Transport for NSW

Edmondson Park Station (North) Commuter Car Park Program

Review of Environmental Factors

NSW GOVERNMENT

Artist's impression of the proposed northern entry of Edmondson Park Station (North) Commuter Car Park looking east, subject to detailed design

May 2022

Edmondson Park Station (North) Commuter Car Park

Review of Environmental Factors

Commuter Car Park Program
Ref – 6668973

Contents

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Abbreviations

Term	Meaning
AHIMS	Aboriginal Heritage Information Management System
AS	Australian Standard
ASS	Acid Sulfate Soils
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CCTV	Closed circuit television
CLM Act	*Contaminated Land Management Act 1997* (NSW)
CLMP	Community Liaison Management Plan
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
DAWE	Department of Agriculture, Water and the Environment (Aust.)
DBH	Diameter Breast Height
DoE	Department of the Environment (Aust.)
DPE	NSW Department of Planning and Environment
DPIE	(former) NSW Department of Planning, Industry and Environment
ECM	Environmental Controls Map
EES Group	Environment, Energy and Science Group in the Department of Planning, Industry and Environment
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2021* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
ESD	Ecologically Sustainable Development (refer to Definitions)
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009).

Term	Meaning
Transport and **Infrastructure SEPP**	*State Environmental Planning Policy (Transport and Infrastructure) 2021* (NSW)
LEP	Local Environmental Plan
LGA	Local Government Area
MCA	Multi-criteria analysis
NES	National Environmental Significance (refers to matters of National Environmental Significance under the EPBC Act)
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	(former) Office of Environment and Heritage
PDP	Public Domain Plan
PoEO Act	*Protection of the Environment Operations Act 1997* (NSW)
REF	Review of Environmental Factors (this document)
Roads Act	*Roads Act 1993* (NSW)
SEPP	State Environmental Planning Policy
SHI	State Heritage Inventory
SHR	State Heritage Register
SREP	Sydney Regional Environmental Plan
SWRL	South West Rail Link
TAHE	Transport Asset Holding Entity of NSW
TfNSW	Transport for New South Wales
TPZ	Tree Protection Zone
Transport for NSW	Transport for New South Wales
TTIA	Traffic and Transport Impact Assessment
UDP	Urban Design Plan
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
WM Act	*Water Management Act 2000* (NSW)

Definitions

Term	Meaning
Average Exceedance Probability	The likelihood of occurrence, expressed in terms of percentage, of a flood event occurring. For example, a one per cent Annual Exceedance Probability flood is a flood event that has a one per cent chance of occurring, or being exceeded, in any one year.
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the Construction Contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
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 Construction Contractor. The Construction 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 Construction Contractor is therefore responsible for all work on the project, both design and construction.
Determining Authority	A Minister or public authority on whose behalf an activity is to be carried out or public authority whose approval is required to carry out an activity (under the EP&A Act).
Disability Standards for Accessible Public Transport	The Commonwealth *Disability Standards for Accessible Public Transport 2002* (as amended) are a set of legally enforceable standards, authorised under the Commonwealth *Disability Discrimination Act 1992* for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Ecologically Sustainable Development	As defined by section 193 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.
First mile / last mile	The first and final stage of a journey in which people or goods travel to a broad range of origins or destinations.
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.
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).
Park&Ride	A scheme operated by TfNSW, which provides free car parking to a person parking in a dedicated Transport Park&Ride car park for up to 18 hours when completing a public transport journey by tapping on and off using an accepted Opal card, and then using that Opal card when exiting the car park.
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act.

Term	Meaning
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.
The Proposal	The construction and operation of the Edmondson Park Station (North) Commuter Car Park.
TAHE	Transport Asset Holding Entity of NSW
Vegetation Offset Guide (Transport for NSW, 2019)	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 offset strategies including 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 is proposing to undertake the Edmondson Park Station (North) 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.

The Proposal would aim to provide a multi-storey commuter car park on a vacant site, off Soldiers Parade, to the north-west of Edmondson Park Station.

The Proposal would include the following key components:

- construction and operation of a multi-storey car park, consisting of ground level plus six levels connected by lifts, stairs and internal ramps, with provision of approximately 900 commuter car parking spaces
- road work to provide pedestrian and vehicle access and egress from the proposed car park, and connection to Edmondson Park Station
- closed circuit television (CCTV), lighting and wayfinding signage for improved safety and security
- provision of a roof-top solar photovoltaic system, electric vehicle charging spaces, and motorcycle parking
- ancillary works including services diversion and/or relocation, drainage works and landscaping.

Once the new Edmondson Park Station (North) Commuter Car Park with approximately 900 spaces (the Proposal) is open to the public, the existing at-grade car park with approximately 200 spaces, north of the station, will be decommissioned and closed to the public.

The Proposal will provide a net increase of approximately 700 commuter car spaces in the Edmondson Park precinct.

The existing at-grade car park is zoned for mixed use development. The NSW Government is considering the future use of the site to deliver improved place and town centre outcomes contributing to the Edmondson Park Masterplan vision for a transit-oriented community.

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

Subject to design and approval, construction is expected to commence in mid 2022 and is expected to be complete in late 2023. A detailed description of the Proposal is provided in Chapter 3 of this REF. An overview of the Proposal is shown in Figure 1 below.

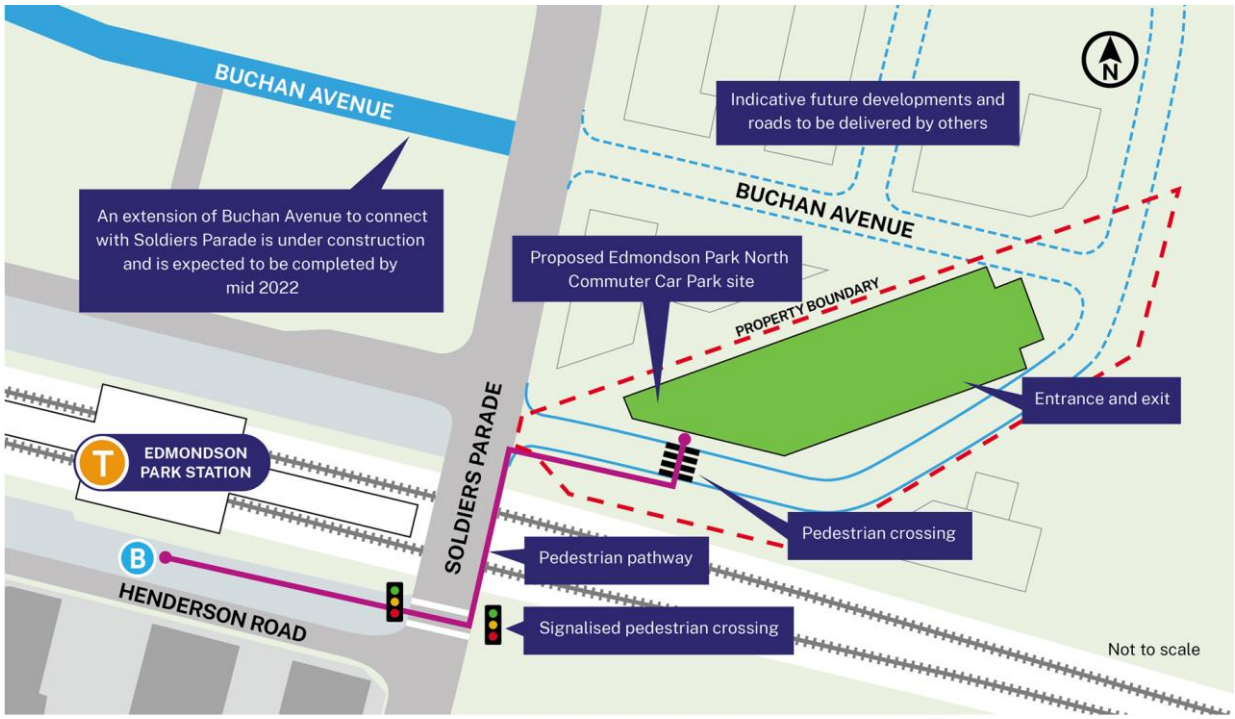

Figure 1 Proposed Edmondson Park Station (North) Commuter Car Park (indicative only, subject to detailed design)

Need for the Proposal

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

The 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.

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

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

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

The Proposal fulfils the program objectives by proposing to provide:

- improved customer access to the public transport network
- mode shift away from private vehicles
- reduced congestion on our road network.

Community and stakeholder consultation

Under the Transport and Infrastructure SEPP, consultation is required with local councils or public authorities in certain circumstances, including where Council-managed infrastructure is affected.

Community consultation activities for the Proposal were undertaken for a two-week period during 25 February 2022 and 13 March 2022 to help inform this REF. The public were invited to provide feedback to help Transport for NSW understand what is important to customers and the community. Further information about these specific activities is included in Section 5 of this REF.

During this period a Project Infoline (1800 684 490), email address (projects@transport.nsw.gov.au) and an online feedback form on the Transport for NSW website was available for members of the public to make enquiries and submit comments.

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

Feedback can be sent to:

I. projects@transport.nsw.gov.au

II. Commuter Car Park Program – Edmondson Park North

Transport for NSW

Locked Bag 6501

St Leonards NSW 2065

Or submitted:

III. www.transport.nsw.gov.au/edmondsonpark

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

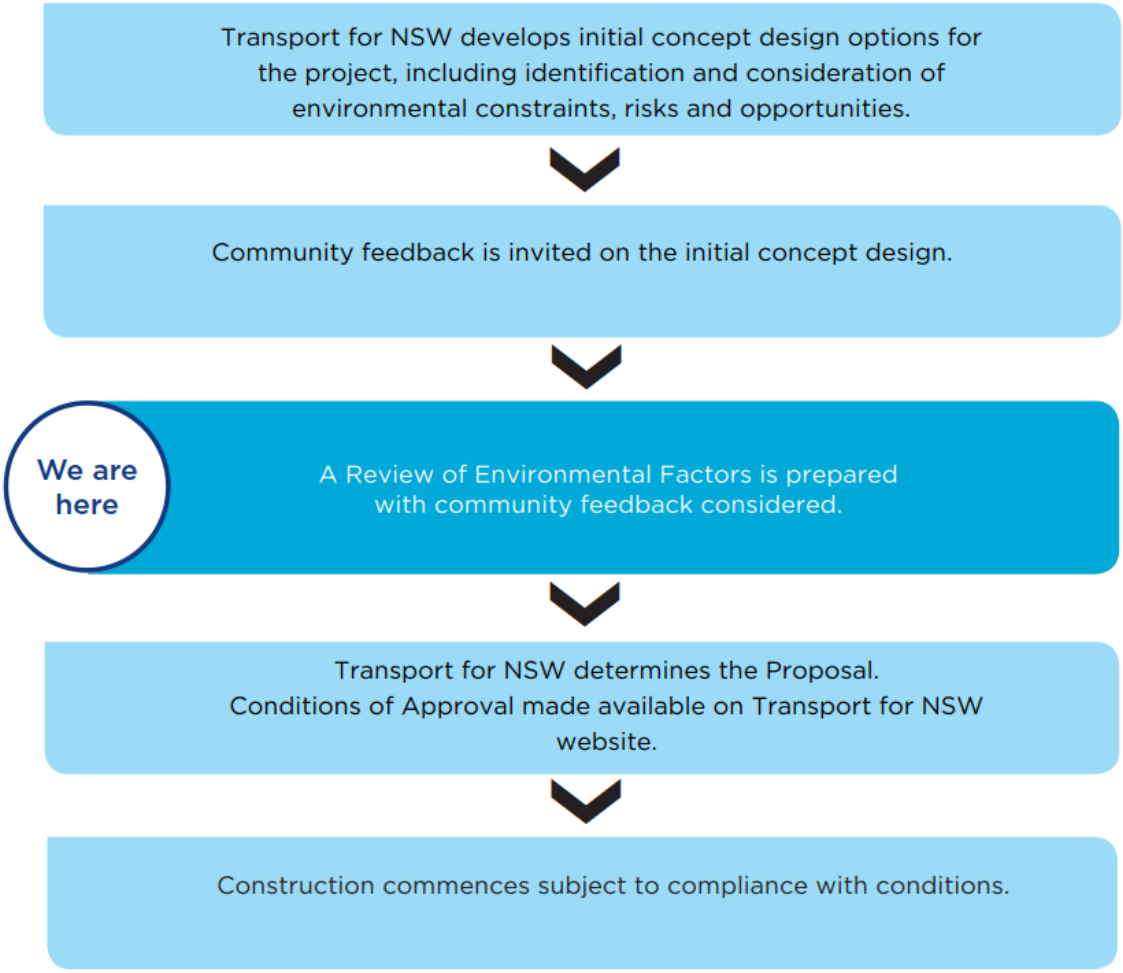

Figure 2 Planning approval and consultation process for the Proposal

Environmental impact assessment

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

The Proposal would provide the following benefits:

