta (formerly The Hills) LEP 2012 zoning map

4.2.6 Draft Parramatta Local Environmental Plan

As a result of changes to Council boundaries in May 2016, the City of Parramatta currently operates under five separate LEPs. These represent the planning controls that were applying to different parts of the council area prior to the amalgamations. These include:

- *Auburn Local Environmental Plan 2010*, which applies to land in the former Auburn Council area
- *Holroyd Local Environmental Plan 2013*, which applies to land in the former Holroyd Council area
- *Hornsby Local Environmental Plan 2013*, which applies to land in the former Hornsby Council area
- *Parramatta (former The Hills) Local Environmental Plan 2012*, which applies to land in the former The Hills Council area
- *Parramatta Local Environmental Plan 2011*, which applies to land in the former Parramatta City Council area.

The Land Use Zone at the Proposal site is not expected to change from SP2 Infrastructure, as reflected in the *Planning Proposal – Consolidated Parramatta Local Environmental Plan* (City of Parramatta, 2020).

4.3 Ecologically sustainable development

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

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

The principles of ESD have been adopted by Transport for NSW throughout the development and assessment of the North Rocks Commuter Car Park. Section 3.3.3 summarises how ESD would be incorporated in the design development of the Proposal. Section 6.13 and 6.14 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 outlines the consultation strategy adopted for the Proposal including consultation undertaken to date and proposed for the future.

5.1 Stakeholder consultation during concept design

5.1.1 Previous consultation undertaken by the City of Parramatta Council

Transport for NSW has been consulting with City of Parramatta Council on commuter car parking options in the local government area to support customers using the M2 since 2016. In 2019, TfNSW presented Council with the concept plans for the proposed car park and sought initial Council feedback.

Through engagement with Council, Transport for NSW is aware of consultation that Council undertook in 2017 with nearby residents and property owners on the possible future use of the site as a commuter car park.

A survey of residents and property owners in the area was conducted by Council. A total of 155 responses were received from a potential total of 347 (282 owner occupiers, 34 tenants and 31 non-resident owners). The survey included questions regarding effects of existing commuter parking, revegetation of the site, and the use of the site as a car park.

Results of the consultation are summarised below:

- 66 per cent of residents experience parking or traffic issues from M2 bus commuters
- 70 per cent of respondents would prefer the site to be developed into a car park, while 30 per cent would prefer it to be revegetated
- benefits of a car park on the site would include removing cars from the streets and maintaining access to driveways
- concerns about the car park included crime/security and increased traffic to the area as a result of the car park
- key features that local residents indicated that they wanted if a car park was developed at the site included:
    - an increase in the regulations and enforcement of street parking
    - trees and vegetation to make the site more attractive and block its view from nearby houses
    - CCTV and fencing to control entry and prevent the site being an area used for groups of people congregating and performing stunts in their cars
    - effective traffic management systems with the car park's exit not opposite the Muirfield Golf Club driveway.

5.1.2 Consultation with The Hills M2 Motorway

Transport for NSW consulted with The Hills M2 Motorway (THML) on the preliminary design for comment on 21 September 2020. A response was made by THML on 2 October 2020 with a number of queries regarding a range of environmental factors, including noise impacts, hydrology impacts, spill prevention protocols, impacts to stormwater, and vehicle access paths.

During consultation, THML's primary concern was additional stormwater entering the M2 Motorway corridor as a direct result of the Proposal. Current design solutions, including the installation of an on-site stormwater detention tank, would prevent additional stormwater runoff entering the M2 Motorway corridor, as outlined in Section 6.9. Design solutions for the stormwater discharge are ongoing and would be further developed during detailed design and in consultation with THML and the City of Parramatta Council.

Transport for NSW would continue to consult with TMHL throughout the detailed design process.

5.2 Consultation requirements under the Infrastructure SEPP

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

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

Transport for NSW provided details of the Proposal to Council for comment as part of consultation under the Infrastructure SEPP in December 2020, with Council providing comments on 6 January 2021. A summary of these comments and Transport for NSW's responses are included in Table 5-2.

Table 5-1 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 | Consultation with Councils – development with impacts on council related infrastructure and services	Consultation is required where the Proposal would result in: • substantial impact on stormwater management services • generating traffic that would place a local road system under strain • involve connection to or impact on a council owned sewerage system • involve connection to and substantial use of council owned water supply • significantly disrupt pedestrian or vehicle movement • involve significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes works that would: • 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. Consultation with City of Parramatta Council has been undertaken and would continue throughout the detailed design and construction phases. Refer to Section 5.2.
Clause 14 | Consultation with Councils – development with impacts on local heritage	Where road infrastructure works: • substantially impact on local heritage item (if not also a State heritage item) • substantially impact on a heritage conservation area.	There is no proposed impact to local heritage/heritage conservation area. Accordingly, consultation with Council is not required. Refer to Section 6.5.

Clause	Clause particulars	Relevance to the Proposal
Clause 15 | Consultation with Councils – development with impacts on flood liable land	Where road infrastructure works: • impact on land that is susceptible to flooding – reference would be made to *Floodplain Development Manual: the management of flood liable land.*	The Proposal is not located on land that is susceptible to flooding. Accordingly, consultation with Council is not required in regard to this aspect. Refer to Section 6.9.
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	Where road infrastructure works: impact on land within a coastal vulnerability area and is inconsistent with certified coastal management program that applies to that land	The Proposal is not located within a coastal vulnerability area. Consultation with Council is not required in regard to this action.
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	Where road infrastructure works: impact on flood liable land - written notice must be given (together with a scope of works) to the State Emergency Services and taken into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given.	The Proposal is not located on flood prone land. Consultation with State Emergency Service is not required in regard to this action.
Clause 16 | Consultation with public authorities other than Councils	For *specified development* which includes consultation with the NSW Department of Planning, Industry and Environment (formerly OEH) for development that is undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974*. For *specified development* which includes consultation with the NSW Rural Fire Service for development for the purpose of a health facility, correctional centre or group home, or for residential purposes, in an area that is bushfire prone land.	The Proposal is not located adjacent to land reserved under the *National Parks and Wildlife Act 1974*. Accordingly, consultation with the NSW Department of Planning, Industry and Environment on this matter is not required. The Proposal is partly located in within a buffer zone of bushfire prone land, as discussed in Section 6.12, however the Proposal is not for the purpose of a health facility, correctional centre or group home, or for residential purposes, therefore consultation with the NSW Rural Fire Service on this matter is not required.
Clause 104 | Consultation with (former) RMS (now part of TfNSW) regarding traffic generating development	For *traffic-generating development* specified in Column 1 of the Table to Schedule 3 that involves new premises of the relevant size or capacity, or an enlargement or extension of existing premises, being an alteration or addition of the relevant size or capacity – written notice of the intention to carry out the development must be given to the relevant roads authority in relation to the development. Any response to the notice that is received from the relevant roads authority within 21 days after the notice is given must be taken into consideration.	The Proposal is not deemed a traffic-generating development the proposed is not a car park with over 200 car parking spaces. Accordingly, consultation is not required in regard to this aspect.

Table 5-2 Council feedback themes

Key themes of feedback	Response
Design of the car park must ensure that all traffic queues are able to be contained within the car park and that they do not extend onto the public road.	The Traffic, Transport and Access Impact Assessment indicates that the traffic queues are able to be contained within the car park based on forecasted trip rates for inbound and outbound trips. This will also be re-confirmed during detailed design. Automatically opening entry boom gates are expected to minimise the potential for queueing on Perry Street. An Opal card is only required for exiting the car park.
Modelling should be undertaken to ensure that the impact to the community and existing traffic is minimised.	Modelling has been undertaken in the Traffic, Transport and Access Impact Assessment which confirms that additional traffic generated by the operation of the Proposal would not be expected to compromise the safety or function of the surrounding road network. The potential traffic and access impacts of the Proposal are assessed in Section 6.1. Detailed design would further assess traffic impacts at the Barclay Road/Perry Street intersection, initial analysis indicates the proposed commuter car park is not expected to worsen the existing conditions. Further consultation would occur with Council during detailed design.
The car park (including gradients within parking modules) must be designed to be complaint with AS 2890.1:2004 off-street parking.	The design of the car park will comply with AS 2890.1:2004.
The travel lanes should be redesigned to prioritise parking where the majority of spaces occur.	The design of travel lanes would be considered during the detailed design process. Travel lane dimensions are designed in accordance with Australia Standards.
Excessive use of hardscape significantly increases heat load, reduces opportunity for on-site landscape and canopy tree planting and stormwater recharge which can ultimately translate into an inhospitable and unattractive asset that could deter patronage.	An Urban Design and Landscape Plan would be prepared for the Proposal prior to the finalisation of detailed design for endorsement by Transport for NSW. Council would be consulted on the Urban Design Plan during detailed design.
Site perimeter fencing should be porous and low scale, not security fencing.	The design of site perimeter fencing would be considered during the detailed design process. Council's comments would be provided to the Contractor for consideration in the design.
A number of public domain revisions to the concept design are outlined by Council along with drawings to be prepared during detailed design.	Council's requests would be provided to the Contractor for consideration as part of the detailed design of the car park. Consultation on public domain requirements would continue with Council throughout the detailed design and construction phases, including

Key themes of feedback	Response
	kerb and guttering and vehicle crossing at the entry/exit.
A concept stormwater management plan be prepared indicating all proposed stormwater collection and legal disposal into Council's infrastructure. The concept plans shall indicate how flood levels are to be addressed.	Stormwater management system would be prepared during detailed design and consider Council's engineering requirements. Written approval would be sought from Council during detailed design to connect to the Council's drainage system.
A Survey Plan including all trees > 5 metres in height on and adjacent to the site should be undertaken.	A detailed site survey, including trees, would be prepared during detailed design.
A Landscape Plan prepared by a qualified Landscape Architect should be prepared and adhered to as part of the proposal.	An Urban Design and Landscape Plan would be prepared for the Proposal prior to the finalisation of detailed design for endorsement by Transport for NSW. The Urban Design and Landscape Plan would be prepared in consultation with Council.
An Arboricultural Impact Assessment Report & Tree Protection Plan for trees to be retained and removed should be prepared final design is approved.	Separate to this REF, an Arboricultural Impact Assessment has been prepared to identify existing trees within the Proposal site and Ancillary Works Areas. The report includes details of tree protection for trees that are to be retained. The extent of tree removal would be confirmed during detailed design.

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 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
- utilise community feedback to inform the detailed design of the project
- build positive relationships with identified community stakeholders
- ensure a comprehensive and transparent approach.

5.4 Targeted Consultation

Targeted consultation activities for the Proposal were undertaken from Friday 4 December to Friday 18 December 2020.

In response to the evolving COVID-19 situation, Transport for NSW followed NSW Health advice and changed the approach to community consultation.

Acknowledging the importance for the community to have their say on all transport infrastructure projects, Transport for NSW is ensured appropriate community consultation was carried out whilst maintaining a COVID-19 safe approach.

Targeted community consultation adopted a range of online and non-face-to-face consultation mechanisms to ensure social distancing was practiced to limit the spread of Coronavirus, including:

- targeted consultation with local businesses and other community groups through phone calls and emails
- a community notification distributed to local residents and businesses via letterbox drop
- consultation with key stakeholders such as the City of Parramatta Council and adjacent land holders via phone calls and online meetings
- geographically targeted social media advertising via Facebook to inform the community of the Proposal and invite their feedback online
- development of a dedicated web page and online feedback form for the project on the Transport for NSW website, which can be found at www.transport.nsw.gov.au/NorthRocks.

The feedback received from the community regarding the Proposal during the consultation process has been categorised into the key themes in Table 5-3.

Table 5-3 Community feedback themes

Key themes of feedback	Response
Supportive of the Project	Improving commuter parking at the M2 North Rocks Bus Interchange is a priority for Transport for NSW. Construction of the at-grade car park is planned to begin mid-2021 and take around 12 months to complete.
Concern that 135 car space will not cater for current or future demand and requests for a multi-storey car park instead of the proposed at-grade design.	Transport for NSW is aware that customers in the North Rocks area have been calling for more commuter car parking. The City of Parramatta LGA is one of the fastest growing regions in Sydney. Experiencing substantial growth, its population is expected to grow to around 438,000 people over the next 20 years. The development of a new at-grade commuter car park at North Rocks would assist in addressing the existing parking shortage in the immediate vicinity of the M2 Barclay Road Bus Interchange and increase commuter connectivity to the greater Sydney area. The proposed North Rocks Commuter Car Park would be built using a flexible and adaptable design that

Key themes of feedback	Response
	would allow for future opportunity to increase capacity if required. Transport for NSW is planning for future growth in Greater Parramatta through a range of integrated road and public transport improvements identified as part of *Future Transport 2056*. Transport for NSW would continue to monitor demand in the region and consider further transport initiatives such as active transport links and bus and on-demand transport services to provide customers with more choice in how they travel to the bus interchange.
Concerns over traffic along Perry Street and Barclay Road and request for upgrades/changes to traffic lights to accommodate the additional cars	A Traffic, Transport and Access Impact Assessment (TTAIA) was undertaken and found that the Proposal could generate up to 40 in and 34 out vehicle trips in the weekday morning (7:30am-8:30am) and afternoon (5:30-6:30pm) peak hour periods, respectively. These trips are based on trip generation rates of 0.31 (in) and 0.26 (out) trips per space, respectively. The new car park would minimise the need for commuters to find on-street parking along Perry Street. Further, the assessment found that the Barclay Road and Perry Street intersection is expected to retain similar operation to existing conditions, with only a minor increase in delay time, and that the additional traffic generated by the operation of the Proposal would not be expected to compromise the safety or function of the surrounding road network. The potential traffic and access impacts of the Proposal are assessed in Section 6.1.
Request for bicycle facilities	Existing secure bicycle facilities are located within the Barclay Road commuter car park. The secure bike facilities are provided by third parties and their usage is not monitored by Transport for NSW. There are currently 3 bike hoops provided in the Barclay Road commuter car park. Anecdotally they have had low usage recently, however since 2016 the nearby bicycle route has been detoured due to the construction of NorthConnex. It is expected demand would increase with the recent opening of NorthConnex, therefore Transport for NSW are proposing to install an additional 5 bicycle hoops as part of the project, their location will be considered during detailed design of the car park.
Request for upgrade to Perry Street and for entry/exit to align with golf course driveway	Previous consultation undertaken by the City of Parramatta Council, as detailed in Section 5.1.1, indicated that stakeholders would prefer that the entry and exit points to the car park were not located directly opposite the entry and exit points to the Muirfield Golf Club car park.

Key themes of feedback	Response
	This option was reviewed in design and was considered to be unfeasible given that the longitudinal gradient of Perry Street increases to around 10 per cent north of the proposed driveway location. Assessment undertaken for the Proposal found that having the car park access located directly opposite the Muirfield Golf Club car park would essentially create a four-way intersection. This is considered appropriate as movement priorities would be clear and there would be sufficient separation from the Barclay Road intersection.
Request for parking restrictions on local streets	Transport for NSW will refer this request to City of Parramatta Council for consideration during detailed design.
Enquiry regarding Park&Ride and if the parking will be free	The concept design for the at-grade car park includes 'Transport Park&Ride' facilities, which means commuters can park for free for up to 18 hours when they tap on to connecting public transport journeys with their Opal card. Charges would apply after 18 hours. These arrangements are in place to discourage long term parking and maximises availability of spaces for commuters using public transport.
Request for more landscaping and concerns over the heat island effect	An Urban Design and Landscape Plan would be prepared during the detailed design. The Plan would include materials and landscaping, that would be selected on the basis of sustainability principles to assist with the reduction of the urban heat island effect. The detailed design process would seek to retain existing vegetation where possible, however where this cannot be achieved, any vegetation removed would be offset as per the TfNSW Vegetation Offset Guide. The detailed design would consider the impacts of climate change on the Proposal through the selection of materials for durability in extreme conditions and that minimise heat retention. Additional information on the potential impacts of climate change on the Proposal are given in Section 6.14.
Safety concerns for people crossing Barclay Road against the lights	The additional traffic generated by the operation of the Proposal would not be expected to compromise the safety or function of the surrounding road network including the operation of the Barclay Road intersection. Nevertheless, further traffic assessments would be undertaken during detailed design to ensure safe passage for pedestrians around the commuter car park.

Key themes of feedback	Response
Concerns over potential air quality and noise impacts to residents between 1 - 3 Perry Street	A Noise and Vibration Impact Assessment (NVIA) was undertaken for the Proposal. The potential impacts and mitigation measures for noise and vibration impacts are given in Section 6.3. Noise impacts are anticipated for nearby receivers during construction, however these would be managed by applying reasonable and feasible mitigations. During construction, air quality impacts on adjacent properties would be associated with the generation of dust and emissions from stationary and moving on-site machinery and associated vehicular traffic. The overall impacts of air quality during the operation of the Proposal are considered to be minimal (refer to Section 6.10 for further details, including the proposed air quality mitigation measures).
Request for provision of toilets in the car park	Toilets are not provided as a standard item of scope for commuter car parks, and are similarly not proposed for the North Rocks Commuter Car Park.
Request for provision of motorcycle spaces	This request would be considered as part of the detailed design process of the car park.
Request for lift or stair access on the car park side of the M2 Motorway	The provision of a lift or stair access does not form part of the current Proposal scope of works.
Request for car park to include public open space	The primary purpose of the Proposal is to provide additional car parking space to reduce the current excess demand. The provision of open space within the site would therefore inhibit this objective. Accordingly, the provision of open space within the car park is not proposed.
Request for pedestrian access to fire trail from car park	The provision of pedestrian access to the fire trail does not form part of the current Proposal scope of works.
Request for additional public transport services	Transport for NSW is planning for future growth in Greater Parramatta through a range of integrated road and public transport improvements identified as part of *Future Transport 2056*. Transport for NSW would also continue to monitor demand in the region and consider further transport initiatives as required.