- additional commuter parking in close proximity to Edmondson Park Station facilitating improved opportunities to change modes of transport
- increasing accessibility and convenience to and from Edmondson Park Station potentially increasing the use of public transport
- improved customer experience by providing modern car parking facilities with weather protection, electric vehicle charging facilities, and security features including lighting and closed circuit television cameras
- reduction of the need for commuters to park in local 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 construction of the proposed car park
- additional inbound and outbound trips during operation, however key intersections are forecast to operate at the same satisfactory levels of service with some reserve capacity to accommodate future growth
- moderate noise impacts for some residential receivers during construction and operation
- temporary and permanent changes to access arrangements (including pedestrian diversions) and minor delays on the adjacent road network during construction
- temporary visual impacts during the construction and permanent visual impacts of a new structure
- removal of approximately 14 trees of transient planted native vegetation species.

Further information regarding these impacts and mitigation measures are provided in Chapter 6 and Chapter 7 of this REF.

Conclusion

This REF has been prepared having regard to Sections 5.5 to 5.7 of the EP&A Act, and section 171 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 *TfNSW Sustainable Guidelines - Version 4.0* (Transport for NSW, 2019) taking into account the principles of ecologically sustainable development (ESD).

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

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

1 Introduction

Transport for NSW is the lead agency for integrated delivery of public transport services across all modes of transport in NSW. Transport for NSW is the proponent for the Edmondson Park Station (North) Commuter Car Park (the Proposal).

1.1 Overview

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 a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

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.

1.1.1 Objectives of the Commuter Car Park Program

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 1.

Table 1 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

Category	Objectives
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.

1.2 The Proposal

The Proposal, which forms part of the Commuter Car Park Program, involves the construction and operation of a multi-storey car park with integration into the existing road and pedestrian network at a site in close proximity to Edmondson Park Station. The multi-storey car park would be constructed on a vacant site, off Soldiers Parade, to the north-east of Edmondson Park Station.

The Proposal is summarised as follows:

- construction and operation of a multi-storey car park, consisting of ground level plus six levels connected by lifts, stairs and internal ramps, with provision of approximately 900 commuter car parking spaces
- road work to provide pedestrian and vehicle access and egress from the proposed car park, and connection to Edmondson Park Station
- closed circuit television (CCTV), lighting and wayfinding signage for improved safety and security
- provision of roof-top solar photovoltaic system, electric vehicle charging spaces, and motorcycle parking
- ancillary works including services diversion and/or relocation, drainage works and landscaping.

Subject to planning approval, construction is expected to commence in mid 2022, and is expected to be complete in late 2023.

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

1.3 Location and existing infrastructure

The Proposal is located in the suburb of Edmondson Park, NSW, approximately 40 kilometres southwest of the Sydney Central Business District (CBD) within the Liverpool Local Government Area (LGA). Edmondson Park Station is located on the T2 Inner West and Leppington Line, which provides services to south-west Sydney, the Sydney CBD; and the T5 Cumberland Line, which provides services between Richmond and Campbelltown. The regional location of the Proposal is shown in Figure 3.

Figure 3 Regional context

1.3.1 Existing site

The Proposal is located on a vacant site, off Soldiers Parade, to the north-east of Edmondson Park Station as shown in Figure 4. The Proposal site is legally described as Lot 305 DP 1259974 and Lot 306 DP 1259974.

Construction of Edmondson Park Station and surrounding at-grade commuter car parks was completed in 2015.

The Edmondson Park Station (South) multi-storey commuter car park, providing over 1250 additional spaces for transport customers, located to the south-west of Edmondson Park Station was completed in February 2022.

A large proportion of the area surrounding the station and the Proposal site is yet to be developed. The broader area, outside of the Edmondson Park town centre, consists of medium to low density residential developments. The nearest residential areas to the Proposal site are apartments located approximately 140 metres to the south-west in the new Edmondson Park town centre, and approximately 350 metres to the north-west on Soldiers Parade. Land to the south on the opposite side of the South West Rail Link (SWRL) corridor is currently vacant, but terrace dwellings are planned approximately 100 metres from the Proposal site.

The Proposal site is an area of undeveloped land within a mixed use zone. The site was completely cleared of vegetation in 2012 during the development of the SWRL and Edmondson Park Station (Figure 5) and is now vegetated with grasses and small trees along the northern boundary (Figure 6 and Figure 7).

The site surrounds include:

- Undeveloped sites to the north, which are identified for mixed use and expansion of the local road network in the Edmondson Park South Concept Plan.
- Soldiers Parade to the west.
- The SWRL corridor to the south. The southern portion of the subject site contains an existing road, which provides access from Soldiers Parade to the Proposal site and a SWRL substation. This road will eventually form part of the local road network and connect the site to properties to the north.
- The eastern portion of the site also contains the existing road that wraps around from the south and currently terminates on the eastern side of the Proposal site. Further to the east is bushland set aside in the Edmondson Park Concept Plan as a regional park and zoned National Parks and Nature Reserves (E1).

Figure 4 Proposal site locality map (base map source: NearMap, 11 August 2020)

Figure 5 Aerial Image of approximate Proposal site completely cleared during construction of SWRL and Edmondson Park Station (base map source: NearMap, 1 November 2012)

Figure 6 The Proposal site viewed from the existing access road near the western corner of the site and the intersection with Soldiers Parade (Source: Transport for NSW).

Figure 7 Looking across the Proposal site from the current terminus of the existing access road towards the south-west and the Edmondson Park town centre in the background (Source: Transport for NSW).

1.3.2 Planned growth area

Edmondson Park was rezoned to support urban development in 2008 and was originally part of the NSW Governments' South West Priority Growth Area. The Edmondson Park area was deemed a State Significant Precinct in 2011 under the *State Environmental Planning Policy (State Significant Precincts) 2005*. A State Significant Precinct is an area with state or regional planning significance for:

- achieving government objectives, particularly delivery of housing and jobs
- conservation of environmental or natural resources
- heritage or historical significance.

Over the next 10 to 15 years, it is anticipated that approximately 8,200 dwellings would be developed in Edmondson Park and the area would increase to a population of around 25,000 new residents (Liverpool City Council, 2019).

On 18 August 2011, the Edmondson Park South Concept Plan (MP10_0118) was approved by the Planning and Assessment Commission (now known as the Independent Planning Commission). The Concept Plan applies to approximately 413 hectares, including the Proposal site and the area surrounding the Station. The Concept Plan has been modified five times, and at the time of writing three further modifications were at various stages of assessment. The spatial layout of the Concept Plan as shown in Figure 8 below establishes the overall planning framework for the Edmondson Park South area (Frasers Property, 2018). The Proposal site is identified as part of the 'Mixed-Use Town Centre'.

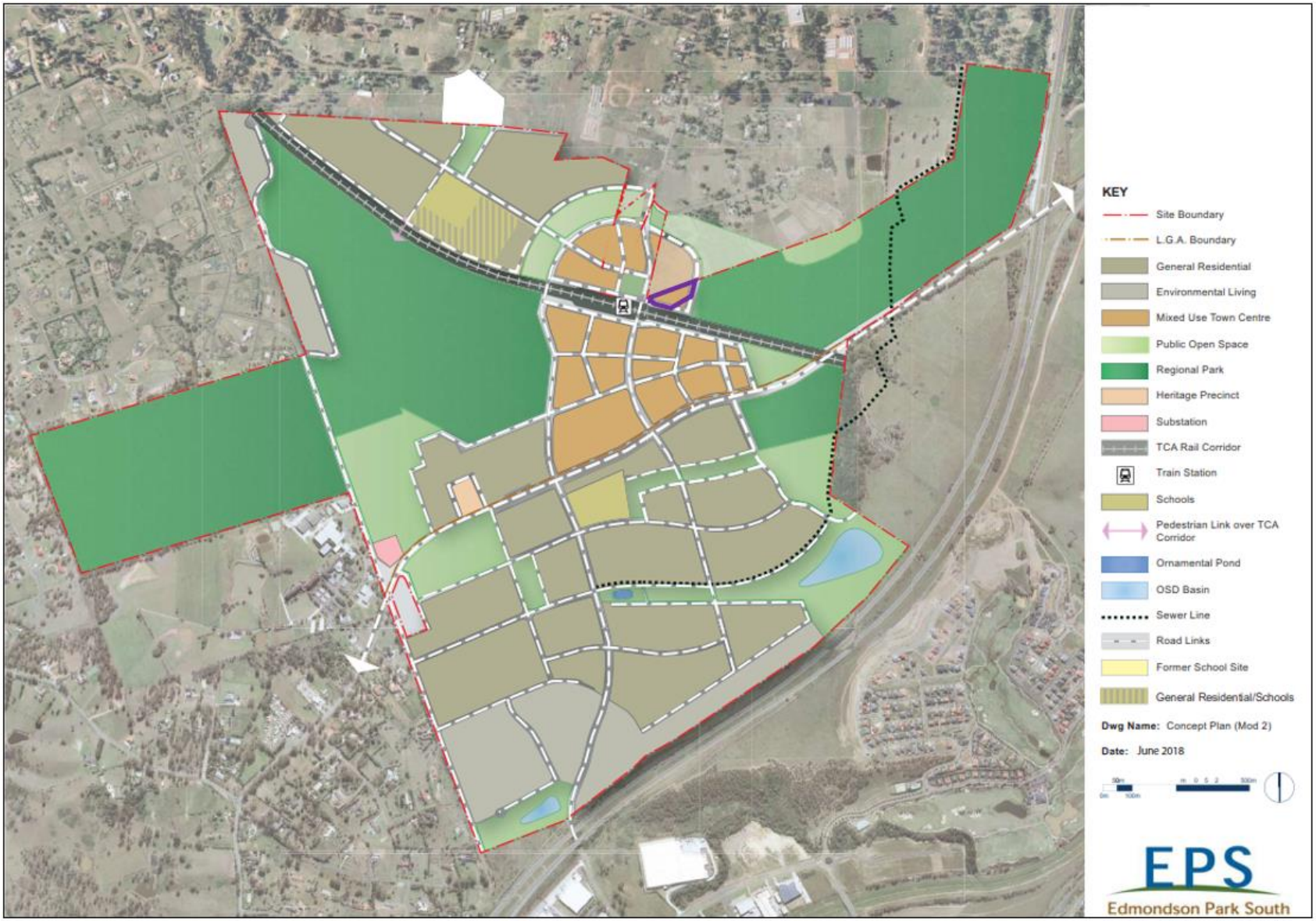

Figure 8 Edmondson Park South Concept Plan (Location of Proposal site shown in purple) (Source: Frasers Property, 2018)

1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by SNC-Lavalin Atkins on behalf of Transport for NSW to assess the potential impacts of the Edmondson Park Station (North) Commuter Car Park. For the purposes of this work, Transport for NSW is the Proponent and the determining authority under Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of this REF is to describe the Proposal, to assess the likely impacts of the Proposal having regard to the provisions of section 5.5 of the EP&A Act, and to identify mitigation measures to reduce the likely impacts of the Proposal. This REF has been prepared in accordance with section 171 of the *Environment Planning and Assessment Regulation 2021* (the EP&A Regulation).

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

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

2 Need and options considered

Chapter 2 discusses the need and objectives of the Proposal, having regard to the objectives of the Commuter Car Park Program (refer to Section 1.1.1). This chapter also provides a summary of the options that have been considered during development of the Proposal and why the preferred option has been chosen.

2.1 Strategic justification

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

The proposed Edmondson Park Station (North) 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.

The NSW Government has developed *Future Transport Strategy 2056* (Transport for NSW, 2020). This plan provides a comprehensive strategy for all modes of transport across NSW over the next 40 years, while also delivering on current commitments.

The Proposal site is located in an area undergoing significant growth and development. It is anticipated that there will be significant growth in population and employment in the area within the station catchment. The Proposal therefore assists in providing improvements at Edmondson Park Station to accommodate the forecast patronage growth and changing travel patterns.

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

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

Policy / Strategy	Overview	How the Proposal aligns
Future Transport Strategy 2056 (Transport for NSW, 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 customer focus and accessible services outcomes. The Proposal would support accessible services (outcome 5) by improving accessibility to public transport and creating travel options for more customers. Additionally, by encouraging public transport use the Proposal would support the sustainability objective (outcome 6) by improving affordability for customers and helping to reduce the number of cars on the roads, resulting in (net) less emissions. The Proposal, with the installation of on-site renewable energy generation and electric vehicle charging stations would support the Future Energy Strategy, which forms part of this overall Future Transport Strategy. These installations align with Transport for NSW's commitment to securing our transport energy needs from sustainable sources and supports the transition of the transport sector to net zero emissions by 2050.
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 improved connectivity to Edmondson Park Station and to the planned town centre.
Western City District Plan (Greater Sydney Commission, 2018)	The Western City District Plan applies to the Blue Mountains, Camden, Campbelltown, Fairfield, Hawkesbury, Liverpool, Penrith and Wollondilly 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 Plan including the Western Parkland City.	In the Plan, Edmondson Park is identified as a growth area which needs infrastructure to support future development. Of the 22 planning priorities, the Proposal particularly supports the following: • Planning Priority W1: Planning for a city supported by infrastructure • Planning Priority W7: Establishing the land use and transport structure to deliver a liveable, productive and sustainable Western Parkland City.

Policy / Strategy	Overview	How the Proposal aligns
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*, the Greater Sydney Region Plan and the Regional Development Framework, brings together infrastructure investment and land-use planning for our cities and regions.	The Proposal supports investment in rail infrastructure and aligns with the need to continue to provide urban public transport to support Sydney's increasing population. The Proposal is also consistent with overall aims and objectives of the *Future Transport Strategy 2056* to improve transport infrastructure across NSW.
Premier's Priorities and State Priorities (NSW Government 2019)	The NSW Government has identified 14 Premier's Priorities and 18 State Priorities that are focused on growing the NSW economy, delivering infrastructure, protecting the vulnerable and improving health, education and public services across the State.	The Proposal would assist in meeting the key priority to develop well connected communities with quality local environments by investing in transport infrastructure and improving accessibility to public transport and encouraging greater use of public transport.
NSW Government's Electric Vehicle Strategy (NSW Government 2021)	The NSW Government is committed to increasing the uptake of EV's, allowing people to benefit from cheaper running costs and a cleaner, quieter and more sustainable transport network.	The proposal introducing EV charging stations would assist in addressing the key principles and actions around maximising economic and public health opportunities, achieving net zero emissions by 2050, building a world class EV charging network, and making it easy to drive an EV.

2.2 Future Transport Context – Sydney's South West

Commuter parking requirements at Edmondson Park Station may look 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 Edmondson Park and the surrounding South West region.

Future Transport Strategy 2056 (Transport for NSW, 2020) 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 *Future Transport Strategy 2056* (Transport for NSW, 2020) 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 (the Western Parkland City, the Central River City and the 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.

The Western Parkland City at Badgerys Creek will be one of Australia's most connected cities. Innovative public transport, aviation and digital infrastructure will bring residents closer to jobs, centres, education and the world. Some 200,000 new jobs will be created across a wide range of industries over the next 20 years.

The Western Sydney Airport and Aerotropolis will attract infrastructure, investment and knowledge-intensive jobs, and the benefits will flow into health and education, retail, hospitality, and industrial activities that will power the Western Parkland City. To support this, the NSW Government will invest in new transport links, better use of existing capacity, prioritise road space for more efficient vehicles and ensure the transport network balances the efficient movement of people and goods and sustains the liveability and sustainability of centres it passes through.

Work is underway to identify, protect and utilise corridors of land that can deliver transport infrastructure in the future. The Outer Sydney Orbital is a potential future motorway and freight rail line which would provide a major transport link between the North West and South West Growth Areas, connecting with the Western Sydney Airport and future employment hub. The South West Rail Link (SWRL) Extension and the North South Rail Line (including Sydney Metro Western Sydney Airport) have been identified as future passenger rail lines to provide a major transport link between the North West, Western Sydney Airport, South West and Greater Macarthur Growth Areas. The SWRL Extension is planned to extend from Leppington Station to North Bringelly for connections with the North South Rail Line corridor, which would then connect to the Main West Line near St Marys and the Main South Line near Macarthur.

The Australian and NSW Governments jointly commit to deliver the first stage of the North South Rail Link to the Western Sydney Airport including Sydney Metro – Western Sydney Airport, and the SWRL Extension from Leppington, as a high priority.

Future Transport Strategy 2056 (Transport for NSW, 2020) also recognises that rapid technology innovation is changing traditional modes of travel. The uptake of services such as ridesharing in recent years indicates that people are early adopters of technology-enabled services. The use of connected and automated vehicles is also predicted to increase considerably over time, with the likelihood of more mobility services delivered to reflect customers' personal preferences. These improvements will support the growth of Sydney by enabling more convenient access to jobs and services across the region.

As more integrated and technology-enabled transport improvements come to fruition, there is likely to be a reduced reliance on private vehicles, and transport demand being more evenly distributed across geographic areas. The extension of the SWRL would provide customers who currently drive long distances from neighbouring suburbs with more public transport choices closer to where they live. This is likely to reduce parking demand at Edmondson Park Station in the future.

Recent initiatives to improve bus services in the south west have included:

- additional services on bus route 869, which operates between Ingleburn and Liverpool via Edmondson Park
- additional services on bus route 841, which services Leppington
- additional services on bus route 896, which services Campbelltown
- new bus route 861 linking Leppington and Carnes Hill via Austral.

An on demand transport service (Interline Connect) is also operating in Edmondson Park which enables customers to conveniently book a bus to the station from a location near their home using an app.

Transport for NSW will continue to monitor demand in the area and consider opportunities for further transport initiatives, such as active transport links, bus and on-demand services to provide customers with more choice in how they travel to Edmondson Park Station.

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 1.1.1).

The specific objectives of the Edmondson Park Station (North) Commuter Car Park are to provide:

- additional commuter parking in close proximity to Edmondson Park Station to service increasing demand
- improved accessibility to transport linkages for employment and recreation
- improved customer experience (weather protection, better interchange facilities and visual appearance)
- improved integration with surrounding precinct
- improved customer safety.

2.4 Options considered

Investigations were undertaken to identify potential locations for additional commuter car parking near Edmondson Park Station. Transport for NSW completed preliminary scoping studies in November 2019 which considered the feasibility of several locations for additional commuter parking, as well as the needs of both transport customers and future residents of the Edmondson Park Town Centre. Table 3 outlines the shortlisted options that were considered, resulting in the adoption and construction of the Edmondson Park (South) multi-storey commuter car park and the subject Proposal being considered.

Table 3 Options considered for the Proposal

Option	Description	Considerations
Option 1	• Multi-storey car park to the north of the station • convert the existing at-grade car park north of Edmondson Park Station • access from Soldiers Parade.	• close proximity to the station entrance • land owned by Transport for NSW which enables the project to proceed without the need for property purchase and/or acquisition • construction would displace existing commuter car parking spaces • doesn't support town centre activation • central, town centre core location when compared to planned roads and has the potential to cause traffic congestion.

Option	Description	Considerations
Option 2	• multi-storey car park to the south of the station • convert the existing at-grade commuter car park south of Edmondson Park Station • access from Soldiers Parade, and Henderson Road.	• close proximity to the station entrance • land owned by Transport for NSW which enables the project to proceed without the need for property purchase and/or acquisition • opportunity to complement and integrate with future commercial development • construction would displace existing commuter car parking spaces.
Option 3	• multi-storey car park to the north of the station • vacant site east of Soldiers Parade • NSW Government land • access from Soldiers Parade.	• short walk to access the station • construction on the vacant site would minimise displacement of existing car parking spaces during construction • no existing pedestrian infrastructure to cross Soldiers parade from the site to the station entrance • irregular shaped parcel of land – not optimal for car park development • land agreement would need to be negotiated which would elongate delivery timeframe.
Option 4	• multi-storey car park to the north of the station • vacant (private) land east of Soldiers Parade • access from Soldiers Parade.	• construction on the vacant site would minimise displacement of existing car parking spaces during construction • no existing pedestrian infrastructure to cross Soldiers Parade from the site to the station entrance • land agreement would need to be negotiated which would elongate delivery timeframe • would require clearing of vegetation on non-biodiversity certified lands.
Option 5	• multi-storey car park to the north of the station • vacant (private) land west of Soldiers Parade, approx. 600 metres north of the station • access from Soldiers Parade.	• long distance from the station • construction on the vacant site would minimise displacement of existing car parking spaces during construction • pedestrian infrastructure partially available along Soldiers Parade • acquisition of private land required.

Option	Description	Considerations
Option 6	• multi-storey car park to the north of the rail corridor • vacant site approximately 500 metres west of the station.	• construction on the vacant site would minimise displacement of existing car parking spaces during construction • long distance from the station • forms part of a potential future school site and would require land swap or acquisition • no current road and pedestrian access (future planned road network still to be constructed)
Option 7	• a combination of private and NSW Government land (options 3 and 4 above) • multi-storey car park to the north of the station • vacant land • access from Soldiers Parade	• construction on the vacant site would minimise displacement of existing car parking spaces during construction • no existing pedestrian infrastructure to cross Soldiers parade from the site to the station entrance • would require the acquisition of private land which would elongate delivery timeframe.