Following consideration of feedback received, Transport for NSW would determine whether to proceed with the Proposal and what conditions would be imposed on the project 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 (the area around Lat, Long: -33.766, 151.0127 to Lat, Long: -33.7642, 151.0155) plus a 200 metre radius, on 6 October 2020. One Aboriginal site was

recorded within the search area. It is confirmed from AHIMS that this recorded site is not located within Lot 170 DP 1151136.

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. Indigenous cultural heritage is discussed further in Section 6.4.

5.6 Ongoing consultation

At the conclusion of the consultation period Transport for NSW acknowledged receipt of feedback from each respondent. The issues raised by the respondents have been considered by Transport for NSW before determining to proceed with the Proposal (refer Figure , page 12).

This document will be made available on the Transport for NSW website and respondents who provided feedback will be notified that feedback received during the consultation period has been considered and addressed, including a summary of mitigation measures proposed to minimise the impacts of the Proposal.

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

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 (TTAIA) was undertaken by GTA Consultants in November 2020 for the Proposal (GTA Consultants, 2020). The results of the TTAIA are summarised below.

6.1.1 Existing environment

The surrounding properties are predominantly residential along with a golf course and schools further east. North Rocks Shopping Centre is located 1.2 kilometres east of the site. An existing commuter car park exists on the other side of Barclay Road, with 89 parking spaces including three accessible spaces.

Existing road network

The existing road network in the vicinity of the site includes the M2 Hills Motorway, Renown Road, Barclay Road, North Rocks Road and Perry Street. Below is a review of the network.

M2 Hills Motorway

The M2 Hills Motorway is classified as an Arterial (State) Road. It is an east-west connector between Winston Hills and turns into the Lane Cove Tunnel and Warringah Freeway towards Sydney CBD. The speed limit is 100 kilometres per hour near the site and has a six-lane, two-way configuration. There is a dedicated bus lane on each side of the motorway and the median contains a bus interchange.

Renown Road, Barclay Road and North Rocks Road

Renown Road, Barclay Road and North Rocks Road are all classified as sub-arterial (regional) roads, and act as east-west connectors between Baulkham Hills and Carlingford. The speed limits are 60 kilometres per hour near the site. Each road has a three-lane, two-way configuration and are each 12.5 metres wide with a 20 metre road reserve. Kerbside parking is not permitted near the site.

Perry Street

Perry Street is classified as a local road with a north-south orientation from Barclay Road for around 700 metres to a cul-de-sac. The speed limit along the road is 50 kilometres per hour with a two-lane, two-way configuration. Unrestricted kerbside parking is permitted along Perry Street.

Traffic volumes

GTA Consultants commissioned vehicle turning movement counts at the Barclay Road and Perry Street signalised intersection, which also provides access to the existing Barclay Road Commuter Car Park, on Tuesday 13 October 2020 during the following peak periods:

- 7.00 am and 8.30 am

- 5.00 pm and 6.30 pm.

Data from the vehicle turning movement counts are summarised in Table 6-1 below, alongside Sydney Coordinated Adaptive Traffic System (SCATS) data for 16 October 2019 of the same intersection, to account for any effects of the COVID-19 pandemic.

Table 6-1 Existing weekday AM/PM peak hour traffic volumes(Source: GTA Consultants, 2020).

Source	Time period	Perry Street total	Barclay Road east total	Existing commuter car park total	Barclay Road west total	Grand total
October 2019	7.30 am – 8.30am	102	731	43	1,253	2,349
October 2020	7.30 am – 8.30am	94	822	39	1,190	2,145
October 2019	5.00pm – 6 pm	106	1,177	42	763	2088
October 2020	5.00pm – 6 pm	74	1,163	36	591	1864

The difference in volumes have been outlined below in Table 6-2. This comparison suggested a reduction of around 10 per cent of total volume in 2020 compared to 2019 conditions, which can be attributed to the COVID-19 pandemic. The turning movement split and vehicle use class splits observed at the 2019 traffic counts are expected to be mostly representative of normal operating conditions.

Table 6-2 Existing traffic volume comparison 2019-2020 (Source: GTA Consultants, 2020).

Time period	Perry Street	Barclay Road east	Existing commuter car park	Barclay Road west	Total
7.30am – 8.30am	102%	89%	110%	105%	110%
5.00pm – 6pm	143%	101%	129%	129%	108%

Intersection operation

The intersection operation was assessed using SIDRA INTERSECTION (SIDRA), a computer-based modelling package which calculates intersection operation. The assessment focussed on vehicle delay which is a commonly used measure of intersection operation. The average delay that vehicles encounter provides a measure of the level of service (LOS). Table 6-3 shows the existing operation of the intersection. LOS range from good operation (LOS A) to extreme delay (LOS F). The modelling used by GTA Consultants was based on 2019 SCATS volumes provided by Transport for NSW, with the recent traffic surveys used to determine directional split. This ensures the analysis best reflects baseline ‘business as usual’ conditions prior to COVID-19.

Table 6-3 Existing operating condition (Source: GTA Consultants, 2020).

Peak	Leg	Degree of saturation (DoS)	Average delay (seconds)	95th percentile queue (m)	Level of Service (LOS)
AM	Barclay Road east	0.69	10	150	A
	Car Park Access	0.40	52	16	D
	Barclay Road west	0.43	8	88	A
	Perry Street	0.37	54	19	D
	Overall	0.67	12	150	A
PM	Barclay Road east	0.82	10	288	A
	Car Park Access	0.50	61	20	E
	Barclay Road west	0.23	6	40	A
	Perry Street	0.59	67	24	E
	Overall	0.82	13	288	A

Table 6-3 indicates that the signalised intersection of Barclay Road and Perry Street currently operates satisfactorily. Given the high volume of traffic along Barclay Road, the traffic signals provide the majority of the green time to these through movements to manage queuing. This is evident by the longer delays for Perry Street and the existing commuter car park, although queues are only two to three vehicles.

Existing car parking

During a site inspection undertaken by GTA Consultants on the 13 October 2020, an inventory of publicly available on-street and off-street parking was compiled. The inventory identified a total of 55 on-street spaces (including 48 spaces that are unrestricted during the day) and 89 off-street car parking spaces (including three accessible spaces) within the surveyed area. The car parking survey breakdown is given below in Table 6-4.

Table 6-4 Nearby car parking supply (Source: GTA Consulting, 2020)

Location	On/off street	Time restrictions	Supply
Barclay Road Commuter Car Park	Off street	Unrestricted	89 (3 accessible)
Perry Street	On street	Unrestricted	14
Barclay Road	On Street	No parking	0

Location	On/off street	Time restrictions	Supply
Mill Drive	On Street	Unrestricted	24
Carlton Drive	On street	4P	7
	On street	Unrestricted	10
Total			**144**

Parking demand spot checks were compiled by GTA Consulting during the AM peak on 13 October 2020. The results indicated that on-street car parking demands in the nominated area are relatively high by 8.30am, with peak demands of 56 per cent (21 spaces vacant) for unrestricted kerbside parking and 42 per cent (4 spaces vacant) for the 4-hour kerbside parking. The existing commuter car park is essentially full by 8.30am (three spaces vacant). It is noted that the above results represent a lower rate of overflow car parking compared to observations made before the COVID-19 pandemic by FutureRail (2020b), which was based on a wider survey area using site observations and aerial photography.

Public transport

The Proposal would service the M2 Barclay Road Bus Interchange. Services depart from the interchange every 5 to 10 minutes in the morning and afternoon peak period, every 15 to 30 minutes in the inter-peak period, and every 30 minutes to 1 hour in off peak times. Travel time from the interchange to the Sydney CBD is around 32 minutes, and travel time to the Parramatta CBD is around 32 minutes. The interchange comprises two platforms on an island platform, with buses operating either side.

Walking and cycling infrastructure

Pedestrian paths are located on the western side of Perry Street provides access to Barclay Road, and on both sides of Barclay Road, providing access to the M2 Barclay Road Bus Interchange.

The Barclay Road and Perry Street intersection is signalised with pedestrian crossing on three of the four legs (excludes the eastern leg).

Bicycle lockers are provided in the existing Barclay Road commuter car park for 10 bicycles.

6.1.2 Potential impacts

a) Construction phase

Construction traffic

Construction of the Proposal would require additional vehicle movements associated with the delivery of materials and transport of workers.

It is anticipated that there would be up to 40 construction workers on-site at peak construction, for a period of around 3 weeks, and an average of 18 workers on-site at other times. No parking for construction workers would be provided on-site. Workers that drive would be instructed to avoid parking in the existing commuter car park or on-street near the bus interchange to prioritise local commuters. Workers would also be advised to use public transport where possible, with appropriate tool and equipment drop-off arrangements provided on-site. Given the works would generally occur within standard working hours, workers would tend to arrive and depart the site outside of the road network peak hours.

Construction vehicles including heavy vehicles would enter and exit the site via the driveway on Perry Street. It is anticipated that all loading and unloading activities can be contained

wholly within the site, however upgrades to the driveway, external footpaths and layback would require on-street work zones.

It is anticipated that the construction works would generate two to ten trucks per hour across the construction program and 30 to 50 truck movements daily during peak activities (a 6 to 8 week period). These anticipated construction traffic volumes would be able to be appropriately accommodated within existing traffic volumes on the surrounding road network.

Access to the Barclay Road commuter car park would be maintained during the construction of ancillary works. Pedestrian access along Perry Street would be managed to ensure that safe pedestrian access is maintained within the area.

Pedestrian and cyclist management

The construction activities are expected to have minimal impact on pedestrian and cyclist movements in the vicinity of the site, as Perry Street acts as a cul-de-sac environment. Site access would be managed and controlled by accredited traffic controllers, which would aim to prioritise pedestrian, cyclists and general traffic over construction vehicles, where practical.

b) Operational phase

Sight line assessment

A review of available sight lines at the Proposal site was completed by GTA Consultants during a site visit on 13 October 2020 which reviewed the visibility of the road from a minor road approach or driveway at drivers' level. The available sight line illustrated that there are no obstructions toward the traffic signals and at least 75 metres towards the south, which meets the desirable distance set out in the Australian Standard/New Zealand Standard, *Parking Facilities – Part 1: Off-street car parking* (AS/NZS2890.1:2004).

Traffic generation

Estimates of traffic generation as a result of the Proposal were calculated with reference to the existing commuter car park and its peak hour vehicle movements. It is considered that the existing car park is mostly reflective of the expected demand for the proposed car park, being that it is in close proximity to the Proposal. The main differences between the operation of the two car parks would be that the existing car park is likely to have peak traffic generation earlier than the proposed car park in the morning as commuters would fill it up first, being closer to the interchange, and the existing car park would continue to be primarily used for drop off and pick up activities.

Based on existing morning and afternoon peak rates of vehicle trips generated by the existing commuter car park, the following estimates of peak hour traffic volumes as a result of the Proposal are set out in Table 6-5 below. Table 6-5 indicates that the site could potentially generate up to 40 and 34 vehicle trips in the weekday morning and afternoon peak periods, respectively.

Table 6-5 Traffic generation estimates for Proposal (Source: GTA Consultants, 2020).

Use	Spaces	AM			PM		
		In	Out	Total	In	Out	Total
Car park	135	40	-	**40**	-	34	**34**

Distribution of traffic

Directional distribution of arrivals and departures from the existing car park is considered to be representative of conditions expected for the Proposal. Using assessment of the directional distributions of the existing car park, the estimated directional generation of the Proposal is given in Table 6-6 below, and illustrated in Figure 6-1.

Table 6-6 Directional generation estimates (Source: GTA Consultants, 2020).

Time period	Leg	Direction	Volume
AM	Barclay Road west	Left turn into Perry Street	28
	Barclay Road east	Right turn into Perry Street	12
PM	Perry Street	Left turn into Barclay Road east	11
		Right turn into Barclay Road west	23

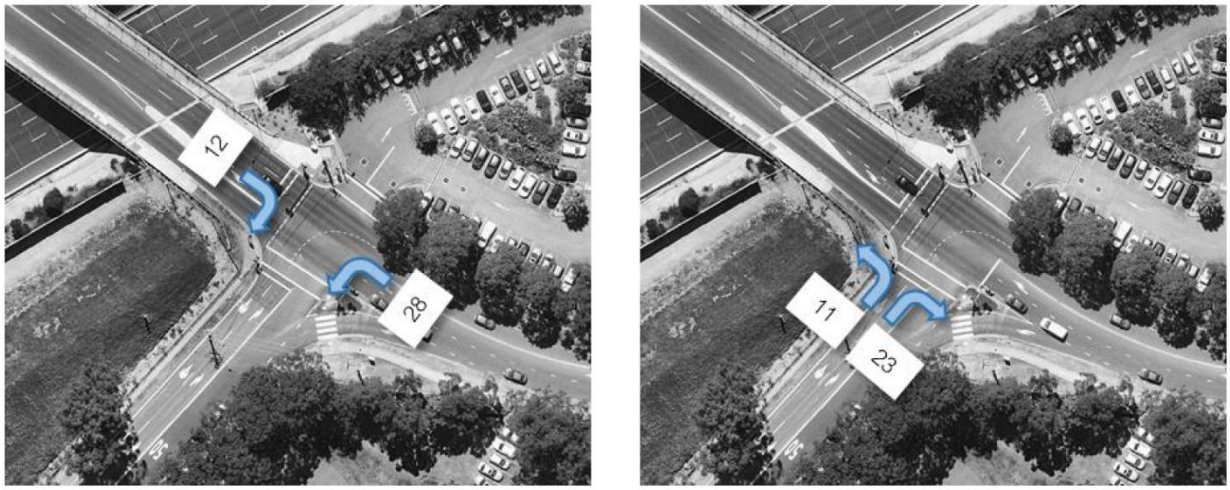

Figure 6-1 Proposed directional generation AM (left) and PM (right) (Source: GTA Consultants, 2020).

Traffic impact

The expected impact of the additional traffic generated by the Proposal has been assessed using SIDRA. Table 6-7 summarises the anticipated future intersection operation. The intersection is expected to retain similar operation to existing conditions, with only a minor increase in delay time. Results of the SIDRA assessment of operating conditions given in Table 6-7 indicates that the additional traffic generated by the operation of the Proposal would not be expected to compromise the safety or function of the surrounding road network. This analysis is based on background traffic volumes prior to COVID-19 to best reflect baseline 'business as usual' traffic conditions at the site.

Table 6-7 Proposed operation conditions (Source: GTA Consulting, 2020).

Peak	Leg	Existing Level of Service (LOS)	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of Service (LOS)
AM	Barclay Rd East	A	0.72	10	151	A

Peak	Leg	Existing Level of Service (LOS)	Degree of saturation (DOS)	Average delay (sec)	95th percentile queue (m)	Level of Service (LOS)
	Car park access	D	0.47	53	19	D
	Barclay Rd West	A	0.51	9	110	A
	Perry Street	D	0.37	54	19	D
	Overall	A	0.72	12	151	A
PM	Barclay Rd East	A	0.82	10	285	A
	Car park access	E	0.39	61	15	E
	Barclay Rd West	A	0.23	6	39	A
	Perry Street	E	0.60	67	24	E
	Overall	A	0.82	13	285	A

Access

The Muirfield Golf Club had previously expressed to the Council that the new entry and exit point to the Proposal should be located approximately 30 metres north of the existing golf club driveway access. This option was reviewed in design and was considered to be unfeasible given that the longitudinal gradient of Perry Street increases to around 10 per cent north of the proposed driveway location. This would present a safety issue for turning vehicles.

Additionally, there is also a pad-mounted transformer in that approximate location. Assessment undertaken within the TTAIA found that having the car park access located directly opposite the Muirfield Golf Club car park would essentially create a four-way intersection. This is considered appropriate as movement priorities would be clear and there would be sufficient separation from the Barclay Road intersection.

6.1.3 Mitigation measures

A Construction Traffic and Pedestrian Management Plan (CTPMP) would be prepared prior to commencement of construction to address the potential impacts identified in the REF and the TTAIA.

Wherever possible, deliveries would be scheduled outside peak commuter periods.

Should it be required, any additional construction worker parking (in exceed of what would fit in the construction compound) is not to impact on existing commuter parking in the surrounding area. Construction personnel would be encouraged to use public transport to access the site, where possible.

Refer to Table 7-1 in Section 7.2 for the proposed mitigation measures with respect to potential traffic impacts.

6.2 Urban design, landscape and visual amenity

A Landscape Character and Visual Impact Assessment (LCVIA) was undertaken by Clouston Associates in November 2020 for the Proposal (Clouston Associates, 2020). The results of the LCVIA are summarised below.

6.2.1 Existing environment

A site visit was undertaken by Clouston Associates in October 2020 to gain an understanding of the existing visual environmental within the Proposal area and surrounds. Photographs taken during the site visit are included in the LCVIA (Clouston Associates, 2020).

Landscape character

The surrounding housing land is zoned R2 – Low Density Residential and is characterised by quiet streets with a mixture of single and double storey dwellings constructed of various materials and styles. Directly east of the site is Muirfield Golf Club which provides a significant open space recreation area for its members. Located around 180 metres north-west of the site is Bidjigal Reserve, a publicly accessible nature reserve, comprising a number of bushwalking tracks, providing an important recreational opportunity for both residents in the immediate area as well as bush walkers from the wider Sydney area.