2.4.1 The 'do-nothing' option

Under a 'do-nothing' option, the only multi-storey car park introduced for the Station would be Edmondson Park Station (South) Commuter Car Park. The 'do nothing' option would not provide sufficient car parking to 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 travelled by increased car trips for commuter journeys.

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

2.5 Justification for the preferred option

The need for providing additional commuter car parking in the vicinity of Edmondson Park Station is considerable. Every day hundreds of commuters park in non-dedicated spaces, creating congestion and hazards in and around the town centre.

Transport for NSW received strong community feedback during the consultation period in 2019 about the pressing need for additional parking at Edmondson Park Station and requesting the Proposal proceed as quickly as possible.

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.

All available options were considered with the needs of transport customers, the local community and future residents of Edmondson Park Town Centre in mind and the provision of a multi-storey car park on the existing commuter car park to the south of the station (Option 2) was the first preferred option, and the Proposal for a multi-storey car park to the north of the station on the vacant site east of Soldiers Parade (Option 3) was the second preferred option.

Option 1 was not preferred as, whilst being located close to the station, there is potential for increased traffic congestion within the town centre due to the central location of this site at the town centre core and its mid-block location when compared to the planned road network. This option would not support the future activation of the Edmondson Park town centre north of the station.

Options 6 and 7 were not preferred as they would require land agreements to be negotiated with landholders which would elongate the timeframe for delivery.

Option 4 was not preferred as it has the potential to increase traffic within the proposed town centre, may preclude planned town centre development such as community spaces, and would require clearing of native vegetation where offsetting arrangements are not already in place (on non-biodiversity certified lands).

Option 5 was not preferred as, whilst being relatively close to arterial roads, is situated a long distance from the station – the furthest of all options.

Option 2, was an existing at-grade commuter car park south of Edmondson Park Station. This option was chosen as the site for the Edmondson Park (South) multi-storey commuter car park. This car park was completed in early 2022. Option 2 was chosen because it increases connectivity for commuters without precluding future integration, is within easy walking distance of Edmondson Park Station on land already owned by Transport for NSW, it is accessible via peripheral roads, and because of its suitable dimensions, shape and ease of building in the context of the wider precinct.

The Proposal (Option 3) has subsequently been chosen as the best outcome, in association with the new Edmondson Park (South) multi-storey commuter car park, to deliver the forecast parking demand for commuters and future residents of the town centre.

The sites shape, configuration and proximity to the rail corridor, make the site less desirable and efficient for housing. However, limitations of the site were also identified for a proposed multi-storey car park in its irregular shape without frontage to Soldiers Parade, which does not provide efficient connectivity to Edmondson Park Station. In addition, the existing access road slopes down from Soldiers Parade, which would mean pedestrians would be required to walk uphill to the station, and installation of pedestrian crossing facilities would be required.

Despite the limitations, the Proposal is on vacant land a short walk, north-west of the station. The land is identified for ‘Mixed Use Town Centre’ within the Concept Plan and is Biocertified so that vegetation removal does not require assessment, referral or approval under the EPBC Act. Construction on the vacant site would not result in displacement of existing car parking spaces during construction.

The Proposal location is in close proximity to the station, providing access to the established and future shopping, dining and entertainment facilities of the Edmondson Park town centre.

Urban design principles would be used to ensure the Proposal is not only functional, but sustainable and aligned to place-based principles and outcomes to complement the character of the area including aesthetics, streetscapes and setbacks. Visual elements, such as quality facade treatments and landscaping, would be key factors considered as part of the detailed design process.

The Proposal would be in keeping with the existing road network and the planned modifications to the network would help direct traffic away from the town centre, improve traffic flow in and around the station precinct and car park.

3 Proposal description

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

3.1 Scope of works

The Proposal involves the construction of a multi-storey car park with integration into the existing road and pedestrian network as part of the Commuter Car Park Program. The Proposal would provide a multi-storey car park with provision of approximately 900 commuter car parking spaces, consisting of ground level plus six levels. The Proposal site is a vacant site, located off Soldiers Parade, to the north-east of Edmondson Park Station.

The Proposal would include the following key elements:

- Clearing, leveling and compaction of the site
- provision of a ground level plus six levels of commuter car park including:
  - approximately 900 commuter car parking spaces
  - lift and stair access
  - internal circulation ramps connecting the levels
  - provision for electric vehicle charging stations
  - Transport Park&Ride infrastructure (Opal card operated boom gates)
- road work to provide pedestrian and vehicle access and egress from the proposed car park, and connection to Edmondson Park Station, which may include:
  - the provision of an unsignalised pedestrian crossing on the Proposal access road
  - provision of new signalised pedestrian crossing at the Henderson Road and Soldiers Parade intersection
  - modifications to street parking, kerbs, footpaths and provision of ramps and pedestrian fencing as required
- closed circuit television (CCTV), lighting and wayfinding signage for improved safety and security
- installation of roof-top solar photovoltaic system, electric vehicle charging spaces, and motorcycle parking
- ancillary works including services diversion and/or relocation, drainage works, landscaping, installation of lighting, installation of handrails and balustrades.

The general layout of key elements for Edmondson Park Station North Commuter Car Park are shown in Figure 9 and Figure 10.

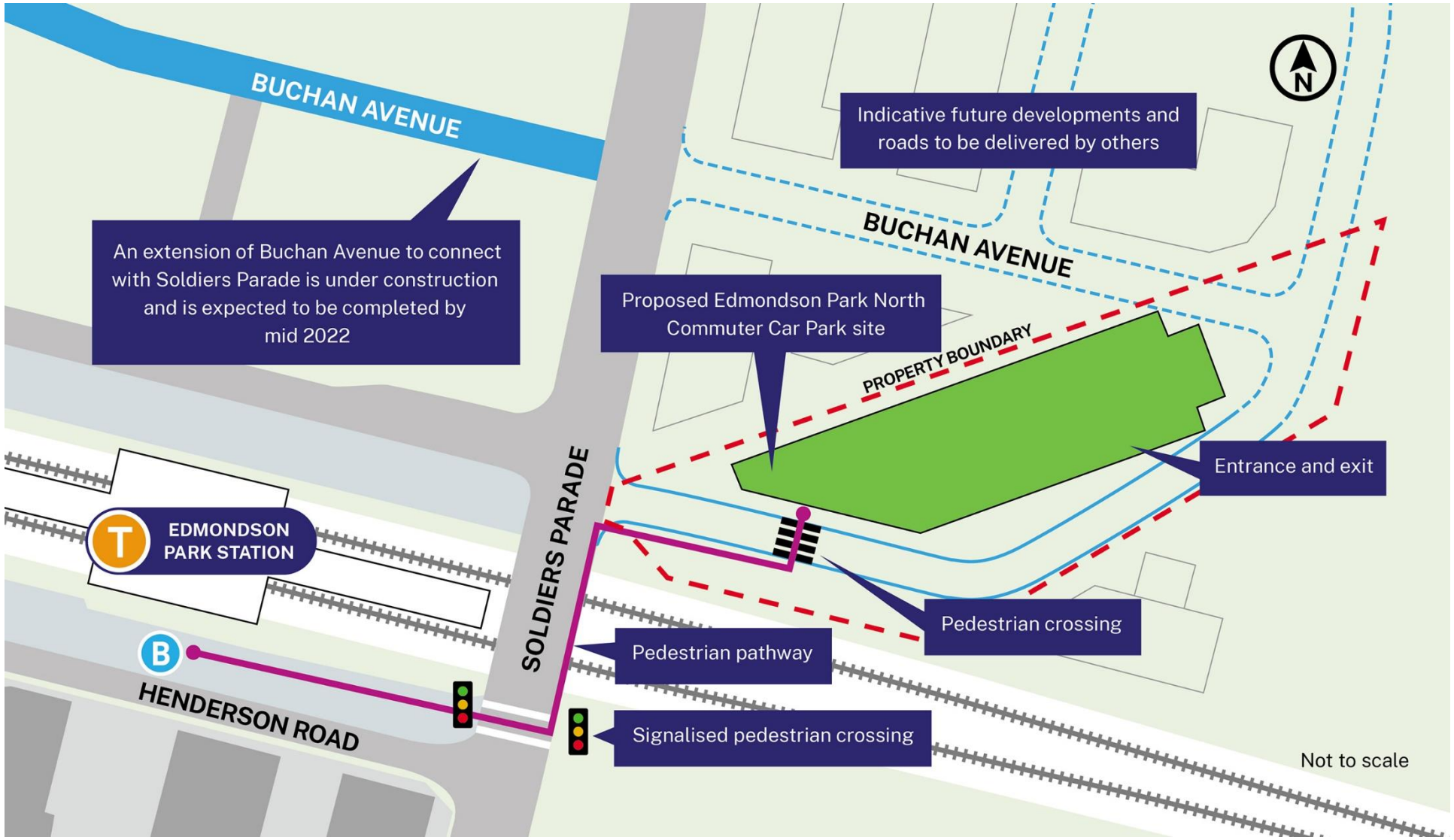

Figure 9 Car park footprint shown in green (indicative only and subject to detailed design).