North Rocks Shopping Centre is located 1.2 kilometres east of the site on North Rocks Road and consists of standard shopping centre stores. A light industrial area is located to the south of the site, which includes various industrial estates.

The M2 Hills Motorway runs along the boundary of the site and forms a significant feature of the surrounding area. Pedestrian access to the M2 Barclay Road Bus Interchange is provided from Barclay Road Bridge. The existing Barclay Road commuter car park is located to the north-east of the Proposal site, which services the bus interchange.

Visual receivers

Existing visual catchment

A desktop topography study was undertaken by Clouston Associates (2020) to understand the existing nearby visual catchment of the Proposal. The study did not take into account vegetation or building heights. The nearest existing sensitive viewpoints are residences located along Perry Street, as depicted in Figure 6-2. Viewpoint locations have been selected based on their potential impact by the Proposal, these are given in Figure 6-3.

The visual catchment of the Proposal is highly limited and is generally restricted to the immediate area surrounding the Proposal.

Figure 6-2 Surrounding viewshed (Source: Clouston Associates, 2020).

Figure 6-3 Viewpoint locations (Clouston Associates, 2020).

6.2.2 Potential impacts

a) Construction phase

Temporary works associated with construction of the Proposal would include the use of plant and equipment, establishment of the site compound area, site fencing, clearing of vegetation and stockpiling of materials. These changes would be temporary and therefore would not result in a long term visual impact on the existing or future landscape character. During construction, many viewpoints within the vicinity of the Proposal are likely to have increased visual impacts. View of site compounds, storage areas and increased site traffic would lead to

a reduction in visual amenity. Impacts would reduce as viewing distance and screening vegetation increase.

b) Operational phase

The Proposal would be a recognisable new element within the landscape. The viewpoints have been assessed in accordance with the *Guideline for Landscape Character and Visual Assessment, Environmental Impact Assessment Practice Note EIA-N04* (RMS, 2018). The method to measure impact is based on the combination of sensitivity of the existing view to change, and magnitude of change the Proposal would have on that area or view. Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to the proposed nature of change. Magnitude refers to the physical scale of a project, how distant it is, and the contrast it presents to the existing condition.

A visual impact assessment has been undertaken by Clouston Associates (2020), and the summary of findings of the assessment for each viewpoint shown in Figure 6-3 is given in Table 6-8 below.

References to rows in Table 6-8 refer to the car park row layout given in Figure 6-4 and Figure 6-5 below.

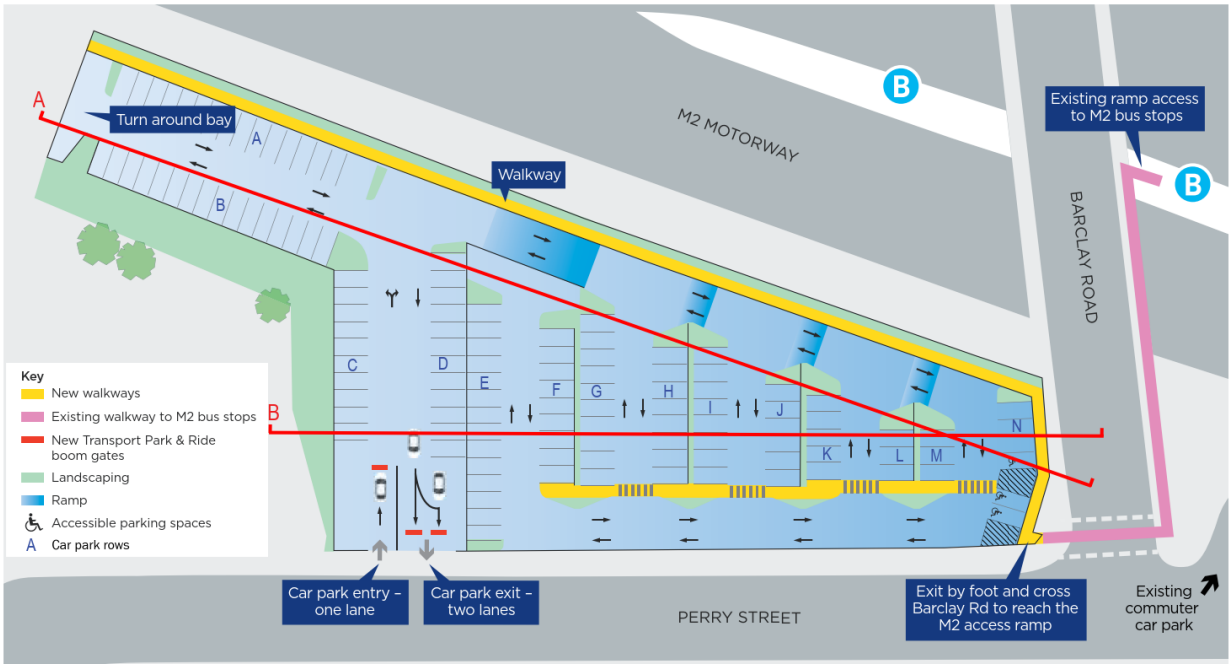

Figure 6-4 Concept design (subject to planning approval and detailed design).

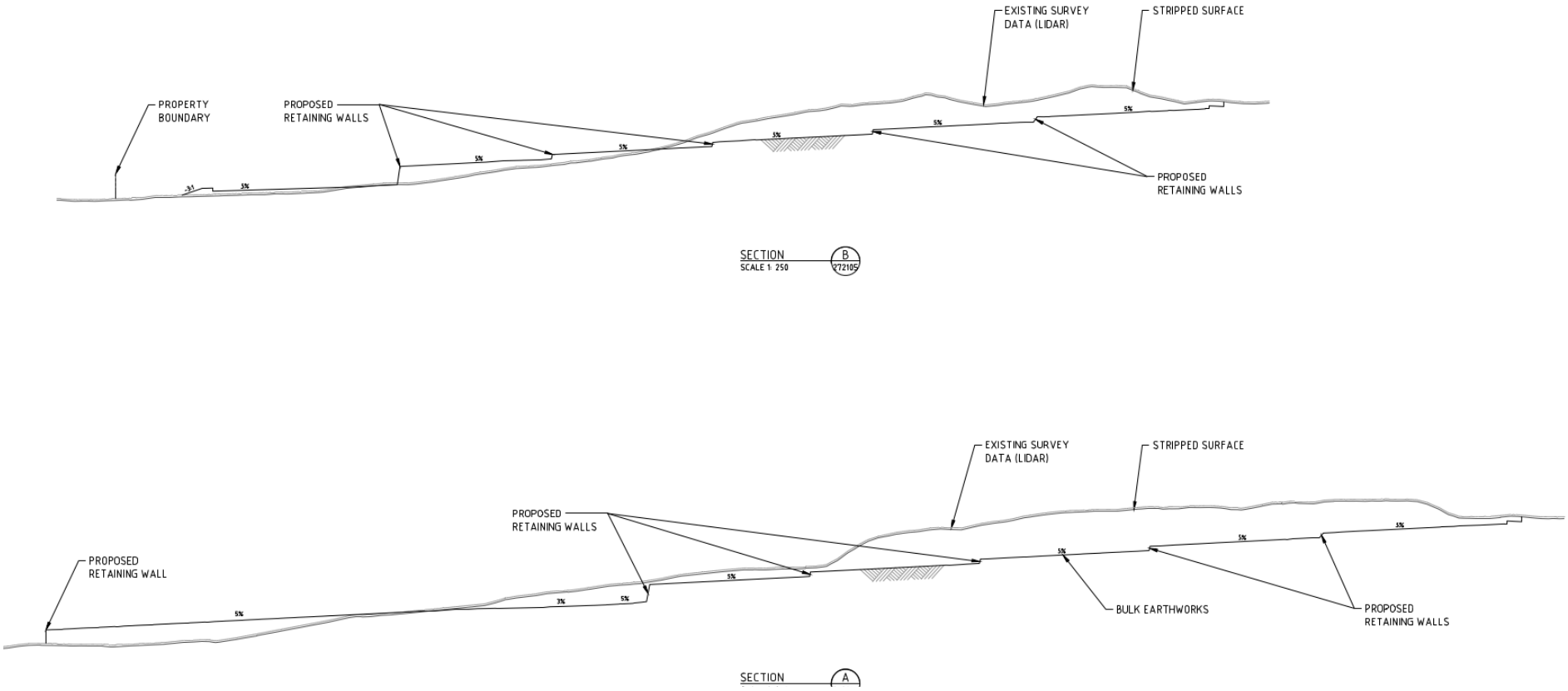

Figure 6-5 Existing and proposed sections (subject to detailed design).

Table 6-8 Summary of visual impacts on viewpoints (VP) (Source: Clouston Associates, 2020).

Viewpoint	Description of existing view	Visual sensitivity	Magnitude of change	Visual impact	Overall impact
V1 – Driveway of 7 Perry Street	A number of trees of varying species and heights forms a dominant element within the visual scene. A near continuous band of canopy obscures the majority of the site, with only a small portion of gravel visible to the left of the view as well as a highly framed view of a fraction of the grassed mound. Residential dwellings of number 1 and 3 Perry Street that border the southern boundary of the site are visible to the left of the view, with a pedestrian pathway running parallel to this. Perry Street can be seen to the right of the view with a number of parked cars visible.	Low	Low	Much of the Proposal would remain obscured as a result of existing vegetation outside of the site boundary. To the left of the view where gravel can currently be seen it is anticipated that the proposed landscaping on the 3 in 1 batter along the boundary of 1 Perry Street would obstruct views into the site and increase the level of perceived vegetation significantly which would contribute positively to the visual scene. The most noticeable change would be the removal of the grassed mound that is visible to the right of the view. This would result in a small, highly framed view to Barclay Road in the distance, with only a fraction of the northern portion of the Proposal visible. Proposed landscaping islands in this area would and an additional amount of vegetation to the view, however given the distance, the perception of this would be limited.	Low
V2 - Opposite 1 Perry Street	The foreground of the view is comprised of Perry Street, which recedes into the distance to connect with Barclay Road. Chain wire fencing can be seen running parallel to the street. The significant grassed mound can be seen beyond this, as can the line	Low	Moderate	The most noticeable change to the visual scene would be the removal of the grassed mound to the right of the view. This would result in views of the proposed parking bays and vegetated islands throughout the site, as well as more long distant views towards Barclay Road becoming possible. The level of existing vegetation to the right	Moderate/Low

Viewpoint	Description of existing view	Visual sensitivity	Magnitude of change	Visual impact	Overall impact
	of eucalyptus trees on site. The grassed mound obstructs long distance views to the Barclay Road bridge over the M2 Hills Motorway. Two small trees to the centre and centre-left (outside of the site) obstruct the central area of the site. To the left of these trees can be seen a small portion of the gravel road on site as well as the noise wall that runs along the site boundary parallel to the M2 Hills Motorway.			of the view would decrease as a result of the removal of the existing mature eucalyptus trees on site that run parallel to Perry Street. Proposed landscaping and screening trees to the 3 in 1 batter that runs parallel to 1 Perry Street would add a noticeable new level of vegetation to the visual scene, and would highly filter views into the site to the left of the small existing trees outside of the site.	
V3 – Southern site boundary corner (Outside 1 Perry Street)	The north-western noise wall bordering the site is clearly visible from this location and obscures views over the M2 Hills Motorway to private dwellings on the northern side of the motorway, however a band of mature tree canopy is visible over the wall. Gravel roads are visible amongst grassed landform, the most noticeable of which is the significant grassed mound to the right of the view.	Low	High	As a result of the proposed landscaping on the landscape batter which would be in the foreground of the view, the level of planting in the area would be significantly increased. The mix of low level planting as well as proposed screening trees would filter views into the site, however elements of the site would remain visible as a result of the viewpoint proximity. A noticeable change to the ground level would occur, particularly as a result of the levelling of the grassed mound to the right of the view. Filtered views of the entrance/exit area and boom gates would be possible from this location, as would the parking bays in rows C and D. The proposed retaining wall would be visible running parallel to row D with	Moderate

Viewpoint	Description of existing view	Visual sensitivity	Magnitude of change	Visual impact	Overall impact
				views of the upper levels of the Proposal slightly visible to the very right of the view.	
V4 – Driveway of Muirfield Golf Club	A clear view into the site looking north-west is possible from this location. In the foreground can be seen Perry Street with the driveway entrance into the site visible. Chain wire fencing topped with barbed wire. A gravel road can be seen beyond the fencing, with grassed areas to the left and right of the view. In the distance can be seen the noise wall which obstructs views of the M2 Hills Motorway and private dwellings beyond, however the tops of the canopies of mature vegetation to the north of the motorway are visible over the wall.	Moderate	High	A clear view of the entrance/exit and boom gates would be possible from this location. Views of parking rows C and D would be visible receding towards the noise wall, as would the proposed retaining wall running parallel to row D. A number of proposed landscaping islands would be visible, located at the end of rows C and D, as well as on the upper level of row E which would add vegetative elements to the view. Asphalt would become a highly noticeable element of the visual scene and would replace the grassed and gravel elements of the current view. A further highly visible change would result in the levelling of mound to the right of the view.	High/Moderate
VP5 – Pedestrian crossing on the corner of Barclay Road and Perry Street	Perry Street is clearly visible in the foreground before receding into the distance and rounding the corner to the left of the view, with a number of parked cars located on either side of the street. To the right of the view the most noticeable element is the significant grassed mound located on site, as well 3 eucalyptus trees running parallel to the site boundary. Beyond the mound on the right hand side of	Low	Moderate	As a result of the Proposal the grassed mound to the right of the view would be removed, which would open up views towards the western edge of the Proposal and beyond. Views over the asphalt parking bays (and parked cars) would become visible. Proposed vegetative islands throughout the site would add an additional level of planting not currently present on the site (apart from the existing eucalyptus trees).	Moderate/Low

Viewpoint	Description of existing view	Visual sensitivity	Magnitude of change	Visual impact	Overall impact
	the view can be seen a number of private dwellings that border the site and are surrounded by a significant level of mature vegetation.			Further landscaping would occur on the landscape batter proposed (located on the boundary of 1 Perry Street). This is anticipated to highly filter views of the residential dwellings currently visible, as well as increasing the green band that is created in that area as a result of existing mature vegetation.	
VP6 – Entrance / exit to Barclay Road commuter car park	The foreground of the view consists of Barclay Road and the pedestrian crossing linking the Barclay Road Commuter Car Park and the Perry Street on the opposite side. Site fencing can be seen running parallel to the pedestrian footpath along Barclay Road and receding into the distance along Perry Street. The crest of the grassed mound can be seen beyond this fencing and obscures views of the rest of the site (apart from the line of eucalyptus trees running along Perry Street). The canopies of existing mature vegetation outside of the site boundary is visible beyond the crest of the mound, as is a small amount of roofing of private dwellings located south-west of the site.	Low	Moderate	The removal of the grassed mound and eucalyptus trees would be the most noticeable change to the visual scene from this location. The removal of the mound would allow for more long distance views south-west to the mature vegetation. Parking rows M and N (and the parked cars in these rows) would be the most noticeable rows, with elements of the other proposed rows becoming less visible as a result of the change in levels and distance. Proposed vegetative islands throughout the site would help to add some new planting to the view which would partially filter views. Although the removal of the grassed mound and the change in elevation would have most likely resulted in increased views of number 1 and 3 Perry Street, the proposed landscaping on the landscape batter would highly filter views of these properties.	Moderate/Low

Viewpoint	Description of existing view	Visual sensitivity	Magnitude of change	Visual impact	Overall impact
V7 – Pedestrian entrance/ exit to M2 Barclay Road Bus Interchange	Elements of Barclay Road comprise the majority of the visual scene. In the immediate foreground can be seen low level fencing at the entrance/exit to the pedestrian footbridge leading to the bus stops located on the M2 Hills Motorway. On the opposite side of the road can be seen the pedestrian footpath as well as the significant wire safety screens running parallel to this over the motorway. In the more distant view through the screening can be seen the northern segment of the noise wall running parallel to the motorway. A small fraction of the grassed mound on site can be seen beyond this, with chain wire fencing visible around it. Beyond this can be seen the mature vegetation located within the Muirfield Golf Club.	Low	Low	Views of the site would be limited from this location, with the most noticeable change being the removal of the grassed mound which is visible. This would change the levels in the area and allow for a slight increase in views towards the golf course. When the car park is operational it is anticipated that a small number of parked vehicles in rows M and N would be visible, however the majority of the site would not be visible.	Low

A photomontage has been prepared to illustrate the Proposal following construction, as shown in Figure 6-6. The photomontage is from viewpoint 1.

Figure 6-6 Photomontage of the Proposal.

All lighting associated with the Proposal would be designed in accordance with the requirements of the Australian Standard AS4282 *Control of the Obtrusive Effects of Outdoor Lighting* including to minimise light spill impacts to surrounding residential receivers.

The Proposal would result in a noticeable change from the gravel and grassed landform of the site to one that consists largely of asphalt that would be occupied by a number of vehicles at any one time.

Although the removal of the grassed mound would result in greater views into the site from Barclay Road and Perry Street, the proposed vegetation would help to offset the increase in asphalt and vehicles that would become visible. As a result of pedestrians and motorists on both Barclay Road and Perry Street being transitory, and generally for very limited amounts of time, the sensitivity of these viewers is significantly lower than if the immediate catchment was dominated by private dwellings that would have extended periods of viewing the Proposal.

As a result of the majority of views falling into the moderate/low to low rating, combined with the highly limited visual catchment and proposed landscaping features, it is considered that the visual impacts of the Proposal are highly limited.