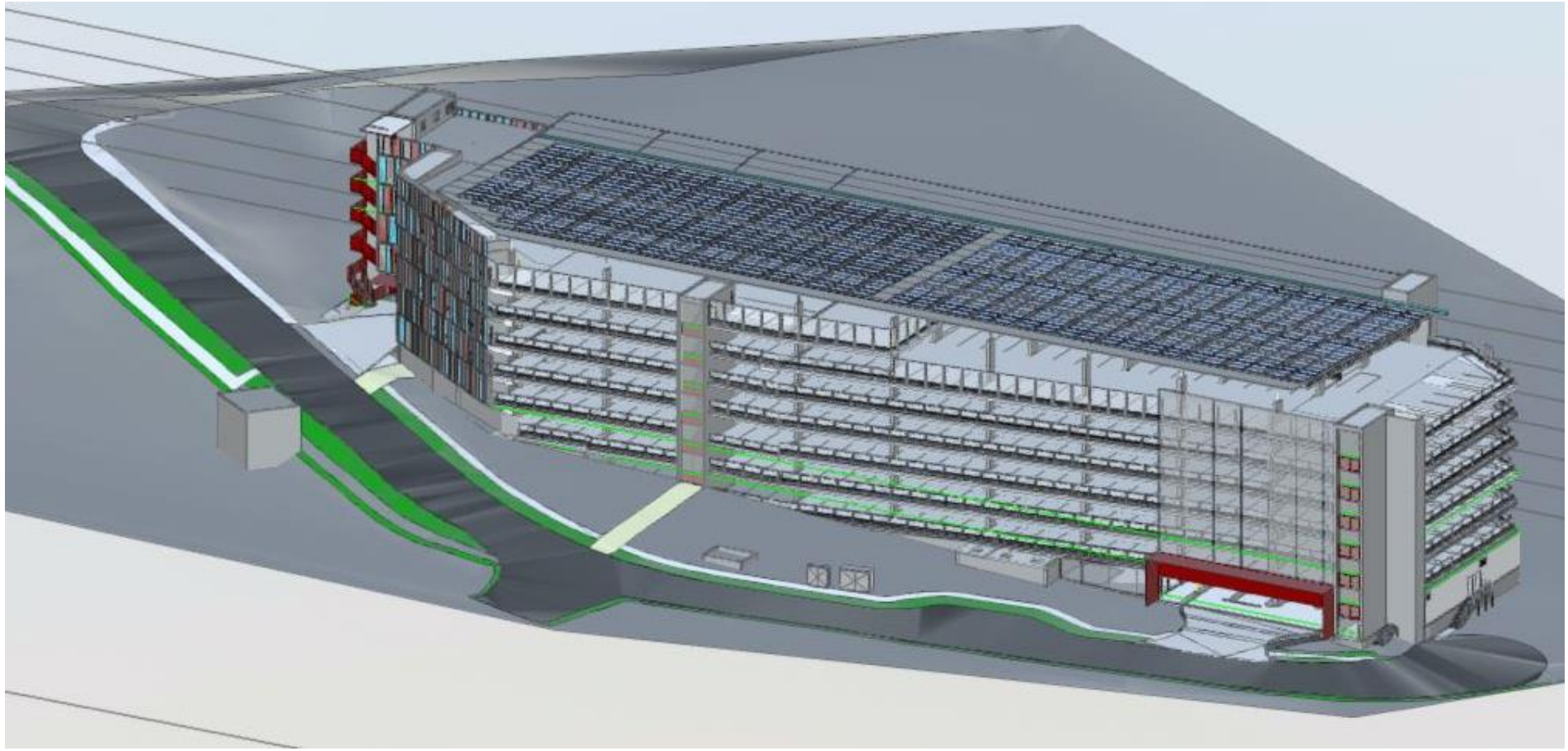

Figure 10 Three-dimensional overview of proposed commuter car park looking from the southeast (indicative only and subject to detailed design).

Once the new Edmondson Park (North) Commuter Car Park with approximately 900 spaces (the Proposal) is open to the public, the existing at grade carpark with approximately 200 spaces, north of the Station, will be decommissioned and closed to public.

The Proposal will provide a net increase of approximately 700 commuter car spaces in the Edmondson Park precinct.

The existing at grade carpark is zoned for mixed use development. The NSW Government is considering the future use of the site to deliver improved place and town centre outcomes contributing to the Edmondson Park Masterplan vision for a transit-oriented community.

3.1.1 Materials and finishes

The proposed multi-storey car park involves a ground floor concrete slab and the addition of seven suspended levels above.

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

- durability, low maintenance and cost effectiveness (including the use of anti-graffiti paint or coatings)
- colour options are most likely to use a palette of neutral tones to blend the car park with the natural elements of the neighbourhood, and to create a less obtrusive facade
- identify appropriate screening treatments which could be applied to maintain optimum ventilation to comply with the requirements of an open-deck car park
- materials are to be selected on the basis of sustainability principles, in particular lower embodied carbon, use of recycled materials and properties assist with the reduction of the urban heat island effect. Such materials may include use of recycled crushed glass content in concrete, asphalt, and steel. concrete with recycled material.availability and constructability criteria to ensure resources are readily available, and for the structure to be constructed with ease and proficiency.

Consideration would also been given to lifecycle 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.

3.2 Design development

3.2.1 Engineering and environmental constraints

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

Existing local road network: the placement of the entry/exit and current development of the local road network.

Utilities: A Dial Before You Dig (DBYD) search has identified a number of utilities in the vicinity of the proposed works as described in Section 3.3.8.

Other considerations:

- minimising impacts to commuter parking and access to Edmondson Park Station
- construction activities adjacent the Proposal site

- sustainability including social, economic and environmental sustainability considerations as per Proposal objectives and achievement of a *TfNSW Sustainable Guidelines Version 4.0* minimum design rating of 'Silver'.

3.2.2 Design standards

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

- *Disability Standards for Accessible Public Transport 2002* (issued under the Commonwealth *Disability Discrimination Act 1992*)
- National Construction Code
- relevant Australian Standards
- Asset Management Branch (AMB) Standards
- *TfNSW Commuter Car Parks urban design guidelines*
- *TfNSW Creativity Guidelines for transport systems*
- *TfNSW Sustainable Design Guidelines – Version 4.*0 (Transport for NSW 2019)
- *Guidelines for the Development of Public Transport Interchange Facilities* (Ministry of Transport, 2008).
- Crime Prevention Through Environmental Design (CPTED) principles
- other Transport for NSW policies and guidelines
- relevant council standards.

3.2.3 Sustainability in design

Transport for NSW is committed to minimising the impact on the natural environment and is committed to the principals of sustainability through the development and use of the *TfNSW Sustainable Design Guidelines version 4.0* (Transport for NSW, 2019) (Sustainable Design Guidelines).

The concept development has been undertaken in accordance with the Sustainable Design Guidelines, which seek to deliver sustainable development practices by embedding sustainability initiatives into the planning, design, construction, operations and maintenance of transport infrastructure projects. The development of the guidelines has been influenced by the *TfNSW Environment and Sustainability Policy*. The guidelines incorporate the following key aims:

- Minimising impacts on the environment, whether through transport operations, infrastructure delivery or maintenance
- Procuring, delivering and promoting sustainable transport options that achieve value for money and reduced life cycle costs
- Developing, expanding and managing the transport network that is sustainable and climate resilient.

3.3 Construction activities

3.3.1 Work methodology

Subject to approval, construction is expected to commence in mid 2022 and is expected to be complete in late 2023. The construction methodology would be further developed during the

detailed design of the Proposal by the nominated Construction Contractor in consultation with Transport for NSW.

The proposed construction activities for the Proposal are identified in Table 4. This staging is indicative and is based on the current concept design and may change once the detailed design methodology is finalised.

Table 4 Indicative construction staging for key activities

Stage	Activities
Site establishment and enabling works	• establishment of footpath / pedestrian management and traffic controls • establishment of site compound (erect fencing, site offices, amenities and plant/material storage areas etc.) • establishment of environmental control measures such as erosion and sediment controls • identification of vegetation approved for removal
Relocation of services and preparation of substructure	• clear identification of services for protection or relocation • relocation or protection of services.
Construct floor slabs, columns and walls	• excavation at ground levels, with minor cut and fill earthworks • preparation of support structures for the columns and stairs • preparation of substructure (preparation of service drainage and foundations) • construction of floor slabs, columns and walls • installation of building services including electrical, CCTV and mechanical ventilation • construction of footpaths, ramps, kerbs, islands, fences and surface treatments where required • installation of lighting, signage, internal car park road surface and line marking.
Construction of external cladding/facade	• construction of external cladding/façade (subject to detailed design).
Construction of road works to connect car park to road network	• excavation of existing road pavement • laying of concrete and asphalt over the external sections of road • installation of new signage where required • completion of kerbing and concrete works • finishing of pavement including any surfacing and re-surfacing works • construction of signalised crossing at the intersection of Henderson Road and Soldiers Parade • completion of landscaping (subject to detailed design).
Testing and commissioning	• completion of various activities to test and commission power supply, lifts and lighting.

Decommissioning of temporary facilities and site demobilisation	• removal of temporary site facilities • removal of temporary footpath / pedestrian management and traffic controls • removal of environmental control measures • completion of site clean-up and tidying works.

3.3.2 Plant and equipment

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

- trucks
- generator
- bobcat
- hand tools
- mulcher
- chainsaw
- excavator (with auger)
- cranes
- tower cranes
- helicopter trowel (smoothing out concrete)
- rattle gun
- lighting towers
- vibratory roller
- demolition saw
- jack hammer
- grinder
- continuous flight auger rig
- concrete truck and agitator / or piling rig
- concrete pump
- small mobile crane
- hand held soil compactor or whacker rammer
- nail gun
- scissor lift
- paving machine
- coring machine
- grinder
- stump grinder
- elevated working platform

3.3.3 Working hours

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

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

Work outside of standard hours including at night and on weekends may be required occasionally.

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

3.3.4 Earthworks

Excavations and earthworks would generally be required for the following:

- removal of vegetation and levelling of the existing site
- piling and excavation for car park foundations and support structures

- tie-in work in relation to existing roads and pathways
- other minor civil work, including drainage/stormwater works, and trenching activities for underground service adjustments and relocations.

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

3.3.5 Source and quantity of materials

The source and quantity of materials would be determined during the detailed design phase of the Proposal and would consider the requirements of the *NSW Sustainable Design Guidelines – Version 4.0* (Transport for NSW, 2019).

Materials would be sourced from local suppliers where practical. Reuse of existing and recycled materials would be undertaken where feasible. Consideration would also be given to life cycle impacts of each material chosen which would be calculated by assessing the environmental impacts of materials from the point of extraction, through to transportation, use, operation and end of life.

3.3.6 Traffic access and vehicle movements

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

- temporary changes in pedestrian, cyclist and vehicle access and movements
- potential temporary disruptions to access on the substation access road.

A detailed construction methodology and associated management plans (i.e. Construction Environmental Management Plan (CEMP) and an Environment Control Map (ECM)) would be developed by the Contruction Contractor during the detailed design phase of the Proposal to manage potential traffic and access impacts.

3.3.7 Temporary site facilities

Temporary construction compounds would be required to accommodate a site office, amenities, laydown and storage area for materials. The proposed ancillary facilities would be located in various parts of the Proposal site and adjoining land as shown in Figure 11.

The site offices and amenities would be located along the eastern boundary of the site and within the terminus of the current road reserve. Material laydown and storage area would be located in the western tip of the construction area and on the opposite side of the access road adjacent the SWRL corridor. A temporary sediment basin to capture overland stormwater runoff would be established in the north-east corner of the site to prevent sediment runoff into the adjoining regional parklands.