6.2.3 Mitigation measures

The design for the Proposal would incorporate a number of positive characteristics which would reduce potential landscape character and visual impacts (including light spill), these would be refined and confirmed during detailed design. An Urban and Landscape Design Plan (ULDP) which includes the public domain, would also be prepared.

Landscaping would use species endemic to the area where possible. Following construction of the Proposal, landscaping would be maintained to a high standard and weeds would be removed.

Detailed design of the façade of the retaining walls would consider muted colours and tones to blend the Proposal with the natural elements of the surrounding neighbourhood, and create a less obtrusive façade.

Refer to Table 7-1 in Section 7.2 for the proposed mitigation measures with respect to potential visual impacts.

6.3 Noise and vibration

A Noise and Vibration Impact Assessment (NVIA) was undertaken by Acoustic Studio in November 2020 for the Proposal (Acoustic Studio, 2020). The results of the NVIA are summarised below.

6.3.1 Existing environment

The Proposal site is situated within a suburban area with the following land uses, as depicted in Figure 4-1:

- E2 – Environmental conservation
- R2 – Low density residential
- R3 – Medium density residential
- RE1 – Public recreation
- RE2 – Private recreation
- SP2 – Infrastructure.

The Proposal site is located within a suburban environment, which is characterised by medium to high levels of traffic and vehicle activity throughout the day and evening, and low levels of activity in the night.

Acoustic Studio identified the following potentially noise sensitive receivers around the Proposal site, which are grouped into Noise Catchment Areas (NCA) with representative potentially worst-case locations identified with receiver ID's are given in Table 6-9 below, and shown in Figure 6-7.

Table 6-9 Potentially Noise Sensitive Receivers

Noise Catchment Area	ID	Description Address	Type
Perry Street	R01	Perry Street	Residential
	IND01	Lenton Place	Industrial
Barclay Road East	R02	Barclay Road (East)	Residential
	AR01	Muirfield Golf Club	Active recreation
	SC01	Muirfield High School	School classroom
Barclay Road West	R03	Barclay Road (West)	Residential

A survey of the existing noise environment at and in the vicinity of the site was conducted through unattended noise monitoring to continuously record the noise levels at the site. Unattended long-term noise monitoring was carried out from Thursday 8 October 2020 to Tuesday 20 October 2020 at the Proposal site and nearest residential noise receiver to

establish the typical range of ambient and background noise levels at the receiver locations. The loggers recorded L_{A1}, L_{A10}, L_{A90} and L_{Aeq} noise parameters at 15-minute intervals continuously for the measurement period. The location of the unattended long-term noise monitoring locations are shown below in Figure 6-7.

Operator attended, short-term monitoring was also carried out on 16 October 2020 and 20 October 2020 to supplement the long-term outdoor data across the site and at key surrounding receivers, and to obtain spectral data for traffic noise at the Proposal site. These included measurements at the property boundaries of the closest residential properties, which were then used to confirm that the long-term monitoring data at each location is representative of the background and ambient noise levels at the nearest sensitive noise receivers. The attended short-term noise monitoring locations are shown below in Figure 6-7.

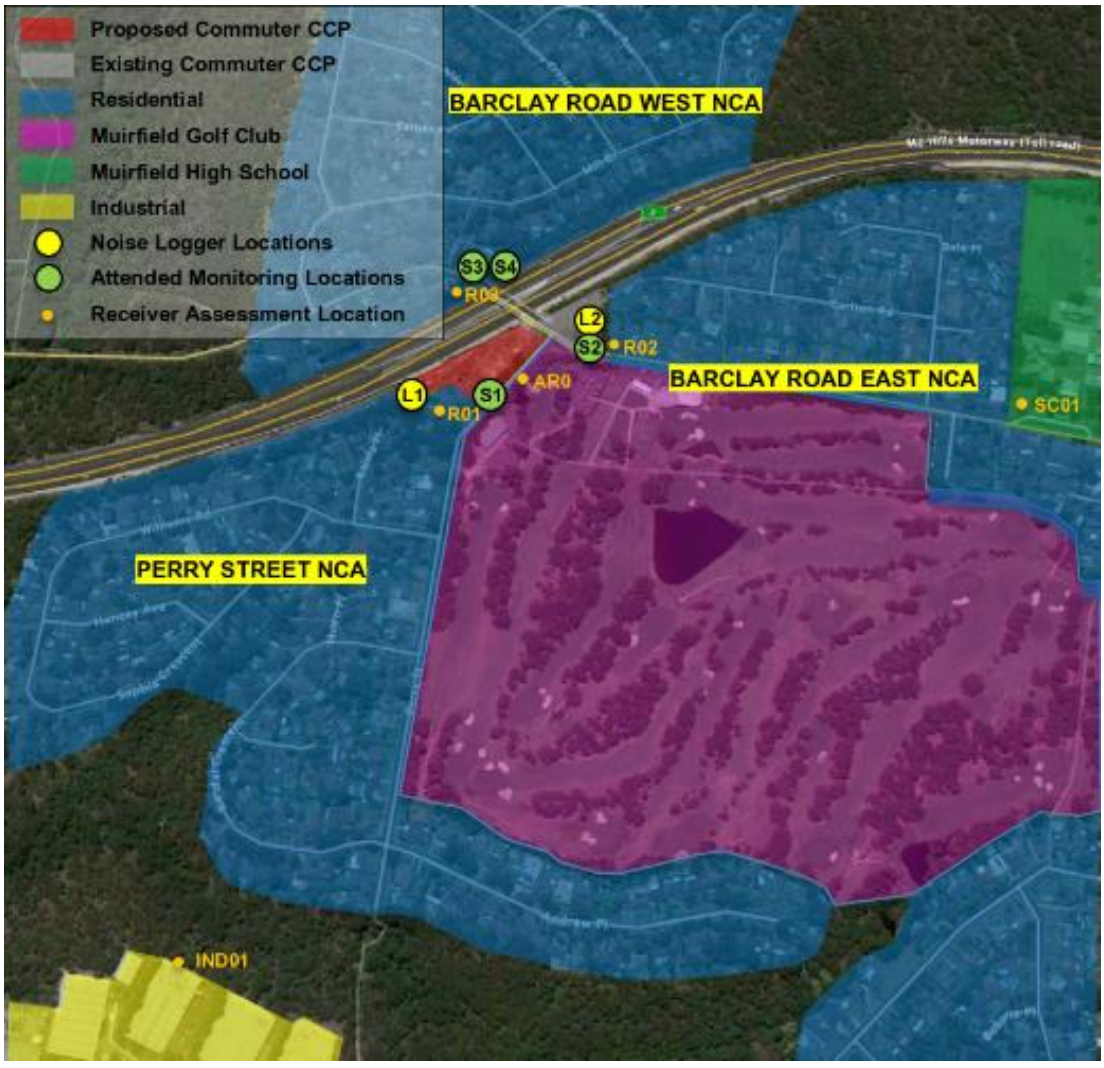

Figure 6-7 Aerial view of the Proposal site in relation to noise-sensitive receivers (Source: Acoustic Studio, 2020).

Traffic noise monitoring results are summarised in Table 6-10 below. These are corrected to the distance from the centre of the road line to the closest (potentially most affected) residences, around 17 metres for Perry Street and around 20 metres for Barclay Road residences.

Table 6-10 Summary of measured traffic noise levels (Source: Acoustic Studio, 2020).

Location	Day (dB(A) 1 hour period at kerb) L_{eq} (1 hour – 3.00pm to 4.00pm)	Night (dB(A)1 hour period at kerb) L_{eq} (1 hour – 1.00am to 2.00am)	Day (dB(A) Period adjusted to kerb from logger location) L_{eq} (15 hour)	Night (dB(A) Period adjusted to kerb from logger location) L_{eq} (9 hour)
Barclay Road	66	59	66	58
Perry Street	59	52	-	-

The background sound level is defined as the sound level exceeded 90 per cent of the time, and is designated as the L_{90}. The ambient noise level impacting on buildings is referred to as the equivalent continuous sound level (L_{Aeq}). These parameters are commonly used to describe a time varying noise such as traffic noise.

Background sound levels have been established in general accordance with the methodology described in the NSW *Noise Policy for Industry* (NPI) (Environment Protection Authority, 2017). These background noise levels are shown in Table 6-11 below, together with the L_{Aeq} ambient noise levels measured for each period. Based on observations during the site inspections, both ambient and background noise levels around the proposal site are generally dominated by traffic noise and general urban hum.

Table 6-11 Long-term background and ambient noise levels (Source: Acoustic Studio, 2020).

Location	dB(A) Background Day 7am-6pm	dB(A) Background Evening 6pm-10pm	dB(A) Background Night 10pm-7am	dB(A) L_{eq} Ambient Day 7am-6pm	dB(A) L_{eq} Ambient Evening 6pm-10pm	dB(A) L_{eq} Ambient Night 10pm-7am
Logger location 1	52	43	36	57	52	52
Logger location 2	52	48	37	66	64	58

A summary of the measured values of short-term background and ambient noise monitoring around the existing site is provided below in Table 6-12.

Table 6-12 Summary of short-term traffic, background and ambient noise levels (Source: Acoustic Studio, 2020).

Location	Time	Descriptor	Overall dB(A)
S1	4.40 pm 16 October 2020	L_{eq}	62
		L_{90}	50
	2.45 pm 20 October 2020	L_{eq}	61
		L_{90}	49
S2	3.30 pm 16 October 2020	L_{eq}	68

Location	Time	Descriptor	Overall dB(A)
		L_{90}	58
	3.05 pm 20 October 2020	L_{eq}	69
		L_{90}	57
S3	4 pm 16 October 2020	L_{eq}	69
		L_{90}	58
S4	4.20 pm 16 October 2020	L_{eq}	59
		L_{90}	56

6.3.2 Potential impacts

a) Construction phase

Noise

Noise criteria

The assessment includes identification of potentially affected assessment locations, description of activities involved in the Proposal, derivation of the construction noise criteria for standard construction working hours and out of hours periods, and quantification of potential noise impacts at receivers.

The assessment and management of noise from construction works is completed using 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 and the Noise Management Levels (NML) provide noise criteria for construction. The application of the ICNG criteria is outlined below in Table 6-13.

Table 6-13 ICNG recommended NMLs.

Provision description	NML ($L_{Aeq\ 15\ minutes}$)	Application
Recommended standard hours: Monday to Friday 7.00am to 6.00pm Saturday 8.00am to 1.00pm No work on Sunday or Public Holidays	Noise affected RBL + 10dB	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured L_{Aeq},15min is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise. The proponent should also inform all potentially

Provision description	NML ($L_{Aeq\ 15\ minutes}$)	Application
		impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75dB(A)	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above this level, the proponent should consider very carefully if there is any other feasible and reasonable way to reduce noise to below this level. If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with the impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that would be provided.
Outside recommended standard working hours	Noise affected RBL + 5dB	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected level. Where all feasible and reasonable practices have been applied and noise is more than 5dBA above the noise affected level, the proponent should negotiate with the community.

Project specific NMLs for airborne noise have been developed based on the measured background noise levels at the site and are summarised in Table 6-14 below. Ground-borne noise levels are for evening and night-time periods only and are therefore not required as part of this assessment.

Table 6-14 Project specific residential construction Noise Management Levels for airborne noise (Acoustic Studio, 2020).

Location	Period		Rating Background Level (RBL), dB(A)	Noise Management Level $L_{eq\ (15\ minutes)}$ dB(A)	
Residential	Recommended standard hours	Monday to Friday 7.00am to 6.00pm	52	RBL + 10	62
		Saturday 8.00am to 1.00pm	52		62

The ICNG also provides recommended construction NMLs for commercial, industrial and educational facilities surrounding a construction site, which are given in Table 6-15 below.

Table 6-15 Noise Management Levels for airborne noise at non-residential receivers.

Occupancy	Management level (dB(A))
Classrooms at schools and other educational institutions	45 – internal
Active recreation area	65
Passive recreation area	60
Commercial	70
Industrial	75

The NSW *Road Noise Policy* (RNP) (EPA, 2011) provides criteria for traffic generated on roads from land use development. The criteria applies to additional traffic generated on public roads from construction vehicles and traffic. RNP criteria for additional traffic generated on public roads is given below in Table 6-16 with the assessment criteria external unless otherwise specified. Results from the traffic noise level measurements along Barclay Road and Perry Street presented in Table 6-10 show that the existing traffic noise levels are currently equal to or exceeding the dB $L_{Aeq\ (1\ hour)}$ RNP criteria for all receiver types surrounding the site. In such cases the increase in the traffic noise levels arising from the additional traffic generated from land use development is assessed in relation to existing noise levels.

Table 6-16 RNP assessment criteria for additional traffic on local roads generated by land use development including construction vehicles and traffic (Source: EPA, 2011).

Receiver	Day (7.00am to 10.00pm) $L_{Aeq\ (period)}$	Day (7.00am to 10.00pm) $L_{Aeq\ (period)}$
Residential (sub arterial)	60 (15 hour)	55 (9 hour)
Residential (local)	55 (1 hour)	50 (1 hour)
School classrooms (educational)	40 (1 hour) Internally - when in use	-
Open space (active use)	60 (15 hour)	-

Receiver	Day (7.00am to 10.00pm) $L_{Aeq\ (period)}$	Day (7.00am to 10.00pm) $L_{Aeq\ (period)}$
	When in use	
Open space (passive use)	55 (15 hour) When in use	-

Noise impacts

The Transport for NSW *Construction Noise and Vibration Strategy* (CNVS) outlines the maximum noise levels for typical plant and equipment that can be used as a guide for production of construction noise. Types of plant and associated noise levels are listed in Table 6-2 of the NVIA (Acoustic Studio, 2020). The potential sources of ground-borne noise during the Proposal include:

- Rock breaking and excavation
- Vibratory rollers

Ground-borne noise impacts are likely to be highest during excavation stages of the Proposal, when equipment such as rock breakers and jackhammers are used. Construction traffic movements around the site and on public roads would have the potential to impact on nearby noise-sensitive receivers.

The following potential noise impacts have been summarised form the assessment undertaken by Acoustic Studio (Acoustic Studio, 2020).

Construction works noise impacts would be greatest adjacent to the site at the residential receiver (R01) in the Perry Street NCA. This is associated with various construction activities which are generally predicted to be above the NMLs, and at times exceed the highly affected NML due to the proximity to the nearest affected receivers. The worst-case noise impacts are for excavators with hammers, and clearance of vegetation above the NMLs by up to 28 dB when at the closest position to the receivers.

Noise levels from operations of various plant and equipment are predicted to be up to 8 dB lower when location of activities within the site boundary are further away from a particular receiver.

Across Perry Street, at the nearest active recreation sensitive receiver (AR01) in the Barclay Road East NCA, noise level predictions at the boundary exceed NMLs by up to 16 dB when considering the closest position from the proposed construction site.

Noise levels at the residential receiver (R02) in the Barclay Road East NCA are predicted to exceed the NMLs by up to 10 dB but less than the highly noise affected NML when considering the closest position from the proposed construction site.

Generally, for all other receivers (including residential receivers to the north across the M2 Hills Motorway), the noise generated from the construction works noise is below the highly noise affected NML and able to meet the NMLs and achieve the relevant criteria when further from the perimeter boundary.

The predictions for noise levels above NMLs is not unusual given the heavy plant and equipment that must be used, such as excavators and plant for clearing vegetation, and the proximity to sensitive receivers.

Construction traffic along the roads surrounding the site are within the relevant noise targets during the day-time period.

Implementation of all reasonable and feasible mitigation measures for all works would ensure that any adverse noise impacts to surrounding receivers are minimised where NMLs cannot be

met due to safety or space constraints. These would be further considered in the detailed design phase.

Noise impacts associated with ancillary works along Perry Street and if required within the Barclay Road commuter car park would be minor and short-term, and would be carried out during standard working hours. Best practice noise management would be incorporated into the construction of these works to ensure noise impacts are minimised to nearby residential receivers.

Vibration

Vibration criteria

Construction vibration is assessed in terms of human discomfort, disruption to sensitive equipment, and structural damage.

The Transport for NSW CNVS provides a guide for minimum working distances for typical items of vibration intensive plant, which has been used to inform the vibration assessment. A detailed assessment has not been undertaken at this stage of design, as the actual vibration levels would be dependent upon site and strata characteristics and specific construction equipment used.

Vibration impacts

Activities that have the potential to general the highest levels of vibration during construction works would include use of larger excavators with hammers and larger vibratory rollers.

It is anticipated that construction works would result in some human perception vibration impacts and surrounding receivers, particularly from the use of excavators with hammers and vibratory rollers near 1 Perry Street. The degree of these impacts would be determined as part of the Construction Noise and Vibration Management Plan (CNVMP) prepared prior to construction.

b) Operational phase

Noise emissions associated with the operation of the car park include traffic noise generation on surrounding roads and noise from the use of the car park (vehicle movements within the car park).

The predicted traffic noise levels were prepared using the predicted traffic volumes from the traffic assessment prepared by GTA Consultants (GTA Consultants, 2020). The increase in traffic noise is predicted and compared against RNP criteria of relative traffic noise increase, as presented in Table 6-17.

Table 6-17 Predicted traffic noise levels increase street surrounding the Proposal (Source: Acoustic Studio, 2020).