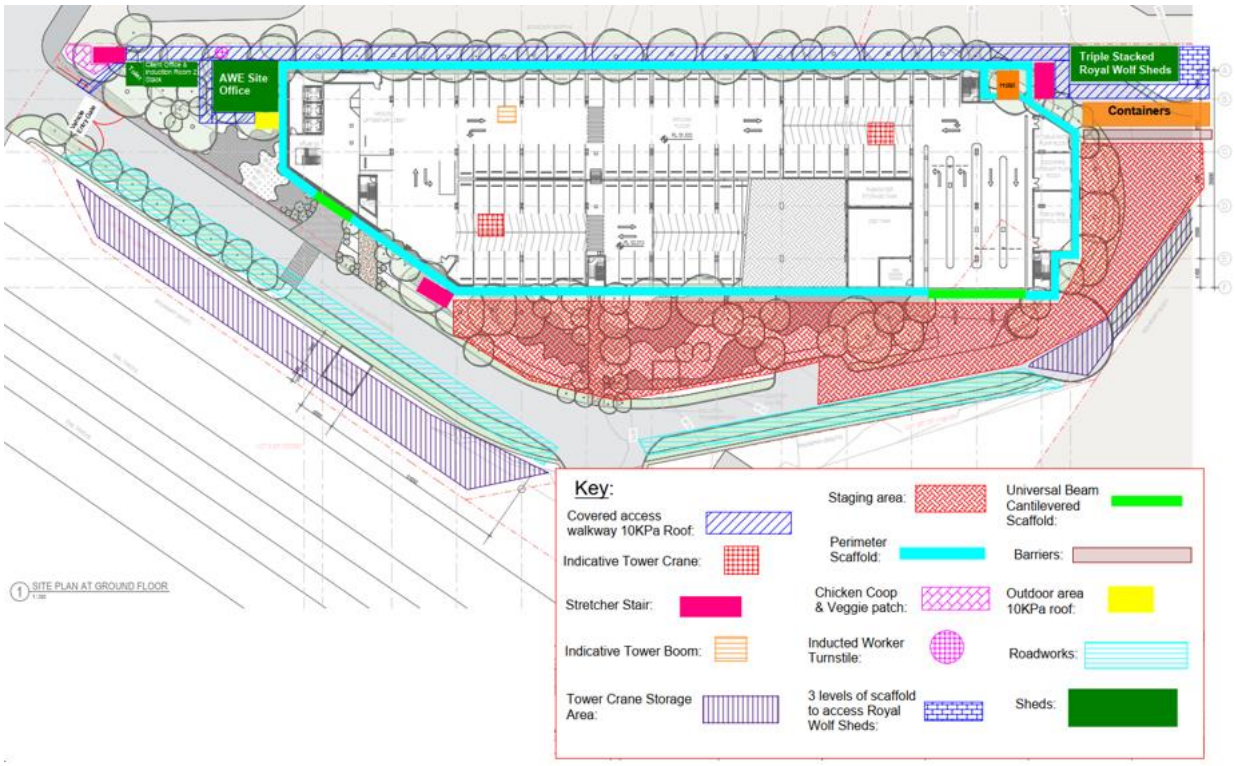

Figure 11 Indicative site establishment plan outlining temporary site access, accommodation and storage facilities (subject to contractor requirements)

3.3.8 Service relocation and adjustments

A DBYD search was completed for the Proposal site. The following utilities were within the vicinity of the Proposal site:

- electricity (High Voltage Cable, Sydney Trains)
- electricity (Endeavour Energy)
- gas (Jemena)
- kerb and gutter and stormwater pipes (Liverpool City Council)
- communications (NBN Co, Telstra)
- potable water (Sydney Water)

The Proposal would be designed to avoid the relocation of service and utilities where practical, however service location modifications and relocations may be required for the Proposal. Where utilities require relocation or modification, the service provider would be consulted.

3.4 Property acquisition and road dedication

Transport for NSW has an agreement to acquire the property from Landcom. The proposed car park site would be wholly located on land owned by Transport for NSW.

The road providing access from Soldiers Parade to the site and the SWRL substation, which is currently part of the Proposal site (Lot 306 DP1259974) will become public road after the Proposal has been constructed. This may be by gazettal or TfNSW may approve a Plan of Subdivision that dedicates the land as public road. Liverpool City Council will be the Roads Authority responsible for this local road.

The eastern end of Lot 305 DP1259974, which is currently part of the Proposal site, will provide an area for stormwater detention/treatment from the Proposal development.
This area may form part of the future public road network in the Edmondson Park Masterplan and if feasible, connect to a new road and drainage infrastructure to the north, subject to agreement by TfNSW.

3.5 Operation and maintenance

The operation and maintenance of the proposed commuter car park is subject to further discussions with Sydney Trains, Transport for NSW and Liverpool City Council. The car park structure constructed under this Proposal would be maintained by Sydney Trains.

4 Statutory considerations

Chapter 4 provides a summary of the statutory considerations relating to the Proposal including 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 *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places - defined in the EPBC Act as 'matters of National Environmental Significance (NES)'. The EPBC Act requires the assessment of whether the Proposal is likely to significantly impact on matters of NES or Commonwealth land.

To facilitate development of the growth areas to support Sydney's growing population, a strategic assessment of the impacts of developing the identified precincts including the South West Growth area was undertaken under the EPBC Act in 2010. During the strategic assessment, large areas of land were identified for development, offsetting and biodiversity certification (in accordance with the biodiversity certification process under NSW legislation, refer Section 4.2.3 below). The Sydney Growth Centres Strategic Assessment Program Report (Department of Environment, Climate Change and Water & NSW Department of Planning, 2010) was referred to the federal Department of Sustainability, Environment, Water, Population and Communities as a strategic program under the EPBC Act. On 20th December 2012, the Federal Minister for the Department endorsed the program and report.

The endorsement of the program constitutes an approval under section 146B of EPBC Act. Actions approved in accordance with the strategic assessment do not require separate referral, assessment or approval under the EPBC Act. As the Proposal is located within Biodiversity Certified land identified in the strategic assessment, the vegetation removal within those areas does not require referral, assessment or approval under the EPBC Act.

NES matters are considered in full in Appendix A. The Proposal is unlikely to have an impact on any matters of NES or Commonwealth land and a referral to the Commonwealth Minister for the Environment is not required.

4.1.2 Other Commonwealth legislation

Table 5 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 does not include any previously identified Aboriginal sites and/or places (refer Section 6.4); however, considerations for unexpected finds are further detailed in mitigation measures and applies to this Act.
Disability Discrimination Act 1992	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. Development of the Edmondson Park station precinct has been designed having regard to the requirements of this Act. To provide better access to the Station for commuters with accessibility needs, all required accessible parking for the precinct has been provided in the Edmondson Park (South) commuter car park. The proposed car park would have lift access and a ramp directly accessing the pedestrian footpath at the western end of Level 2, the shortest distance to the station.

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*:

a) to plan for a transport system that meets the needs and expectations of the public

b) to promote economic development and investment

c) to provide integration at the decision-making level across all public transport modes

d) to promote greater efficiency in the delivery of transport infrastructure projects

e) to promote the safe and reliable delivery of public transport and freight services.

4.2.2 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) establishes the system of environmental planning and assessment in NSW. This Proposal is subject to the environmental impact assessment and planning approval requirements of Division 5.1 of the EP&A Act. Division 5.1 specifies the environmental impact assessment requirements for activities undertaken by public authorities, such as Transport for NSW, which do not require development consent under Part 4 of the Act.

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

Section 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Regulation) defines the factors which must be considered when determining if an activity assessed under Division 5.1 of the EP&A Act has a significant impact on the environment. Chapter 6 of the REF provides an environmental impact assessment of the Proposal in accordance with section 171 and Appendix B specifically responds to the factors for consideration under section 171.

4.2.3 Other NSW legislation and regulations

Table 6 provides a list of other relevant legislation applicable to the Proposal.

Table 6 Other NSW legislation applicable to the Proposal

Applicable legislation	Considerations
Aboriginal Land Rights Act 1983	Section 36 of the Act permits claims to be made by the NSW Aboriginal Land Councils for certain Crown lands to be transferred to it. Local Aboriginal Land Councils can also make claims for land within their area. The Crown Lands Minister may either grant a claim by transferring the land to the relevant Aboriginal Land Council or refuse to grant a claim. The Local Aboriginal Land Council for the Proposal site is the Tharawal Local Aboriginal Land Council.
Biodiversity Conservation Act 2016 (BC Act)	The BC Act establishes a framework for assessing and protecting environmental and public interests. The Proposal site is on land that was biodiversity certified under the Part 7 of Schedule 7 of *Threatened Species Conservation Act 1995* (TSC Act). Biodiversity Conservation (Savings and Transitional) Regulation 2017 provided that Part 7 of Schedule 7 of the TSC Act would continue to operate despite the TSC Act being repealed in 2017. Clause 8.4 of the BC Act states that any activities under Part 5 (now Division 5.1) of the EP&A Act carried out on biodiversity certified land are not likely to significantly affect threatened species or ecological communities and the Determining Authority does not need to consider biodiversity impacts on that land (refer to Section 6.7).
Biosecurity Act 2015	Clause 22 requires any person who deals with a biosecurity matter has a duty to ensure that in so far as is reasonably practicable, the potential biosecurity risk is prevented, eliminated or minimised. Appropriate management methods would be implemented during construction if declared noxious weeds in the Liverpool LGA are identified (refer to Section 6.7).

Applicable legislation	Considerations
Contaminated Land Management Act 1997 (CLM Act)	Section 60 of the CLM Act imposes a duty on landowners to notify the Environment Protection Authority (EPA), and potentially investigate and remediate land if contamination is above EPA guideline levels. The Proposal site has not been notified under the CLM Act as being contaminated (refer to Section 6.8).
Heritage Act 1977 (Heritage Act)	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. The Proposal is not located in close proximity to any heritage items listed on the local, State or National heritage registers and would be unlikely to impact a heritage item (refer to Section 6.5).
Land Acquisition (Just Terms Compensation) Act 1991	Property acquisition would need to be managed in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991.*
National Parks and Wildlife Act 1974 (NPW Act)	Sections 86, 87 and 90 of the NPW Act require consent from the Department of Planning, Industry and Environment for the destruction or damage of Aboriginal objects. Sections 151–153D of the Act specify the uses for which leases, licences or easements can be granted. Section 153 relates to approval for easements which can be granted by the Minister for or for the construction of pipelines, or for the erection of standards, posts, wires and appliances for the conveyance or transmission of electricity, or for any other purpose deemed necessary. The Proposal is unlikely to disturb any Aboriginal objects (refer Section 6.4). However, if unexpected archaeological items or items of Aboriginal heritage significance are discovered during construction of the Proposal, all works would cease, and appropriate advice sought.
Protection of the Environment Operations Act 1997 (PoEO Act)	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 Construction Contractor.

Applicable legislation	Considerations
Roads Act 1993 (Roads Act)	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads. The Proposal would require road work within currently unnamed roads, where Liverpool City Council is the roads authority and would be consulted during detailed design (refer to Section 6.1).
Sydney Water Act 1994	The Proposal would not involve discharge of wastewater to the sewer.
Waste Avoidance and Resource Recovery Act 2001 (WARR Act)	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 prior to construction commencing.
Water Management Act 2000 (WM Act)	Approval under the WM Act is required for certain types of developments and activities that are carried out in or near a river, lake or estuary. Under section 91E of the WM Act, it is an offence to carry out a controlled activity in, on or under waterfront land unless a controlled activity approval has been issued. The Proposal would not involve any water use (directly from a natural source such as an aquifer, river), water management works, drainage or flood work, controlled activities or aquifer interference.

4.2.4 Key State Environmental Planning Policies

State Environmental Planning Policy (Transport and Infrastructure) 2021

The Transport and 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.

Section 2.91 of Transport and Infrastructure SEPP permits the development of ‘rail infrastructure facilities’ on any land on behalf of a public authority without consent. The definition of ‘rail infrastructure facilities’ under section 2.90 includes ‘associated public transport facilities for railway stations’ which is further defined in section 2.3 to include ‘car parks intended for use by commuters’.

The Proposal is classified as ‘rail infrastructure facilities’ and therefore does not require development consent. However, the environmental impacts of the Proposal have been assessed in accordance with Part 5, Division 5.1 of the EP&A Act.

Part 2.2, Division 1 of the Transport and Infrastructure SEPP prescribes the consultation to be undertaken with the Local Council and the relevant public authorities with regards to certain development. Section 5.2 of this REF discusses the consultation undertaken under the requirements of the Transport and Infrastructure SEPP.

The Transport and Infrastructure SEPP prevails over all other environmental planning instruments except where there is an inconsistency with Precincts SEPPs or certain provisions of *State Environmental Planning Policy (Resilience and Hazards) 2021*. The Proposal does not require consideration under these SEPPs and therefore do not require further consideration as part of this REF.

Relevantly, the Proposal also falls within an area regulated by the *State Environmental Planning Policy (Precincts – Western Parkland City) 2021* (Western Parkland City SEPP). However, the continued operation of the Transport and Infrastructure SEPP to the Proposal is provided for by clause 35 in Appendix 1 of the Western Parkland City SEPP, notwithstanding clause 2.7(2)(b) of the Transport and Infrastructure SEPP. Further discussion regarding the application of the Western Parkland City SEPP is provided below.

State Environmental Planning Policy (Precincts – Western Parkland City) 2021

The Precincts – Western Parkland City SEPP identifies State Significant precincts, which are areas with state or regional planning significance, and provides planning pathways and controls for those precincts.

Edmondson Park is deemed a State Significant Precinct under Appendix 1 of the SEPP. Therefore, the planning provisions prescribed by the Precincts – Western Parkland City SEPP apply in place of a Local Environmental Plan (in this case the *Liverpool Local Environmental Plan 2008*).

The Proposal is located within an area zoned under the Precincts – Western Parkland City SEPP as B4 Mixed Use. Clause 10, Appendix 1 of the Precincts – Western Parkland City SEPP identifies the provisions relating to development within the B4 Mixed Use as follows

10 Zone B4 Mixed Use

(1) The objectives of Zone B4 Mixed Use are as follows—

(a) to provide a mixture of compatible land uses,

(b) to integrate suitable business, office, residential, retail and other development in accessible locations so as to maximise public transport patronage and encourage walking and cycling.

(2) Development for any of the following purposes is permitted without development consent on land within Zone B4 Mixed Use—environmental protection works.

(3) ***Development for any of the following purposes is permitted only with development consent*** *on land within Zone B4 Mixed Use—boarding houses; business premises; centre-based child care facilities; community facilities; earthworks; educational establishments; entertainment facilities; function centres; hotel or motel accommodation; information and education facilities; office premises;* ***passenger transport facilities****; recreation facilities (indoor); registered clubs; retail premises; roads; seniors housing; shop top housing; any other development not specified in subclause (2) or (4).*

The Precincts – Western Parkland City SEPP adopts the definition of *'passenger transport facilities'* from the *Standard Instrument (Local Environmental Plans) Order 2006* as follows

> *'passenger transport facility means a building or place used for the assembly or dispersal of passengers by any form of transport, including facilities required for parking, manoeuvring, storage or routine servicing of any vehicle that uses the building or place.'*

The Proposal would fall under the definition of *'passenger transport facilities'* and would therefore be permissible with consent.

However, clause 35(1) in Appendix 1 of the Precincts – Western Parkland City SEPP provides that:

> *"This Appendix does not restrict or prohibit, or enable the restriction or prohibition of, the carrying out of any development that is permitted to be carried out with or without consent or that is exempt development under the State Environmental Planning Policy (Transport and Infrastructure) 2021."*

Accordingly, permissibility of the Proposal remains under the application of the Transport and Infrastructure SEPP, which provides for the works to be permissible without development consent and therefore assessable under Part 5, Division 5.1 of the EP&A Act.

Notwithstanding Table 7 summarises the relevant aspects of the Precincts – Western Parkland City SEPP which would otherwise be applicable to the Proposal. Figure 12 shows the relevant section of the zoning map from the SEPP, with the indicative location of the Proposal.

Table 7 Relevant provisions of the Precincts – Western Parkland City SEPP (Appendix 1)

Provision description	Relevance to the Proposal
Clause 18 - Height of buildings	The height of the building would be approximately 22 metres above the existing ground level and would not exceed the maximum height of 24 metres. However, as per Clause 35 discussed above, the Proposal which is for development of rail infrastructure facilities may be carried out without consent and is not restricted or prohibited from exceeding this development standard.
Clause 19 – Floor Space Ratio	The Proposal would exceed the floor space ratio of 2.5:1. However, as per Clause 35 discussed above, the Proposal which is for development of rail infrastructure facilities may be carried out without consent and is not restricted or prohibited from exceeding this development standard.
Clause 31 – Preservation of trees	There are no significant trees or vegetation on the site. Approximately 14 transient planted trees will need to be removed. Offset plantings will ensure that any vegetation removal is adequately compensated for in the detailed design.

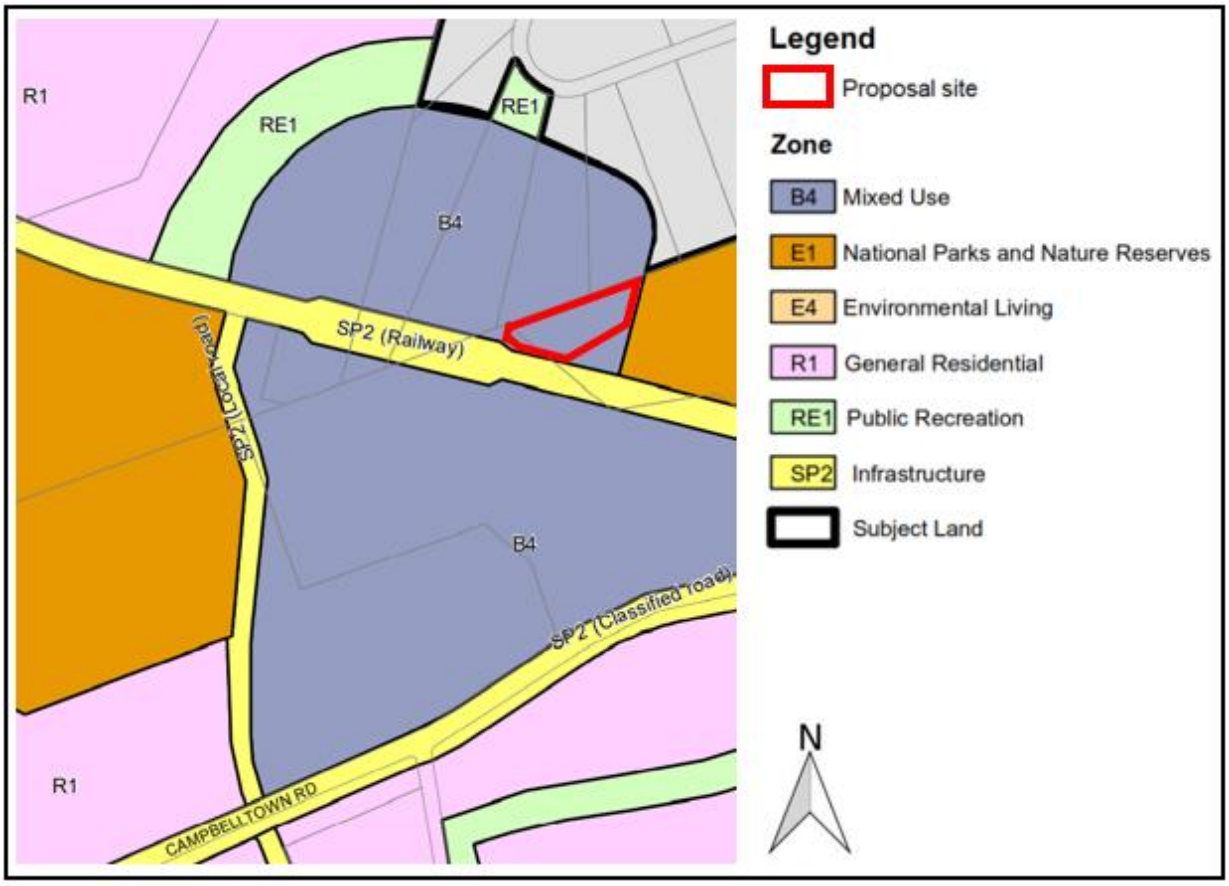

Figure 12 Precincts – Western Parkland City SEPP zoning map (Source:

State Environmental Planning Policy (Resilience and Hazards) 2021

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

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

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

State Environmental Planning Policy (Biodiversity and Conservation) 2021

Biodiversity and Conservation (SEPP) includes an aim to encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent, free-living population over their present range and reverse the current trend of koala population decline. The policy applies to the Proposal study area. However, Part 1, Clause 6(3)(c) specifies that this SEPP does not apply to land on which biodiversity certification has been conferred, and is in force, under Part 8 of the Biodiversity Conservation Act 2016. The land is confirmed as biocertified land (refer to Section 6.7), and as such the Koala Habitat Protection (SEPP) does not apply to the Proposal site.

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.

The potential for contaminated land and the potential impacts of the Proposal are assessed in Section 6.8 of this REF. It is unlikely that any large-scale remediation (Category 1) work would be required as part of the Proposal.

Greater Metropolitan Regional Environmental Plan No 2—Georges River Catchment

The aim of this plan is to protect the environment of the Georges River Catchment by ensuring that the impacts of future land uses are considered. The Proposal is located within a part of the Liverpool LGA managed by the Greater Metropolitan Regional Environmental Plan. The impact of the Proposal on receiving waters including the impacts of stormwater runoff, is considered in Section 6.9.

4.3 Ecologically sustainable development

Transport for NSW is committed to ensuring that its projects are implemented in a manner that is consistent with the principles of ecologically sustainable development (ESD). The principles of ESD are generally defined under the provisions of section 193 of 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 Edmondson Park Station (North) Commuter Car Park. Section 3.2.3 summarises how ESD has been incorporated in the design development of the Proposal. Section 6.13 includes an assessment of the Proposal on sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5 Community and stakeholder consultation

Chapter 5 discusses the consultation undertaken to date for the Proposal and the consultation proposed for the future. This chapter discusses the consultation strategy adopted for the Proposal and the key themes of feedback received from the community.

5.1 Stakeholder consultation during scoping design

As part of the scoping design development, Transport for NSW has been consulting with key stakeholders on the design option. Transport for NSW has had ongoing consultation with Liverpool City Council.

5.2 Consultation requirements under the Transport and Infrastructure SEPP

Part 2.2, Division 1 of the Transport and 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. Section 2.10, 2.11, 2.12, 2.13, 2.14 and 2.15 of the Transport and Infrastructure SEPP require that public authorities undertake consultation with councils and other agencies, when proposing to carry out development without consent.

Table 8 provides details of consultation requirements under the Transport and Infrastructure SEPP for the Proposal.