Road / street	Time	Base Peak hour traffic volume	With Proposal Peak hour traffic volume	Increase in traffic noise (dBA) Criteria ≤ + 2dB(A)	Complies?
Perry Street Barclay Road East	AM	167	207	0.9	Yes
	PM	156	190	0.9	Yes

Barclay Road West Perry Street	AM	1943	1955	0.0	Yes
	PM	1732	1745	0.0	Yes
Barclay Road East	AM	2017	2099	0.1	Yes
	PM	1790	1817	0.1	Yes

Based on the above prediction, the traffic generation on Barclay Road as a result of the proposal would be less than 2 dB and complies with the RNP.

The predicted operational noise levels associated with the operation of the car park is predicted to exceed the NPI criteria for the night period at the nearest residential receiver location (R01) in the Perry Street NCA by 4 dB. It is noted that these levels are below the pre-existing ambient noise levels at the site (52 dB from Logger location 1), which are generally driven by the M2 Hills Motorway noise. Given this result, noise attenuation treatments to the buildings of residential receivers are not considered necessary. To address noise impact and sleep disturbance risks (see discussion below), mitigation that could be considered includes installation of a fence or noise barrier in addition of, or to replace the existing mesh fence at the boundary of Perry Street NCA (R01). Suitable boundary landscaping would also be considered, noting that it has marginal benefit as noise attenuation. Adjacent affected residents would be further consulted to determine appropriate mitigation measure(s).

Operational noise levels at all other receivers are predicted to comply with the relevant criteria.

Noise levels were also assessed for sleep disturbance against the relevant NPI criteria. The predicted levels are marginally above (2 dB) the sleep awakening level at the nearest affected receiver location (R01) in the Perry Street NCA. All other locations are predicted to be below the Sleep Awakening Level. When considering the M2 Hills Motorway bus timetable, the time of night that these events are likely to occur are between 10.00pm to 1.00am and 4.00am to 7.00 am. The background noise level during these periods is currently 5 to 10 dB higher than the middle of the night (2.00am to 3.00am).

6.3.3 Mitigation measures

During detailed design, consideration would be given to ensuring the car park design, including materials and finishes, mitigates the potential for wheel squeal generated during operation of the car park.

Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (Transport for NSW, 2019b) and the NVIA for the Proposal (Acoustic Studio, 2020). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection, where practical.

The construction Contractor would undertake environmental noise monitoring at the boundaries of nearby sensitive residential receivers along Perry Street to verify the noise impacts during construction with further action taken or refinement of mitigation measures and the CNVMP as relevant.

The Proposal is designed to be an open-air car park with the existing mesh fence which may be retained at the perimeter boundaries adjacent to residential receivers. Operational noise mitigations that could be considered includes the installation of a fence or noise barrier in addition of, or to replace the existing mesh fence at the boundary of Perry Street NCA (R01).

Suitable boundary landscaping would also be considered, noting that it has marginal benefit as noise attenuation. Adjacent affected residents would be further consulted to determine appropriate mitigation measure(s).

Refer to Table 7-1 in Section 7.2 for the proposed mitigation measures with respect to potential noise and vibration impacts.

6.4 Indigenous heritage

6.4.1 Existing environment

The Proposal would be located within the traditional country area of the Darug / Dharug area, which closely borders the Guringai area to the north. For over 60,000 years, the area comprising present day Parramatta was occupied by the *Burramattagal* people, a clan of the Darug, who first settled along the upper reaches of the Parramatta River. *Burramattagal* is thought to be derived from the Aboriginal word for '*place where the eels lie down'*.

A search for known Indigenous heritage items within the area of Lat, Long: -33.766, 151.0127 to Lat, Long: -33.7642, 151.0155 (plus a 200 metre buffer) was undertaken on 6 October 2020 using the AHIMS database (Heritage NSW, 2020).

The AHIMS search identified one known Indigenous heritage item within the vicinity of the site. It is confirmed from AHIMS that this recorded site is not located within Lot 170 DP 1151136. Given the extensive landscape modification and development of the site, including earthworks, intact evidence of Aboriginal land use would be unlikely to occur within the Proposal site.

6.4.2 Potential impacts

a) Construction phase

Construction of the Proposal would involve major earthworks and ground disturbing activities, particularly for the cutting and grading of the car park terraces. These ground disturbing activities have the potential to impact Aboriginal objects, if present. However, as it is considered highly unlikely that any such objects are located on the site, no high risk landscape features (i.e. watercourses, food resources and other inorganic resources such as stone or ochre) are located at or near the Proposal site, it is unlikely that the Proposal would affect Indigenous heritage during construction.

b) Operational phase

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

6.4.3 Mitigation measures

All construction staff would undergo an induction in the recognition of Aboriginal cultural heritage. This training would include information such as the importance of Aboriginal cultural heritage materials and places to the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites.

If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019e) would be followed, and works within the vicinity of the find would cease immediately.

The Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in coordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the Environment, Energy and Science Group in the Department of Planning, Industry and Environment (formerly OEH) and the Local Aboriginal Land Council.

If human remains are found, work would cease, the site secured and the NSW Police and the EES Group would be notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit (AHIP) would be obtained prior to works recommencing at the location.

Refer to Table 7-1 in Section 7.2 for the proposed mitigation measures with respect to potential Indigenous heritage impacts.

6.5 Non-Indigenous heritage

6.5.1 Existing environment

A desktop assessment was undertaken to identify potential non-Indigenous heritage items within the vicinity of the Proposal. The assessment included a review of the following online databases:

- Australian Heritage Database
- NSW State Heritage Inventory (SHI)
- Parramatta (former The Hills) LEP 2012 and The Hills LEP 2019
- Section 170 Heritage and Conservation Registers.

The assessment did not identify any heritage items, heritage conservation areas or archaeological sites within the site boundaries. The nearest listed heritage items are the locally listed '*Baulkham Hills Public School"* (Item no. I29) listed on the Parramatta (former The Hills) LEP 2012 which is located over 1 kilometre from the Proposal site. No other heritage sites have been identified in the vicinity of the site.

Due to the highly disturbed nature and history of earthworks at the site, it is considered highly unlikely that any archaeological relics exist within the site.

6.5.2 Potential impacts

a) Construction phase

As there are no listed non-Indigenous heritage items in close proximity to the Proposal site, the ground disturbance and other construction activities are unlikely to damage, displace or destroy an item or relic of heritage value.

b) Operational phase

No impacts to non-Indigenous heritage items or relics in the vicinity of the Proposal are anticipated during operation of the Proposal.

6.5.3 Mitigation measures

In the event that any unexpected archaeological deposits are identified within the Proposal site during construction, works within the vicinity of the find would cease immediately and the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019e) would be followed.

Refer to Table 7-1 in Section 7.2 for the proposed mitigation measures with respect to potential Non-Indigenous heritage impacts.

6.6 Socio-economic impacts

6.6.1 Existing environment

As outlined in Section 1.2, the Proposal is located within the suburb of North Rocks within the City of Parramatta LGA. The areas to the north east and south west are low density residential. A golf course is located on the opposite side of Perry Street. Muirfield High School is located around 500 metres from the site.

The population of North Rocks was 7,965 in 2016 according to the Australian Bureau of Statistics (ABS) from the 2016 Census data. The vast majority of residents lived in separate houses (90.2%) and only a very small number of residents lived in apartments (1.7%) (ABS, 2016).

The majority of residents travel to work by car (69.1%), with around 11.5% of residents using the bus for at least a part of their commute to work. This is above the average in comparison with greater NSW.

Currently the existing commuter car park that services the M2 Barclay Road Bus Interchange is over capacity, with up to 200 cars observed using overflow parking on local streets before the COVID-19 pandemic (FutureRail, 2020b).

6.6.2 Potential impacts

a) Construction phase

The Proposal has the potential to impact residents and businesses within the vicinity of the work through:

- temporary visual, noise and vibration impacts
- minor delays on the adjacent road network.

Construction activities would be predominantly confined within the Proposal site, although some work is anticipated to occur outside of these boundaries, such as works to the entry and exit points of the car park.

Residents, City of Parramatta Council and businesses would be notified of the work, and where practicable, consulted about construction timing and any traffic management arrangements, including detours, if required.

Existing residents and nearby private recreation facilities may also be impacted by changes in the visual landscape (Section 6.2) and noise (Section 6.3).

It is not anticipated that any temporary acquisitions would be required for construction.

b) Operational phase

The Proposal would result in the addition of around 135 extra commuter car parking spaces available in the area around the M2 Barclay Road Bus Interchange. The longer term social and economic impacts of the Proposal would be positive for both residents and businesses of North Rocks, and particularly for commuters who frequent the interchange.

It is anticipated that, once operational, the provision of additional parking spaces would increase the number of vehicles operating within the immediate vicinity of the Proposal. However, longer trips to major employment areas, such as the Sydney CBD, may be reduced through the uptake of public transport.

There would be improved connectivity of the M2 Barclay Road Bus Interchange for commuters as well as a reduction in the number of commuters utilising nearby streets for weekday parking. The new parking facilities would help to encourage more people to use public transport.

6.6.3 Mitigation measures

Mitigation and management measures would be implemented to avoid, minimise or manage potential socio-economic impacts. These mitigation and management measures have been identified in Chapter 7. Specific measures to manage impacts associated with traffic, noise, air quality and visual amenity are outlined in the following Sections:

- Traffic and transport – Section 6.1
- Noise and vibration – Section 6.3
- Air quality – Section 6.10
- Visual amenity – Section 6.2.

Sustainability criteria for the Proposal would be established to encourage the Construction Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.

A CLMP would be prepared prior to construction to identify and engage with all potential stakeholders and best practice methods for consultation with these groups during construction. The CLMP would also encourage feedback and facilitate opportunities for the community and stakeholders who have input into the project, where practicable. The CLMP would include the following:

- a comprehensive, project-specific analysis of issues and proposed strategies to manage issues through the duration of the Project
- details of the communication tools (traditional and digital) and activities that would be used to inform and engage the community and stakeholders
- a program for the implementation of community liaison activities relating to key construction tasks with strategies for minimising impacts and informing the community
- policies and procedures for handling community complaints and enquiries, including the Contractor's nominated 24 hour contact for management of complaints and enquiries
- analysis of other major projects/influences in the area with the potential to result in cumulative impacts to the community and strategies for managing these.

The community would be kept informed of construction progress, activities and impacts in accordance with the CLMP to be developed prior to construction.

6.7 Biodiversity

An Ecological Assessment Report (EAR) was prepared in November 2020 by Cardno (Cardno, 2020) based on a desktop review of existing information and a site visit conducted on 6 November 2020. Government databases were also reviewed to identify threatened species, populations and ecological communities of the study area. These databases included:

- BioNet Atlas Database
- The Commonwealth EPBC Act Protected Matters Search Tool (PMST)
- Department of Primary Industry (Fisheries) Key Fish Habitat mapping
- OEH (2016) The Native Vegetation of Sydney Metropolitan Area mapping.

The results of the EAR are summarised below.

6.7.1 Existing Environment

A site inspection was undertaken of the 6 November 2020 within the study area shown in Figure 6-8. The study area consists predominantly of cleared land with exotic plant species, and a small patch of disturbed vegetation. Cleared land without vegetation includes unsealed tracks with gravel, drain line, culvert and concreted areas. The large stockpile area on the eastern portion of the site is covered in exotic plant species. Exotic cover also occur in other areas across the site. Landscaped areas with planted natives and exotics were recorded along boundaries, including remnant native trees. Disturbed native vegetation was recorded in the western portion of the study area. The recorded disturbed vegetation area does not correspond to any known Plant Community Type (see Table 6-18).

An additional site inspection of the ancillary works areas was undertaken by Urban Arbor on the 20 November 2020. Results of the site inspection indicated that there are approximately 17 River She-Oak (*Casuarina cunninghamiana*) trees within the ancillary works area in the Barclay Road commuter car park.

No threatened species were recorded within the study area.

Ground-truthed vegetation mapping is shown in Figure 6-8.

Table 6-18 Vegetation communities and cleared areas (Source: Cardno, 2020).

Plant Community Type (PCT) ID	PCT Name	Condition	Area (ha)
Native Vegetation			
1845	Smooth-barked Apple – Red Bloodwood – Blackbutt tall open forest on shale sandstone transition soils in eastern Sydney	Low	0.057
Miscellaneous areas			
-	Remnant native trees	Not applicable	0.024
-	Landscaped areas	Not applicable	0.070
-	Exotics	Not applicable	0.361
-	Cleared	Not applicable	0.076

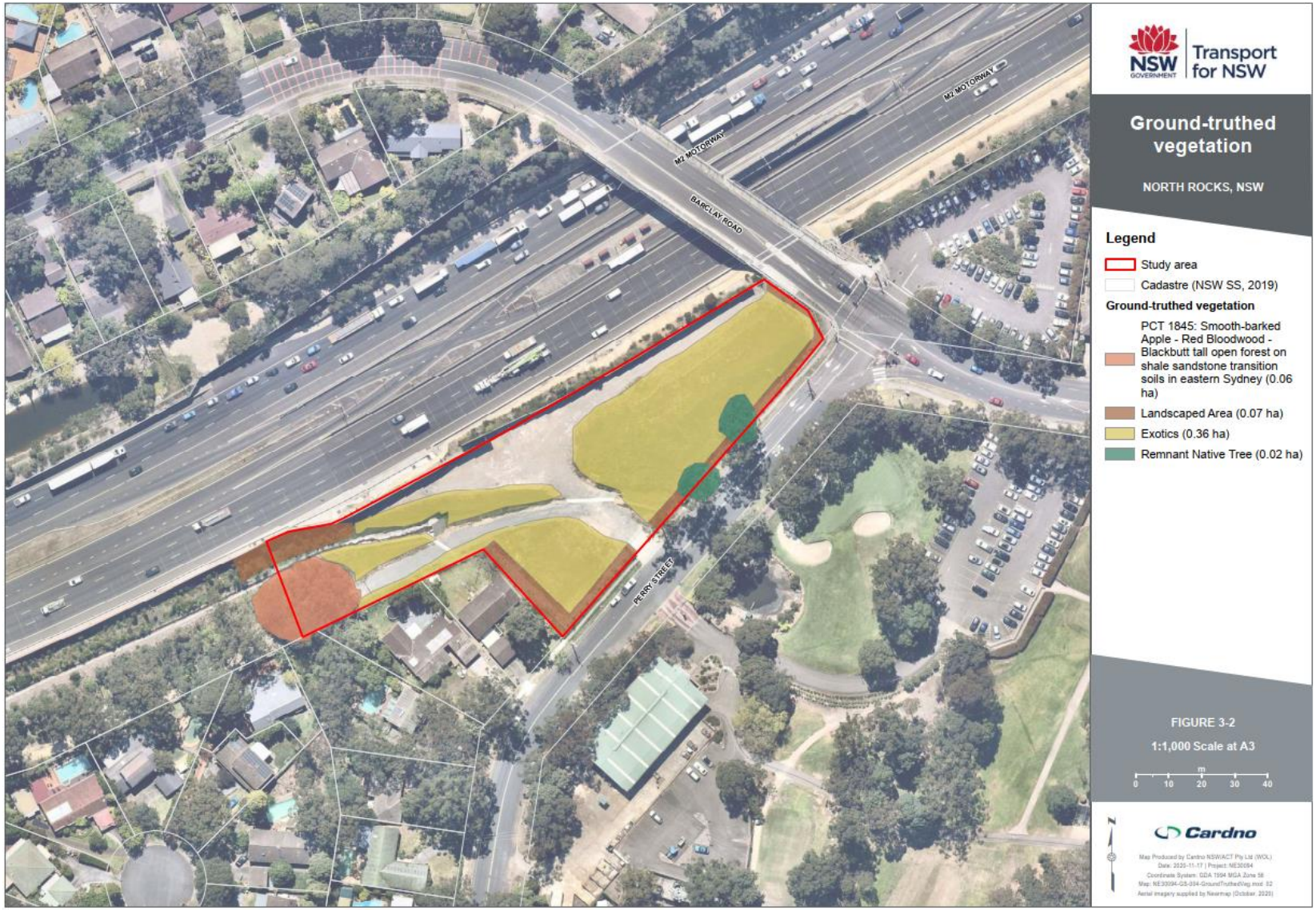

Figure 6-8 Ground-truthed vegetation (Source, Cardno, 2020).

Native vegetation

The western portion of the study area is highly disturbed with waste (demolition materials) and cuttings of plants present. The diameter at breast height (DBH) of trees recorded within this vegetation patch range between 17 centimetres and 81 centimetres DBH. Trees with DBH ≥50 centimetres are generally considered to be relevant habitat. The vegetation in this area of the site is commensurate with PCT 1845 Smooth-barked Apple – Red Bloodwood – Blackbutt tall open forest on shale sandstone transition soils in eastern Sydney in a low condition (Figure 6-9). PCT 1845 is not associated with a Threatened Ecological Community (TEC).

Figure 6-9 View of native vegetation on the western portion of the site (Source: Cardno, 2020).

Remnant native trees

Remnant native trees occurred in the landscaped area adjacent to Perry Street (Figure 6-10), including a Red Bloodwood (*Corymbia gummifera)*, a Smooth-barked Apple (*angophera costata)* and a Turpentine *(Syncarpia glomulifera)*. The DBH of native remnant trees recorded within landscaped areas ranged between 60 centimetres and 95.3 centimetres DBH.

Figure 6-10 View of remnant native vegetation adjacent to Perry Street (Source: Cardno, 2020).

Landscaped areas

Landscaped areas occur along the eastern, north-western and north-eastern boundaries of the study area (Figure 6-11 to Figure 6-13), some of these areas show dominance in exotic species.

Figure 6-11 View of landscaped area on the north-western portion of the study area (Source: Cardno, 2020).

Figure 6-12 View of landscaped area adjacent to Barclay Road (Source: Cardno, 2020).

Figure 6-13 View of landscaped area along boundary with Perry Street (Source: Cardno, 2020).

Cleared areas with exotic groundcover

Cleared areas with exotic groundcover occurs across the study area (Figure 6-14). These areas do not include naturally occurring species.

Figure 6-14 View of exotic areas within the study area (Source: Cardno, 2020).

Weeds

A total of 50 flora species were recorded across the study area, including 15 native species (30%) and 35 exotics (70%) across 27 families. Ten of the 35 exotic species recorded within the study area are recognised as a Priority Weed (PW) within the City of Parramatta LGA and the NSW *Biosecurity Act 2015*, as a high threat weed (HTW) under the BC Act and/or as a Weed of National Significance (WoNS) under the national weed strategy (IPAC, 2016).

The following WoNS were recorded at the site:

- Asparagus Fern (*Asparagus aethiopicus*)
- Blackberry Complex (*Rubus fruticossus spp. agg.)*
- Lantana (*Lantana camara).*

The following HTW were recorded at the site:

- Asparagus Fern (*Asparagus aethiopicus*)
- Cobbler's Pegs (*Bidens pilosa*)
- Umbrella Sedge (*Cyperus eragrostis*)
- Camphor Laurel (*Cinnamomum camphora*)
- Spider Plant (*Chlorophytum comosum*)
- Small-lived Privet (*Ligustrum sinense*)
- Panic Veldtgrass (*Ehrharta erecta*)
- Blackberry Complex (*Rubus fruticossus spp. agg.)*
- Tree of Heaven (*Ailanthus altissima*)
- Lantana (*Lantana camara*).

The following PW were recorded at the site:

- Asparagus Fern (Asparagus *aethiopicus*), the species has the following biosecurity duties:
    - Prohibition on dealings: Must not be imported into the State or sold.

- Blackberry Complex (*Rubus fruticossus spp. agg*.), the species has the following biosecurity duties:
    - Prohibition on dealings: Must not be imported into the State or sold.
- Lantana (*Lantana camara*), the species has the following biosecurity duties:
    - Prohibition on dealings: Must not be imported into the State or sold.

Fauna species

A total of five fauna species were observed during surveys. Table 6-19 shows the full list of fauna. No threatened fauna species or pest fauna species were recorded within the study area and during surveys.

Table 6-19 List of fauna species within the study area (Source: Cardno, 2020).

Family	Scientific Name	Common name	BC Act status	EPBC Act status	Type of observation
Aves					
Anatidae	*Chenonetta jubata*	Australian Wood Duck	P	-	Seen
Artamidae	*Craticus tibicen*	Australian Magpie	P	-	Seen
Corvidae	*Corvus coronoides*	Australian Raven	P	-	Seen
Meliphagidae	*Manorina melanopcephala*	Noisy Miner	P	-	Seen
Psittacidae	*Trichoglossus haematodus*	Rainbow Lorikeet	P	-	Seen

Status: - = not listed; P = Protected; V = Vulnerable; E = Endangered; CE = Critically Endangered; Mi – Migratory; Ma = Marine.

A number of fauna habitats were observed within the study area, including:

- Hollow bearing tree
- Stags
- Logs
- Leaf litter
- Connectivity
- Aquatic habitat (non-naturally occurring).

The terrain across the study area slopes downward in a generally south-west direction, toward Darling Mills Creek riparian corridor in the wider locality. A man-made drain and culvert occurs within the study area and rainfall runoff is directed towards this structure and subsequently downhill toward the Darling Mills Creek riparian corridor bushland reserve in the wider locality (Figure 6-15 and Figure 6-16).

Figure 6-15 View of rainfall runoff exiting the culvert and heading south-west along the drain toward Darling Mills Creek riparian corridor (Source: Cardno, 2020).

Figure 6-16 View downhill from the material stockpile toward the culvert-drain system with runoff toward Darling Mills Creek riparian corridor bushland (Source, Cardno, 2020).

6.7.2 Potential impacts

a) Construction phase

Vegetation

The Proposal would be located in highly disturbed land consisting of cleared land with miscellaneous vegetation not consistent with endemic native vegetation communities. Overall, flora species present at the study area were predominantly exotics with some planted natives and four remnant native trees.

Native vegetation was recorded on the western portion of the study area. This vegetation corresponds to PCT 1845 and is present in a highly disturbed condition. Significant trees with DBH ≥50 centimetres DBH were observed therein. The possibility exists that up to 0.057 ha of PCT 1845 would be removed for the Proposal, including up to five trees from this area. The Proposal has the potential to impact native vegetation (PCT 1845) and significant trees located on the western portion of the Study Area.

Clearing of Native Vegetation is one of four Key Threatening Processes (KTPs) listed under the BC Act, the *Fisheries Management Act* (FM Act) and the EPBC Act. It is considered that the native vegetation that would be cleared from the site as part of the enabling works in accordance with the *Vegetation Management (Protection and Removal) Guideline* (Transport for NSW, 2019m) and would be offset in accordance with the *Vegetation Offset Guide* (Transport for NSW, 2019m). No net-loss of vegetation would be achieved by establishing an offset site of similar extent and with native vegetation of the same PCT or vegetation class. Provided no net-loss of native vegetation is achieved, triggering of this KTP would only be temporary.

The clearing of vegetation at the study area which is associated with loss of cooling effects provided by vegetation, would also contribute to Human-caused Climate Change, which is considered to be a KTP. New native trees would be planted in landscaping areas, subject to detailed design. Planted trees would provide localised cooling effects within the Proposal site.

Felled trees and logs could be salvaged into landscaped or other bushland areas in agreement with the Council, to ensure the removal of dead wood and dead tree KPT is minimised during enabling works for the Proposal.

No TECs listed under the BC Act or the EPBC Act were present within the study area.

Ancillary construction works would not significantly impact on the trees located at the Barclay Road commuter car park if required.

Threatened species

No threatened species were observed in the study area.

None of the threatened species predicted to occur within the 5 kilometre locality were identified as having a moderate, high or known likelihood of occurrence within the Study Area. Therefore, it is considered unlikely that the Proposal would result in significant impacts on threatened species.

Habitat and wildlife corridor

The Proposal would be located within a study area characterised as mostly cleared, landscaped with disturbed native vegetation. Endemic native vegetation in low condition occurs in the western portion of the study area, which is part of a larger patch of native vegetation extending further west along the M2 Hills Motorway towards reserved bushland along Darling Mills Creek riparian corridor.

A certain level of connectivity is maintained towards the west from the location of PCT 1845. However, no connectivity value occurs elsewhere within the Study Area.

Based on the above, it is predicted that shall the area of PCT 1845 be removed to give way to the Proposal, connectivity to the reserved bushland part of Darling Mills Creek riparian corridor would be reduced.

Aquatic Environment

Although no naturally occurring aquatic habitat occurs within the study area, it is noted that runoff from the study area down the slope towards remnant bushland within Darling Mills Creek riparian corridor occurs along the man-made culvert-drain system. It is considered that the construction of the Proposal has the potential to increase pollutant runoff such as accidental vehicle oil or fuel spill, waste and sediments towards remnant bushland and Darling Mills Creek beyond the study area. That, in turn, would have the potential to affect water quality in the riparian system and suitable aquatic habitat for native aquatic species.

b) Operational phase

Vegetation

Operation of the Proposal would not impact on vegetation at the site.

Threatened species

No threatened species were observed in the study area.

None of the threatened species predicted to occur within the 5 kilometre locality were identified as having a moderate, high or known likelihood of occurrence within the study area. Therefore, it is considered unlikely that the Proposal would result in significant impacts on threatened species.

Aquatic Environment

Alterations of the natural flow regimes of rivers, streams, floodplains and wetlands are considered a KTP. The Proposal would not directly affect the aquatic habitat, as none are present in the study area, however stormwater management would be determined during detailed design and would consider sediment and erosion controls to manage indirect impacts on Darling Mills Creek.

6.7.3 Mitigation measures

A number of avoidance measures would be considered during detail design to avoid impacts to biodiversity values at the site. These would include consideration of the following:

- installing project boundary fencing to ensure activities and ancillary facilities are restricted to the Proposed footprint
- using previously cleared and miscellaneous vegetated areas for construction laydown areas
- consideration of design refinement to avoid encroachment into PCT 1845 and/or the retention of large trees (with ≥50 centimetres DBH) within the site.

A number of mitigation measures would be considered during detailed design to manage potential construction and operation impacts to vegetation, wildlife and aquatic habitats.

Refer to Table 7-1 in Section 7.2 for the proposed mitigation measures with respect to potential biodiversity impacts.

6.8 Contamination, landform, geology and soils

6.8.1 Existing environment

A preliminary site investigation was carried out by FutureRail to provide a preliminary targeted assessment of the engineering properties including soil and groundwater conditions. The Limited Preliminary Site Investigation report prepared by FutureRail dated, 30 March 2020 included geotechnical, hydrogeology and topography and contamination findings (FutureRail, 2020a).

Soils and geology

The 1:100,000 Soil Landscape Series Sheet (Chapman G.A., Murphy C.L., Tille P.J., Atkinson G. and Morse R.J., 2009) indicates that the soil profile surrounding the site is underlain by the Lucas Heights Soil Landscape. Soils of this group are typically found in landscapes characterised by gently undulating crests and ridges on plateau surfaces with a local relief to 30 metres and slopes of less than ten per cent. These soils are moderately erodible and consist of loose, fine sand grains and moderate organic matter.

Soil limitations of the Lucas Heights Soil Landscape include being a stony soil, low soil fertility, and low available water capacity. Topsoils are hard setting and stone, and the sub-soils are occasionally sodic and impermeable.

The site is located close to a geological boundary. The north-eastern portion of the site is mapped as being underlain by Ashfield Shale, with the remainder of the site mapped as being underlain by Hawkesbury Sandstone (Department of Planning, Industry and Environment, 2019). Although the boundary between the two geological units is mapped at the site, due to the accuracy of the mapping, the boundary may not occur on the site.

The Proposal site is not mapped as likely to contain Acid Sulfate Soils or Potential Acid Sulfate Soils.

Landform and topography

The Proposal site's topography has been heavily modified over time. The site was previously used as a construction compound during NorthConnex project, during which time the ground surface was heavily altered. Modification during this time involved the relocation of an existing earth stockpile to other areas within the site. The earth stockpile was returned to its approximate pre-construction state by NorthConnex prior to the site being handed back to Transurban.

The Proposal site's current topography slopes from around 100 metres AHD in the north-east to around 86 metres AHD in the south west. The northern portion of the site's elevation is a result of fill material (FutureRail, 2020a).

Contamination

A review of the NSW EPA Contaminated Land Public Record on 2 October 2020, and the *Protection of Environment Operations Act 1997* (PoEO Act) Public Register on 2 October 2020 were undertaken and indicated that there are no registered sites located within a 500 metre radius of the site.

FutureRail (2020c) undertook a Preliminary Contamination Assessment for the site, which supplemented desktop study of the area with intrusive investigations of the site as part of a geotechnical drilling program. A total of six boreholes were drilled around the perimeter of the site (shown in Figure 6-17 below).

Borehole logs found that the fill material located on site was composed of various layers of gravel and silty clay, and sandstone rock. Soil screening using a photoionisation detector (PID) was carried out to check for volatile contaminants. The results ranged from 1.0 parts per million (ppm) to 12.6 ppm, generally indicating a low potential for volatile contamination within the sampled layers.

The soils encountered at the site were classified using the six-step process described in the *NSW EPA Waste Classification Guidelines Part 1: Classifying Waste* (EPA, 2014). Based on the soil samples tested, the classification concluded that the fill material contained on the site have a preliminary classification of General Solid Waste (non-putrescible).

Figure 6-17 Site borehole locations (Source: FutureRail, 2019c).

6.8.2 Potential impacts

a) Construction phase

Soil disturbance

The Proposal would require major earthworks and excavations work for the construction of the car park terraces, as well as for the installation of the retaining walls between the terrace tiers. Other trenching and excavation works would be required for installing new stormwater drainage services and on-site stormwater detention tank, laying of asphalt, and tree removal. Excavation and earthworks, if not adequately managed, could result in the following impacts:

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

Due to the high variability in topography of the Proposal site, soil erosion impacts through runoff and sedimentation of watercourses and stormwater downstream would be major during the construction phase. Surface water and water quality are assessed further in Section 6.9.

Contamination

Potential exposure of contaminated soils at the site have the potential to have negative effects on human and ecological receptors during construction. Based on the information available, FutureRail identified the following potential human receptors:

- site workers during future construction works or future maintenance activities
- future site users
- surrounding residential/rural site occupants and workers
- groundwater benefiting users.

FutureRail identified the following potential ecological receptors:

- downstream aquatic ecosystems such as surface waterbodies
- onsite vegetation.

Potential source-pathway-receptor (S-P-R) linkages are where contaminated media (soil, surface water and/or groundwater, if present) has the potential to adversely impact human health or ecological values for the site through complete exposure pathways. For a risk to exist, all three components (S-P-R) must exist.

Plausible linkages may occur for construction workers, surrounding users and ecological receptors in adjacent waterways during construction, however results from soil sample testing indicated that there was no exceedances of adopted assessment criteria, which was based on a multi-storey car park scenario. This is considered to be a conservative scenario, as a multi-storey car park would require earthworks at a greater scale than the Proposal and would therefore be of a higher contamination risk. It is considered that the scale of earthworks required for the Proposal would not pose a significant risk to construction personnel or the environment in the vicinity of the works with appropriate management measures.

In the absence of appropriate management measures, there is a risk that new contaminants may be introduced to the local environment during the construction of the Proposal. These could be introduced through the misuse and inappropriate storage of fuels and oils used for construction equipment and plant.

It is not expected that potential or actual Acid Sulfate Soils would be disturbed during the construction activities, as there are no Acid Sulfate Soils mapped near the Proposal. An Acid Sulfate Soils Management Plan would therefore not be required for the Proposal.

Contamination impacts as a result of any ancillary construction works are considered to be unlikely, due to limited depth of excavation required for footpath upgrade works and kerb adjustments within the Barclay Road commuter car park.

b) Operational phase

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

6.8.3 Mitigation measures

Detailed contamination testing would be undertaken during Detailed Design to confirm the risks of contamination on the site. A CEMP would be developed which would include a Contamination, Soil and Water Management Plan to manage potential impacts of contaminated soils during the construction and operation phases of the Proposal.

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.

Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the Transport for NSW *Chemical Storage and Spill Response Guidelines*.

Refer to Table 7-1 and Chapter 7 for a list of proposed mitigation measures.

6.9 Hydrology and water quality

6.9.1 Existing environment

Surface water and water quality

The Proposal site is located 400 metres north-east of the non-perennial, Darling Mills Creek, which eventually discharges into Rifle Range Creek, located around 700 metres south-west of the site. These waterways are shown in Figure 6-20.

Based on a preliminary study undertaken by FutureRail, the proposed stormwater discharge point is to the north-western corner of the site, where there is an existing overland flow path that connects downstream into Darling Mills Creek (Figure 6-18 and Figure 6-19). This overland flow path is concrete-lined and is utilised during storm events under existing conditions. Currently, pollution and contaminants that are conveyed by the overland flow path are managed by a vegetated swale that runs behind the residences on Perry Street before it meets Darling Mills Creek.

Details of the existing stormwater infrastructure near the site was provided by the City of Parramatta Council, and indicates that there is a stormwater drain located in the south-west of the site and is 750 millimetres wide.

Figure 6-18 View looking north-east of existing stormwater culvert infrastructure and overland flow path on the site (Source: Advisian, 2020).

Figure 6-19 View looking west of existing stormwater culvert infrastructure and overland flow path on the site (Source: Advisian, 2020).

Figure 6-20 Waterways around the Proposal site

Groundwater and groundwater dependent ecosystems

A preliminary search of the Department of Water and Energy Online Database was undertaken on 23 October 2020 to identify registered groundwater bores in the vicinity of the Proposal site. The search indicated that two bores are registered under the database within a 500 metre radius of the site.

The nearest groundwater bore to the site is located around 300 metres east of the site (GW105547) and is described as an exploration bore drilled to 306 metres below ground level (BGL). Water bearing zones were recorded in the driller's logs at 160-162 metres below ground level (BGL), 192-193 metres BGL, and 216-217 metres BGL.

The second borehole is located around 350 metres south-east of the Proposal site (GW105548) and was drilled for unknown purposes to a depth of 186 metres BGL. The standing water level at this site was recorded at 90 meters BGL.

A search of the Australian Bureau of Meteorology Groundwater Dependent Ecosystem Atlas on 2 October 2020 did not return any results for any aquatic, terrestrial or subterranean groundwater dependent ecosystems (GDEs) at the site.

Flood

Flood liable land is categorised according to the levels of potential flood risk. No public Flood Risk Precinct maps are available from the Upper Parramatta River Catchment Floodplain Risk Management Study and Plan. The City of Parramatta Council FloodSmart portal was used to identify the flood risk extents relative to the Proposal location. Mapping on the FloodSmart portal characterises flood risk as a function of flood frequency and flood severity.

Mapping showed that the site is not expected to be at risk of flooding from Darling Mills Creek in the one percent annual exceedance probability (AEP).

The portal was unable to provide site specific information on localised flooding, however such assessment would be conducted during detailed design.

6.9.2 Potential impacts

a) Construction phase

Surface water and water quality

Excavation and earthworks for the installation of the car park terraces and associated retaining walls during the construction phase have the potential to impact on local waterways due to the increased erosion and sedimentation from exposed soil and stockpiles.

Additionally, fuels, chemicals and wastewater from accidental spills during construction could potentially enter stormwater drains and flow into nearby waterways. However, standard mitigation measures would be implemented during construction to minimise this risk.

The existing stormwater and surface water regime would not be impacted by any construction works undertaken at the ancillary works areas, if required.

Groundwater

The majority of excavations and earthworks would occur on the existing large area of fill and as such, it is unlikely that excavation works would impact upon groundwater. However, the installation of the on-site stormwater detention tank would require excavation of land at the south-western area of the site. As there is no consistency between the depth to groundwater of the identified bores closest to the Proposal, the depth to groundwater within the Proposal site remains uncertain. Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* and Transport for NSW's *Water Discharge and Reuse Guideline.*

The removal of trees on the Proposal site could potentially have a minor impact on the groundwater levels on the site. However, a majority of the vegetated area would be replaced by hardstand which would reduce direct infiltration of water into the soil.

Flood

The Proposal is not located within an area prone to flooding which would be impacted by the one per cent AEP.

Localised flooding is not anticipated however initial construction works include the installation of drainage and on-site detention basin and would contain any potential localised flooding.

b) Operational phase

Surface water and water quality

Two design solutions for surface and stormwater were considered during concept design and involve either the discharge of stormwater through the existing overland flow path located at the north-west corner of the site, or connection of the stormwater to Council stormwater infrastructure. Both options provide suitable drainage solutions however would be determined during detailed design. For the purposes of this REF both options have been assessed below.

The first option from the preliminary assessment of the site undertaken by FutureRail proposes that the stormwater point of discharge would be in the north-western corner of the site and would follow an existing overland flow path connecting downstream to Darling Mills Creek. This overland flow path is currently utilised by the site under existing conditions, and as such, the proposed point of discharge would follow the existing arrangement. However, as a result of the Proposal, the site ground surface would change to include additional large impervious areas. To account for this change, the on-site stormwater detention tank capacity would be designed to ensure that pre-development flow rates are maintained. This measure would ensure that no additional stormwater would enter the M2 Hills Motorway corridor and flows from the site would be sufficiently managed.

An alternative design option includes the stormwater discharge point for the Proposal would be into the existing Council drainage system on Perry Street. Limited information regarding the condition and capacity of the drainage system is available at this stage of design. A site investigation would be undertaken during detailed design to determine the levels and sizes of the existing road drainage system infrastructure. Typically, the Council drainage is designed for minor storm events (2-10 per cent AEP), and therefore the capacity of the system to manage additional stormwater as a result of the Proposal may be limited and would require further consideration during detailed design. Using on-site stormwater detention measures would maintain acceptable outflow rate to Council stormwater infrastructure. This flow rate would be determined during detailed design, in consultation with Council.

Under either design option, stormwater from the Proposal would collect contaminants such as heavy metals or fuel left by vehicles using the car park, which could potentially be conveyed to nearby waterways. A proposed measure to mitigate this impact would be to redirect the stormwater captured through systems before discharging into nearby waterways. Such a stormwater quality improvement system would be determined during detailed design.

Stormwater drainage infrastructure would be designed to accommodate a 20-year Annual Recurrence Interval (ARI) for piped systems and the 100-year ARI storm event to be conveyed in formalised overland flow paths, in accordance with the relevant Transport for NSW, Sydney Water and City of Parramatta Council standards and requirements. The implementation of these standards and recommendations is expected to ensure that the works do not adversely impact upon Council's drainage infrastructure.

The existing stormwater and overland flow path regime would be maintained at the ancillary works areas during operation of the Proposal.

Groundwater

The Proposal is not anticipated to have impacts on groundwater within the Proposal area during the operation phase.

Flood

The Proposal is not located within or adjacent to a flood prone area greater than one per cent AEP and larger event. Therefore, flooding of the site by nearby waterbodies would be negligible and would therefore not impact on operational activities.

Localised flooding of the site during the operation phase could impact on the safety of the Proposal for commuters and adjacent residents. The design criteria would include a drainage system to address any localised flooding impacts and would be confirmed during detailed design.

6.9.3 Mitigation measures

During detailed design the stormwater drainage infrastructure would be designed to accommodate a 20-year ARI for piped systems and the 100-year ARI storm event to be conveyed in formalised overland flow paths. The potential impacts of climate change on flooding shall be considered to ensure safe access and infrastructure is maintained.

The CEMP would contain mitigation measures to manage erosion and sediment control. Erosion risks would be managed through the implementation of standard measures as outlined in the *'Blue Book' – Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) in conjunction with the CEMP and Erosion and Sediment Control Plan to ensure suitable erosion control measures are put in place and maintained correctly during construction of the Proposal.

Refer to Table 7-1 and Chapter 7 for a list of proposed mitigation measures.

6.10 Air quality

6.10.1 Existing environment

Regional air quality

NSW Department of Planning, Industry and Environment (DPIE) undertakes air quality monitoring across NSW for key air pollutants, include ozone (O_3). nitrogen dioxide (NO_2), carbon monoxide (CO), sulphur dioxide (SO_2) and particulates less than 10 micrometres in diameter (PM_{10}). These key pollutants are measured on the Air Quality Index scale, as depicted in Figure 6-21.

Air Quality Index (AQI)	Colour indicator	What does it mean?
0-33	Very good	Enjoy normal activities.
34-66	Good	Enjoy normal activities.
67-99	Fair	People unusually senstive to air pollution should reduce or reschedule strenuous outdoor activities. Others are are not likely to be affected when the AQI is in this range.
100-149	Poor	Sensitive groups should reduce or reschedule strenuous outdoor activities. Other adults are not likely to be affected when the AQI is in this range.
150-199	Very poor	Sensitive groups should avoid strenuous outdoor activities. Other adults should reduce or reschedule strenous outdoor activities.
200+	Hazardous	Sensitive groups should avoid all outdoor activities. Other adults should avoid strenous outdoor activities.

Figure 6-21 Air Quality Index scale and activity guide (Source: Health NSW, 2020)

The Proposal site is located within the Sydney North-west monitoring region with air quality monitored at fixed sites. Parramatta North is the closest monitoring site to the Proposal. A search of the daily regional air quality index for the Parramatta North area for the last year (October 2019 to October 2020) showed that the region generally experienced 'Fair' and 'Good' air quality values, with some outlying values of 'Very Poor' and 'Hazardous'. Very poor and hazardous air quality was recorded during November 2019 to February 2020 during the 2019/20 bushfire season and is representative of widespread smoke from bushfires during this period.

Air pollutant sources

A search of the National Pollutant Inventory database (NPI) for 2018/19 data within North Rocks and surrounding suburbs indicates that there are two facilities that are monitored for air quality. These are both located around 1100 metres from the Proposal site and include:

- Spotless Facility Services North Rocks
- Unilever North Rocks.

Other sources of localised air pollution within proximity of the Proposal are likely to be car and truck exhaust fumes from the adjacent M2 Hills Motorway.

Sensitive receivers

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

- local residents
- users of adjacent private recreation areas
- pedestrians and commuters within the local area.

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 the selection of materials.

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 also be associated with a number of stationary and mobile sources as well as potential wind erosion of exposed soil.

Anticipated sources of dust and dust generating activities include:

- loading and transfer of materials from trucks
- stockpiling activities
- earthworks and excavation and preparation of terraces, tree removal, drainage works and road works
- general construction works
- Emissions of CO, NO_x, SO_2, PM_{10}, VOCs and PAH compounds associated with the combustion of diesel fuel and petrol from construction plant and equipment.

The operation of plant, machinery and trucks may also lead to increases in exhaust emissions in the local area, however, these impacts are anticipated to be minor and short-term.

The total amount of dust generated would depend on the properties of the soil material (silt and moisture content), the activities undertaken and prevailing meteorological conditions. Cutting and grading of the site would involve extensive excavation. The likely airborne dust load generated during the enabling earthworks and excavations would be moderate and has the possibility to result in reduced local air quality at the nearest potentially affected receptors. Appropriate measures would be established to manage dust emissions from demolition works.

b) Operational phase

It is estimated that during operation, the Proposal would generate 40 inbound movements during the morning peak hour and 34 outbound trips during the evening peak hour. This additional provision of parking spaces would increase the number of vehicles operating within the immediate vicinity of the Proposal, however many of these vehicles already travel to the area and park either in the existing nearby commuter car park or on the surrounding streets. Increased patronage of the public transport system would likely result in a relative reduction of commuter vehicle movements on roads, particularly the adjacent M2 Hills Motorway, with corresponding relative reduction in vehicle emissions in the long term, which would have some beneficial effects on local air quality.

Overall impacts of air quality during the operation of the Proposal are considered minimal. The provision of additional parking spaces would 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.

Furthermore, provision of cable containment to facilitate the future installation of electric vehicle charging equipment and cabling for up to 15 per cent of the total car spaces would be provided and would provide future opportunity for reduced greenhouse gas production.

Renewable energy options, would be investigated during detailed design and would also minimise the Proposal's contribution to greenhouse gas production.

6.10.3 Mitigation measures

Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's *Air Quality Management Guideline* (Transport for NSW, 2019k). The following mitigation measures would be implemented:

- turn machinery off rather than left to idle when they are not in use
- maintain vehicles to manufacturer's standards
- cover stockpiles with geofabric or equivalent
- use watercarts during high wind weather events and dry conditions.

Refer to Table 7-1 in Section 7.2 for a list of proposed mitigation measures.

6.11 Waste

No waste is generated on the Proposal site as it is currently a greenfield site.

During construction of the Proposal, the following waste materials would be generated:

- excavated soil, sediment and rock
- mulched native and exotic vegetation, including weeds
- surplus building materials
- building wastes, including metals, timbers, plastics, concrete, packaging
- 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. Much of the construction waste and demolition waste would aim to be diverted from landfill. All usable spoil would be beneficially reused on site, where possible. Waste generated on site would be recycled, where possible or otherwise disposed on in accordance with EPA guidelines.

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 to identify all potential waste streams associated with the work and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities along with other onsite management practices such as keeping the area tidy and free of rubbish.

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

6.12 Bushfire risk

6.12.1 Existing environment

Bushfire prone land, as identified on *NSW Bush Fire Prone Land* map (NSW Rural Fire Service, 2020) has three categories:

- 'Vegetation Category 1', which is the most hazardous vegetation category, generally refers to forest, woodlands, heaths (tall and short), forested wetlands and timber plantations.
- 'Vegetation Category 2' refers to vegetated areas such as moist forests, shrublands, open woodlands, grasslands, and is considered less at risk than category 1 land.

- ‘Vegetation Category 3’ consists of grasslands, freshwater wetlands, semi-arid woodlands, alpine and arid shrublands.
- ‘Vegetation Buffer’ is area created based on bushfire vegetation, with buffering distance being 100 metres for Vegetation Category 1 and 30 metres for Vegetation Category 2 and 3.

The south west corner of the Proposal site is mapped as ‘Vegetation Buffer’ and is adjacent to ‘Vegetation Category 1’ land (Figure 6-22).

Figure 6-22 Bushfire Prone Land map (Source: NSW Rural Fire Service, 2020)

6.12.2 Potential impacts

a) Construction phase

Construction activities that may increase the risk of bushfire include:

- site preparation activities, such as mowing, slashing and the use of power tools
- undertaking 'hot works' (i.e. use of oxy acetylene equipment, and welding equipment)
- operating a petrol, liquefied petroleum gas or diesel-powered vehicles or plants near land containing combustible material
- operating plant fitted with power hydraulics on land containing combustible material
- storage of fuel.

High risk activities would be undertaken with care or avoided where possible during high risk bushfire weather.

b) Operation phase

The majority of existing vegetation on site would be removed for the purpose of constructing the at-grade commuter car park. There would be some minor landscaping following construction.

It is considered that the M2 Hills Motorway may act as a physical barrier between the 'Vegetation Category 1' located to the west of the site, preventing bushfires from affecting the Buffer area located within the site boundary.

The Proposal would be unlikely to increase bushfire risk in the vicinity of the site.

6.12.3 Mitigation measures

Mitigation measures would be incorporated into the CEMP to minimise risk of bushfire from construction activities.

6.13 Sustainability

The design of the Proposal would be based on the principles of sustainability, including the incorporation of the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2019a) and the Transport for NSW *Environmental Management System* (EMS). These guidelines require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.3.3 for more information regarding the application of these guidelines.

Detailed design would include the provision of sufficient cable containment to facilitate the future installation of electric vehicle charging equipment and cabling for up to 15 per cent of the total number of car spaces included in the Proposal. This future installation would be undertaken by the operators of the car park.

Construction waste and demolition waste would aim to be diverted from landfill, and all usable spoil would be beneficially reused on site, where practicable. Water consumption during construction would be monitored and reported on and consumption of portable water would be reduced, where possible.

Materials to be used in the construction of the car park would be selected carefully. Consideration would be given to life cycle impacts which are calculated by assessing the environmental impacts of materials from the point of extraction, through to transportation, use, operation and end of life.

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

6.14 Climate change

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

Climate change could lead to an increase in the intensity of rainfall events, whereby the rainfall excepted to occur in a 100-year average recurrence interval flood event would occur more frequently. The potential changes to rainfall and flooding are outlined in Section 6.9.

Climate change could lead to an increase in frequency and severity in bushfires. The Proposal is partially situated on land mapped as a bush fire buffer zone, but would be designed with appropriate fire protection measures, as outlined in Section 6.12.

The detailed design would consider the impacts of climate change on the Proposal through:

- selection of materials for durability in extreme conditions and that minimise heat retention
- incorporate fire resistant/retarding materials wherever practicable
- incorporate engineering and design features to ensure structures are constructed to minimise direct impacts from severe storms and strong winds.

6.15 Greenhouse gas emissions

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

The detailed design process would undertake a compliant carbon footprint exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (TfNSW, 2019c) or other approved modelling tools. The carbon footprint would to 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 7-1.

It is anticipated that, once operational, the Proposal may result in an increase in use of public transport and a relative decrease in use of private motor vehicles by commuters to travel to and from North Rocks. A modal shift in transport usage may reduce the amount of fuel consumed by private motor vehicles with a corresponding relative reduction in associated greenhouse gas emissions in the local area.

6.16 Other impacts

6.16.1 Utilities

A number of utilities have been identified on the site during a site inspection on 23 September 2020, including aerial electrical wiring along Perry Street, a stormwater culvert located on the south-west end of the site, a pad-mounted transformer and two electrical poles located along the south eastern boundary.

A preliminary Dial Before You Dig search was undertaken by FutureRail which identified a number of utilities on the site in the Utility Impact Register and summarised below in Table 6-20 (FutureRail, 2020d).

All utility locations featured in the register are indicative only and a qualified plant locator would be engaged in subsequent design stages to obtain detailed site survey and utility locations. Asset owners would be contacted during detailed design to discuss asset relocation and specific impact mitigation measures that may be required for the Proposal.

The Proposal has been designed to avoid relocation of services where feasible, however it is likely some services may require relocation, including aerial electrical wire and street lighting, but such relocation is unlikely to occur outside of the footprint of the works assessed in this REF. In the event that works would be required outside of this footprint, further assessment would be undertaken.

Any relocation of utilities on the site prior to construction activities would be subject to detailed design.

All lighting on the site would require connection to mains power and may require shallow trenching to allow for connection from lighting poles to the pad-mounted transformer. For impacts regarding sedimentation impacts from trenching activities, refer to Section 6.9.

Table 6-20 Utility Impact Register (Source: FutureRail, 2020d)

Location description	Utility ID	Asset owner	Utility type	Utility size	Utility material	Quality level	Action	Reason
Perry Street	SW01	Sydney Water	Sewer Main	DN150	VC	D	Retain	If depth is adequate, asset should be able to be retained. Will depend on construction methodology.
Perry Street	SW01	Sydney Water	Water Main	DN150	CICL	D	Retain	If depth is adequate, asset should be able to be retained. Will depend on construction methodology.
Perry Street	NBN01	NBN/Telstra	Optic Fibre	DN100	PVC	D	Retain	If depth is adequate, asset should be able to be retained. Will depend on construction methodology.
Perry Street	EE01	Endeavour Energy	Aerial electrical wire and street lighting	Unknown	Unknown	D	Relocate	Relocation dependant on construction methodology. May have to be temporarily propped/removed to allow construction.

6.17 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 DPIE Major Projects Register and Sydney Central City Planning Panel Development and Planning Register, on 8 October 2020 and City of Parramatta Council Development Application Register on 21 October identified the following major development applications listed in proximity to the Proposal:

- DPIE Major Projects Register
    - Sydney Metro West – major rail project to service Westmead, Greater Parramatta, Sydney Olympic Park, The Bays Precinct and Sydney CBD – currently being assessed by DPIE
- Sydney Central City Planning Panel Development and Planning Register
    - 4 James Street Baulkham Hills – Demolition of existing structures and construction of a childcare centre – located around 1800 metres from the Proposal site – Under assessment
    - 5A Fleet Street North Parramatta – Alterations and additions – located around 4000 metres from the Proposal site – Under assessment
- City of Parramatta Council Development Application Register
    - North Rocks Shopping Centre – Extension of the centre, including a new supermarket, basement and rooftop car park, relocation of a swim school, new mall area and new tenancies – A number of DAs associated with this extension have been approved with a number still under assessment
    - 40 Barclay Road, North Rocks – Tree Application – Lodged (not yet assessed)
    - 48 Plymouth Avenue, North Rocks – Tree Application, removal of one tree – Under assessment
    - 25 Williams Road, North Rocks – Tree Application, removal of one tree – Under assessment.

During construction, the works would be coordinated with any other construction activities in the area. Consultation and liaison would occur with the City of Parramatta Council 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, as outlined in Section 6.1.

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.

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 Transport for NSW'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 but not be limited to the following key sub plans:

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

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 7-1. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 7-1 Proposed mitigation measures

No.	Mitigation measure
	General
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Contractor in accordance with the relevant requirements of *Environmental Management Plan Guideline – Guideline for Infrastructure Projects,* NSW Department of Planning, Industry and Environment, 2020) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the 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 Transport for NSW's *Guide to Environmental Controls Map* (TfNSW, 2019d) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.

No.	Mitigation measure
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.
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.
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by Transport for NSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.
	Traffic and site access
8.	Prior to the commencement of construction, a Traffic Management Plan (TMP) would be prepared as part of the CEMP and would include at a minimum: • ensuring adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised • maximising safety and accessibility for pedestrians and cyclists • ensuring adequate sight lines to allow for safe entry and exit from the site • ensuring access to the M2 Barclay Road Bus Interchange, businesses, 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 would be monitored for compliance • construction workers to be encouraged to access the site via public transport, where practical • 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. 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.
9.	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.
	Urban design, landscape and visual amenity

No.	Mitigation measure
10.	An Urban Design and Landscape Plan (UDLP) would be prepared, in consultation with the City of Parramatta Council, and submitted to Transport for NSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The UDLP, at a minimum, would address the following: • a Public Domain Plan and Urban Design Landscape Plan would be prepared which includes replacement planting to address vegetation removed during construction and general landscaping requirements • 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 trees, entries, vehicle cross overs ○ 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.
11.	A lighting scheme for the construction and operation of the Project is to be developed by a suitably qualified lighting designer and prepared in accordance with *AS 1158 Lighting for Roads and Public Spaces* and *AS 4282 Control of the Obtrusive Effects of Outdoor Lighting*. The lighting scheme shall address the following as relevant: a) consideration of lighting demands of different areas b) strategic placement of lighting fixtures to maximise ground coverage c) use of LED lighting d) minimising light spill by directing lighting into the car park e) control systems for lighting that dim or switch-off lights settings according to the amount of daylight the zone is receiving f) motion sensors to control low traffic areas g) consideration of reducing vehicle headlights shining into neighbouring properties h) allowing the lighting system to use low light or switch off light settings while meeting relevant lighting Standards requirements, and i) ensuring security and warning lighting is not directed at neighbouring properties. The proposed lighting scheme is to be submitted to TfNSW's technical (design) team for acceptance.
12.	The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.
13.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
14.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
15.	During construction, graffiti would be removed in accordance with Transport for NSW's Standard Requirements.

No.	Mitigation measure
	Noise and vibration
16.	Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (TfNSW, 2019b) and the Noise and Vibration Impact Assessment for the Proposal (Acoustic Studio, 2020). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
17.	The CNVMP would outline measures to reduce the noise and vibration impacts from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include: • brief project staff and workers on the noise sensitivity of the neighbouring properties to the site and regularly training workers and contractors on the importance of minimising noise emissions and how to use equipment in ways to minimise noise • maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances • avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable • using the most suitable equipment necessary for the construction works at any one time and modify methods of construction, where feasible • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site • 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 • switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded • ensuring spoil is placed and not dropped into awaiting trucks • avoiding deliveries at night/evenings wherever practicable • avoid unnecessary idling of trucks and equipment • avoid the use of tracked vehicles on site, where practicable • limit the number of trucks on site at the commencement of site activities to the minimum required by the loading facilities on site • avoid the use of vibratory rollers and large excavators • 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.
18.	Works would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any works outside these hours may be undertaken if approved by Transport for NSW 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 Transport for NSW Environment and Planning Manager for any works outside normal hours.

No.	Mitigation measure
19.	As per the *Construction Noise and Vibration Strategy* (TfNSW, 2019b), construction activities with special audible characteristics (high noise impact, intensive vibration, impulsive or tonal noise emissions) would be limited to standard hours, starting no earlier than 8am; and to continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block, unless otherwise approved by Transport for NSW.
20.	Work would be conducted behind temporary hoardings/screens wherever practicable. The installation of construction hoarding would take into consideration the location of residential receivers to ensure that 'line of sight' is broken, where feasible.
21.	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 (Acoustic Studio, 2020) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
22.	Vibration (other than from blasting) resulting from construction and received at any structure outside of the project would be managed in accordance with: • for structural damage vibration – British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings Part 2 and German Standard DIN 4150:Part 3 – 1999: Structural Vibration in Buildings: Effects on Structures • For human exposure to vibration the acceptable vibration – values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS 6472-2:1992 *Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).*
23.	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).
24.	The installation of a solid fence in addition to, or in replacement of, the existing mesh fence at the boundary of 1 and 3 Perry Street should be considered during detailed design to mitigate operational noise impacts to these sensitive receivers.
25.	Information would be provided to neighbours before and during construction periods. Good communication would be maintained and documentation of complaints would be kept. Complaints would be responded to quickly and all reasonable and feasible measures would be implemented to address the source of the complaint.
26.	Noisy activities would be scheduled outside of the most sensitive times of the day for each nominated receiver as far as practicable.
27.	The Contractor would undertake environmental noise monitoring at 1 and/or 3 Perry Street boundaries to verify the noise impacts during construction to be reviewed and further action taken or refinement of mitigation measures and CNVMP as relevant. Further monitoring is to be reviewed after this time or sooner should it be deemed necessary by the acoustic consultant and the Project Manager. This is to take place mainly at the above locations although other locations and plant and equipment monitoring are to take place as and when necessary. If results indicate vibration levels exceeding allowable limits appropriate action is to be taken.

No.	Mitigation measure
28.	A vibration monitoring system is to be implemented if required. This system would monitor vibration levels when there is potential for them to change. This could happen in various situations, such as, changes in equipment and activities or changes to work procedures that might affect existing vibration control measures. The monitoring procedure would be carried out with appropriate equipment so that results obtained are readily comparable with results obtained earlier. If results indicate vibration levels exceeding allowable limits appropriate action is to be taken.
	Indigenous heritage
29.	All construction staff would undergo an induction in the recognition of Indigenous cultural heritage material. This training would include information such as the importance of Indigenous cultural heritage material and places to the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites.
30.	If unforseen Indigenous objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2019e) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the TfNSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Heritage NSW and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and Heritage NSW notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location.
	Non-Indigenous heritage
31.	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.
32.	In the event that any unanticipated archaeological deposits are identified within the project site during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2019e) would be followed, and works within the vicinity of the find would cease immediately. The Contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and Heritage NSW. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.
	Socio-economic
33.	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.
34.	Feedback through the consultation process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
35.	A Community Liaison Management Plan would be prepared prior to construction to identify all potential stakeholders and best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where practicable.

No.	Mitigation measure
36.	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.
37.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed prior to construction.
	Biodiversity
38.	Construction of the Proposal must be undertaken in accordance with Transport for NSW's *Vegetation Management (Protection and Removal) Guideline* (TfNSW, 2019f) and Transport for NSW's *Fauna Management Guideline* (TfNSW, 2019g).
39.	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.
40.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees nominated to be removed in the EAR (Cardno, 2020) 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.
41.	Tree Protection Zones (TPZs) would be determined by a qualified arborist and established around trees to be retained. Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs.
42.	In the event of any tree to be retained becoming damaged during construction, the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
43.	Should the detailed design or onsite works determine the need to remove or trim any additional trees, which have not been identified in the REF, the Contractor would be required to complete TfNSW's Tree Removal Application Form and submit it to TfNSW for approval.
44.	For new landscaping works, mulching and watering would be undertaken until plants are established.
45.	Weed control measures, consistent with Transport for NSW's *Weed Management and Disposal Guideline* (TfNSW, 2019h), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the *Biosecurity Act 2015.*
46.	The drain line is to be fenced off, sedimentation controls implemented and labelled as No-Go areas to prevent accidental indirect impacts downhill into Darling Mills Creek and introduction of pathogens, such as *Batrachonchtrium dendrobatidis*, a pathogen that caused chytridiomycosis, an infection disease on amphibians.
47.	All machinery would be cleaned of foreign soil and vegetative matter to avoid the spread of *Phytophthora cinnamomi*, Exotic Rust Fungi of the order *Pucciniales pathogenic* (Myrtle Rust) and dispersal of seeds of non-native plants into remnant native vegetation to be retained within the Proposal site and into native vegetation adjacent to the Study Area.

No.	Mitigation measure
48.	Strict weed management, monitoring and control practices should be implemented as part of the CEMP to minimise the spread of exotic species into natural areas within and outside of the Study Area. In particular, priority weeds, high threat weeds and WoNS species should be targeted in accordance with the NSW DPI WeedWise recommended control measures (DPI 2020).
49.	Stockpiling of materials should occur within previously disturbed areas and not within driplines or retained vegetation.
50.	Felled trees and logs are to be salvaged. Salvaged strategy and translocation areas to be defined in a felled tree and log salvage protocol would be detailed in the CEMP.
51.	Establishment of landscaped area or offset site to offset loss of native vegetation.
52.	Stop-work procedure on the chance encounter of any dispersing wildlife during works should be implemented to avoid death or injury.
53.	Ensure that a suitably qualified ecologist is present during the removal of all trees to act as a spotter-catcher that can relocate any captured wildlife.
54.	Ensure that all captured animals are relocated into the nearest suitable native vegetation.
55.	Ensure that all injured animals are taken to a local wildlife carer for treatment.
	Soils and water
56.	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.
57.	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.
58.	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.
59.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and Transport for NSW's *Chemical Storage and Spill Response Guidelines* (TfNSW, 2019i).
60.	Adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) would be implemented in accordance with relevant EPA guidelines and the Transport for NSW *Chemical Storage and Spill Response Guidelines* (TfNSW, 2019i) 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.
61.	In the event of a pollution incident, works would cease in the immediate vicinity and the Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the POEO Act.

No.	Mitigation measure
62.	The existing drainage systems would remain operational throughout the construction phase.
63.	Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and Transport for NSW's *Water Discharge and Reuse Guideline* (TfNSW, 2019j).
64.	Strict erosion and sedimentation control measures should be implemented where required to ensure that the water quality and hydrological regime of Darling Mills Creek located off-site and within the vicinity of the site is not indirectly impacted.
65.	Implement dust control measures where necessary to protect adjacent retained vegetation and water offsite towards Darling Mills Creek.
	Air quality
66.	Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's *Air Quality Management Guideline* (TfNSW, 2019k).
67.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
68.	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.
69.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
70.	To minimise the generation of dust from construction activities, the following measures would be implemented: • apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) • cover stockpiles when not in use • appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading • prevent mud and dirt being tracked onto sealed road surfaces.
	Waste and contamination
71.	The CEMP (or separate Waste Management Plan, if necessary) must address waste management and would at a minimum: • identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data.
72.	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.

No.	Mitigation measure
73.	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.
74.	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal.
75.	Any concrete washout would be established and maintained in accordance with Transport for NSW's *Concrete Washout Guideline* – draft (TfNSW, 2019l) with details included in the CEMP and location marked on the ECM.
76.	Detailed contamination testing would be undertaken during Detailed Design to confirm the risks of contamination on the site.
	Sustainability, climate change and greenhouse gases
77.	Detailed design of the Proposal would be undertaken in accordance with the *NSW Sustainable Design Guidelines – Version 4.0* (TfNSW, 2019a).
78.	The detailed design process would undertake a compliant carbon footprinting exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (Transport for NSW, 2019c) or other approved modelling tools. The carbon footprint would to be used to inform decision making in design and construction.
79.	The detailed design process would undertake a climate change impact assessment with reference to the Climate Change Impacts and Risk Management: A Guide for Business and Government (Department of the Environment and Heritage, 2006 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.
	Utilities
80.	An appropriately qualified plant locator would be engaged during detailed design to obtain a detailed site survey and locate utilities on the site. Location identification would be made in accordance with asset owner policy.
	Cumulative impacts
81.	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.

8 Conclusion

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

The Proposal would provide the following benefits:

- additional commuter parking in close proximity to the M2 Barclay Road Bus Interchange, facilitating improved opportunities to change modes of transport
- increasing accessibility and convenience to and from the M2 Barclay Road Bus Interchange, potentially increasing the use of public transport and encouraging a mode shift away from private vehicles
- improved customer experience by providing modern car parking facilities with security features including lighting and closed circuit television cameras
- reduction in the need for commuters to park in local residential streets, potentially improving traffic and road safety.

The likely key impacts of the Proposal are as follows:

- a minor increase in local traffic movements during operation of the Proposal
- the Proposal would result in a noticeable visual change and greater views to the site through the removal of trees and removal of the grassed mound, however this visual impact is mitigated by a highly limited visual catchment and proposed landscaping features
- an area of up to 0.057 ha, including native trees, would likely be cleared, resulting in localised impacts to a small area of native vegetation and fauna habitat in the western corner of the site. Loss of vegetation within the Proposal site would be offset in accordance with the *Vegetation Offset Guide* (Transport for NSW, 2019m)
- temporary visual, noise and vibration impacts during the construction period.

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

The Proposal would also take into account the principles of ESD and sustainability (refer to Section 3.3.3 and Section 4.3). 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.

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Appendix A Consideration of matters of National Environmental Significance

The table below demonstrates Transport for NSW's consideration of the matters of 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
Any impact on a World Heritage property? There are no World Heritage properties within 1km of the Proposal.	Nil
Any impact on a National Heritage place? There are no National Heritage places within 1km of the Proposal.	Nil.
Any impact on a wetland of international importance? There are no wetlands of international importance within 1km of the Proposal.	Nil.
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 (see Section 6.7).	Nil.
Any impacts on listed migratory species? It is unlikely that the development of the Proposal would significantly affect any listed migratory species.	Nil.
Does the Proposal involve a nuclear action (including uranium mining)? The Proposal does not involve a nuclear action.	Nil.
Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the vicinity of the Proposal.	Nil.
Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? The Proposal does not involve development of coal seam gas or a large coal mine.	Nil.
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be undertaken on or near any Commonwealth land.	Nil.

Appendix B Consideration of clause 228

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

Factor	Impacts
(a) Any environmental impact on a community? There would be some temporary impacts to the community during construction, particularly in relation to noise, traffic, access and visual amenity. Mitigation measures outlined in Chapter 7 would be implemented to manage and minimise adverse impacts.	Minor.
(b) Any transformation of a locality? The Proposal would include the introduction of new visible elements in the landscape through the construction of a new at-grade car park. Vegetation removal would be required to facilitate the development of the Proposal. The Proposal would have a positive contribution to the locality by helping to address the high demand for commuter car parking spaces. The Proposal also provides infrastructure that supports potential growth and provides improved public transport facilities.	Minor.
(c) Any environmental impact on the ecosystem of the locality? Due to the removal of vegetation and trees within the Proposal site, the Proposal would have a minor impact on the local ecosystem as discussed in Section 6.7. Vegetation removal would be subject to offsetting in accordance with the Transport for NSW *Vegetation Offset Guide* (Transport for NSW, 2019m).	Minor.
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? Some short-term impacts during construction are anticipated, particularly in relation to noise, traffic and access and visual amenity. There would be some minor impacts to visual amenity, in particular for residents in the vicinity. During operation, the Proposal would have positive impacts to the community through providing a modern at-grade car park with improved access, lighting and safety measures.	Minor.
(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? The Proposal site is not located in close proximity to registered heritage items and Aboriginal Heritage items are unlikely to be harmed by the Proposal. The visual impacts from the Proposal are anticipated to be moderately low. A landscape and visual impact assessment was completed by a specialist and is summarised in Section 6.2.	Minor.

Factor	Impacts
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The impact on the habitat of protected fauna is likely to be low, as identified in Section 6.7. 5 mature trees and native vegetation is likely to be removed during the site enabling activities during the construction phase of the Proposal.	Minor.
(g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air? The Proposal is unlikely to endanger species as identified in Section 6.7. 5 mature trees and native vegetation is likely to be removed during the site enabling activities during the construction phase of the Proposal. Vegetation removal would be subject to offsetting in accordance with the Transport for NSW *Vegetation Offset Guide* (Transport for NSW, 2019m).	Nil.
(h) Any long-term effects on the environment? The Proposal is unlikely to have any long-term effects on the environment.	Nil.
(i) Any degradation of the quality of the environment? The Proposal would result in the removal of vegetation and bulk earthworks. Impacts from the Proposal would be minimised by the implementation of mitigation measures identified in Section 7.	Minor.
(j) Any risk to the safety of the environment? 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 recommended mitigation measures are implemented.	Minor.
(k) Any reduction in the range of beneficial uses of the environment? The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.	Nil.
(l) Any pollution of the environment? The Proposal is unlikely to cause any pollution to the environment provided the recommended mitigation measures are implemented.	Minor.
(m) Any environmental problems associated with the disposal of waste? The Proposal is unlikely to cause any environmental problems associated the disposal of waste. All waste would be managed and disposed of in accordance with the *EPA Waste Classification Guidelines* (EPA, 2014). Mitigation measures would be implemented to ensure waste is reduced, reused or recycled, where practicable.	Nil.
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Proposal is unlikely to increase demands on resources that are or are likely to become in short supply.	Nil.

Factor	Impacts
(o) Any cumulative environmental effect with other existing or likely future activities? The cumulative effects of the Proposal are described in Section 6.17. Where feasible, environmental management measures would be co-ordinated to reduce any cumulative construction impacts. The Proposal is unlikely to have any significant adverse long-term impacts.	Nil.