Table 8 Transport and Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Section 2.10 | Consultation with Councils – development with impacts on council related infrastructure and services	Consultation is required where the Proposal would result in: • substantial impact on stormwater management services • generating traffic that would place a local road system under strain • involve connection to or impact on a council owned sewerage system • involve connection to and substantial use of council owned water supply • significantly disrupt pedestrian or vehicle movement • involve significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes work that would: • require connections or impacts upon the stormwater system (minor), once the infrastructure is in place • disrupt pedestrian and vehicle movements • impact on road pavements under Council's care and control • impact on Council-operated footpaths. Consultation with Liverpool City Council has been undertaken and would continue throughout the detailed design and construction phases.
Section 2.11 | Consultation with Councils – development with impacts on local heritage	Where railway station 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 items. Therefore, consultation with Council is not required. Refer to Section 6.5.
Section 2.12 | Consultation with Councils –	Where railway station works: • impact on land that is susceptible to flooding – reference would be	The Proposal is not located on flood prone land. Accordingly, consultation

Clause	Clause particulars	Relevance to the Proposal
development with impacts on flood liable land	made to *Floodplain Development Manual: the management of flood liable land.*	with Council is not required in regard to this aspect.
Section 2.13 | Consultation with State Emergency Service – development with impacts on flood liable land	Where railway station works: • impact on flood liable land – written notice must be given (together with a scope of works) to the State Emergency Service. Any response to the notice received from the State Emergency Service within 21 days after the notice is given must be taken into consideration.	The Proposal is not located on flood prone land. Accordingly, consultation with the State Emergency Service is not required in regard to this aspect.
Section 2.14 | Consultation with Councils – development with impacts on flood liable land	Where railway station 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 aspect. Refer to Section 6.9.
Section 2.15 | Consultation with public authorities other than Councils	For *specified development* which includes consultation with the former Office of Environment and Heritage (OEH) for development that is undertaken adjacent to land reserved under the *National Parks and Wildlife Act 1974*, and other agencies specified by the Transport and Infrastructure SEPP where relevant.	The Proposal is not located adjacent to land reserved under the *National Parks and Wildlife Act 1974*. Accordingly, consultation with the OEH now the Environment, Energy and Science (EES) Group part of the Department of Planning, Industry and Environment (DPIE) on this matter is not required.
Section 2.121 | Consultation with Relevant roads authority	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 deemed a traffic-generating development as a car park with over 200 car parking spaces. Accordingly, consultation with the relevant division of Transport for NSW is required in regard to this aspect. Refer to Section 6.1.

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 to ensure 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 to relevant stakeholders and the community
- raise awareness of the various components of the Proposal and specialist environmental investigations
- ensure that the directly impacted community is aware of the key impacts of the Proposal and consulted where appropriate
- provide an opportunity for directly impacted stakeholders and commuters to express their view about the Proposal
- understand and access valuable local knowledge from the community and stakeholders
- record the details and input from community consultation activities
- build positive relations with identified community stakeholders
- ensure a comprehensive and transparent approach
- establish communication channels to enable stakeholders to be kept informed throughout the Proposal
- inform stakeholders about design changes, if required, and how input as a result of consultation has influenced Proposal outcomes.

5.4 Community consultation during REF

Community feedback on the concept design was invited between 25 February 2022 and 13 March 2022.

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

It is important for the community to have their say on all transport infrastructure projects and Transport for NSW is ensuring all appropriate community consultation is carried out.

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 COVID-19,

Community consultation activities undertaken included:

- 2900 flyers were letterbox dropped within the suburbs of Edmondson Park and Bardia
- development of a dedicated webpage and online feedback form for the project the Transport for NSW website – www.transport.nsw.gov.au/edmondsonpark
- invitation to provide feedback on the NSW Have Your Say website.
- geographically targeted social media advertisement via Facebook to inform the community of the proposed activity and invite their feedback online
- consultation with key stakeholders such as Liverpool City Council, Sydney Trains, and adjacent private land holders
- a letter outlining the scope of the Proposed Activity, along with details on how to make a submission was sent to Liverpool City Council as per the consultation requirements under Section 2.10, 2.11, 2.12, 2.13, 2.14 and 2.15 of the Transport and Infrastructure SEPP.

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.

The feedback received from the community regarding the Proposal during the consultation process has been categorised into the key themes in Table 9.

Table 9 Community feedback themes

Key themes of feedback	Response
Support for the project and requests to proceed as quickly as possible	Improving commuter parking at Edmondson Park Station is a priority for Transport for NSW. Construction of the multi-storey commuter car park is planned to begin in mid 2022 and is expected to be complete in late 2023.
Concerns regarding increased congestion in and around the station precinct.	Road access to the proposed car park would align with the Edmondson Park Masterplan. A detailed Traffic and Transport Impact Assessment (TTIA) has been completed during the assessment of the Proposal, which assessed the existing environment and impacts of the Proposal on the surrounding road, pedestrian and public transport network. The assessment also included interim and ultimate access arrangements following completion of the proposed road network to the north of the site and considered cumulative traffic impacts. The TTIA concluded that the road network performance indicates that all critical intersections around the site are forecast to operate at satisfactory levels of service. The provision of the 1,465 car parking spaces in the recently completed Edmondson Park (South) multi-storey commuter car park combined with the approximately 900 spaces proposed will reduce informal over-flow parking issues in the station precinct. As areas of the Edmondson Park South road network are still being planned and constructed, there are opportunities to modify planned precinct access arrangements to further reduce traffic congestion and improve pedestrian connectivity. During detailed design further consideration would be given to the following: • design of the access road from Soldiers Parade • pedestrian arrangements for connection to the station • intersection configurations of Soldiers Parade with Buchan Avenue and MacDonald Road Transport for NSW would continue to consult with Liverpool City Council during detailed design regarding any proposed road works.
Information around why the proposed location of the multi-storey car park was selected.	The car park location was identified following a selection process which also included the recently completed Edmondson Park (South) multi-storey commuter car park location. The selection process considered the needs of transport customers as well as future residents of the Edmondson Park Town Centre. All options considered in this process are outlined in Section 2.4 of this REF. While the site does have some limitation, the proposed location is considered the best outcome to meet the needs of both of these groups. With careful design considerations and pedestrian arrangements, it is within easy walking distance from the station

Key themes of feedback	Response
	for convenient access to public transport, future shopping, dining and entertainment facilities of the Edmondson Park town centre. The sites shape, configuration and proximity to the rail corridor, make the site less desirable and efficient for housing. The Proposal is on vacant land that is Biocertified, and without significant trees or vegetation. The development would not result in displacement of existing car parking spaces during construction and vegetation removal does not require assessment.
More information around pedestrian access (route, signalised crossings, lighting, potential for covered walkways and overpass on Soldiers Parade)	As a Condition of Approval (CoA), an Urban Design Plan (UDP) will be prepared for the Proposal and submitted to Transport for NSW for endorsement prior to finalising the detailed design. The UDP will address the fundamental design principles as outlined in the Transport for NSW Commuter Car Parks, Urban Design Guidelines. The UDP would be prepared based on the following six core urban design principles for the Commuter Car Park Program: • connect with and enhance the transport network • deliver a quality built form appropriate for the context • include quality landscaping • ensure sustainable design outcomes • enhance the public realm • allow for future growth Pedestrian access requirements have been considered in detail during this REF process and will continue to be refined. During detailed design the following will be considered: • The provision of an unsignalised pedestrian crossing on the Proposal access road • A signalised pedestrian crossing on the north approach of the Soldiers Parade / Henderson Road intersection which would facilitate safe, formalised pedestrian access between the Proposal and the station • Pedestrian fencing in the existing median along Soldiers Parade north of Henderson Road which would improve pedestrian safety in the vicinity of the site • wayfinding signage and lighting. A covered walkway is not considered viable within the project scope or a desired urban design outcome. An appropriate safe pedestrian access can be provided to the station via the footway network, without an overpass to Soldiers Parade. Transport for NSW would continue to consult with Liverpool City Council during detailed design regarding pedestrian and cycle access requirements.
Concern that 700 spaces will not cater for future demand.	Transport for NSW is aware that customers in Sydney's South West have been calling for more commuter car parking. In 2019, the NSW Government committed to delivering an extra 700 spaces at Edmondson Park Station, and after further site investigations and planning, up to 2,000 spaces were announced. Liverpool LGA is one of the fastest growing regions in Sydney. Experiencing substantial growth from urban release

Key themes of feedback	Response
	development and from redevelopment in established areas, its population is expected to almost double to more than 320,000 over the next 20 years. The newly completed Edmondson Park (South) multi-storey commuter car park provides over 1,250 additional parking spaces for transport customers and the Proposal will provide a net increase of approximately 700 parking spaces, which is designed to accommodate existing, and anticipated growth in customer parking demand. Both the Edmondson Park Station (South) multi-storey commuter car park and the Proposal would be built using a flexible and adaptable design that would allow for future opportunities to increase capacity if required. Transport for NSW is planning for future growth in South West Sydney through a range of integrated road and public transport improvements identified as part of *Future Transport 2056*. Improvements to several bus services in the South West include additional services on routes 869 serving Edmondson Park. Transport for NSW has also improved commuter parking at neighbouring Leppington Station, with over 1,000 additional spaces recently completed. Transport for NSW will continue to monitor how our customers move around the south-west region, and will consider further transport initiatives such as active transport links, bus and on-demand transport services to cater for demand and provide customers with more choice in how they travel.
Bicycle access and secure bicycle parking	There are currently 40 bicycle parking spaces near the station entrances on the northern and southern access roads fronting the station which consist of one sheltered bicycle parking area and three unsheltered bicycle parking areas. Bicycle parking is ideally placed as close as possible to the station, and so is not a priority to be located at this Proposal.
Information around what will happen to the current at-grade temporary parking to the north of the station	The existing at-grade car park with approximately 200 spaces, north of the station, would remain free and untimed as it is now until completion of the Proposal. At completion of the Proposal, it will be decommissioned and closed to public. The Proposal will provide a net increase of approximately 700 commuter car spaces available in the Edmondson Park precinct when the at-grade car park is closed. The existing at-grade car park is zoned for mixed use development. The NSW Government is considering the future use of the site to deliver improved place and town centre outcomes, contributing to the Edmondson Park Masterplan vision for a transit-oriented community.
More information about Transport Park&Ride (hours, usage terms, signage)	The concept design for the multi-storey 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 or a contactless credit/debit card linked to Transport Connect. Charges would apply after 18 hours. These arrangements are in place to discourage long term parking and ensures spaces are freed up for commuters using public transport.

Key themes of feedback	Response
	The car parks are for commuters and not intended for short or long term users of the Edmondson Park Town Centre. Transport for NSW would investigate further signage to ensure that commuters entering the car park are fully aware of the Park&Ride terms of use.
Deterring misconduct/unauthorised activities	The Proposed Activity has been designed having regard to a range of design standards including Crime Prevention Through Environmental Design (CPTED) and aims to provide improved safety and security infrastructure, and pedestrian and driver safety. The Proposed Activity includes an improved customer experience by providing modern car parking facilities with weather protection for the majority of parking spaces and security features including lighting and CCTV cameras. Boom gated entry and exit, CCTV, permanent lighting, and the Park&Ride requirements for use of the commuter car park would discourage unauthorised activities within the car park.
Incorporating more greenery into the design, quality to be similar to that of Edmondson Park north and providing adequate visual screening through engineering	As Conditions of Approval (CoA), both an Urban Design Plan (UDP) and a Landscape Design Plan (LDP) will be prepared for the Proposal and submitted to Transport for NSW for endorsement prior to finalising the detailed design. The UDP and LDP will address: • a comprehensive landscape design approach including design of pedestrian and bicycle pathways, street furniture, interchange facilities, new planting and opportunities for public art • materials and finishes for proposed built works, colour schemes, paving and lighting types for public domain, fencing and landscaping Disturbance of vegetation would be limited to the minimum amount necessary to construct the car park, and considerations in the LDP would include: • retain existing trees along the western boundary of the Proposal site to soften the façade and break up the extent of hard surfacing/built structures when viewed from the station and town centre • supplement existing tree planting along the western boundary for the 14 trees that would require removal during construction to maintain a dense, vegetated screen of lower floor levels • retain existing trees along the northern boundary of the Proposal site to screen the lower floor levels of the Proposal. • include feature tree planting around the Proposal, particularly along the southern boundary, to soften the building when viewed from the town centre and provide amenity and shade for pedestrians moving between the car park and the Station
Other requests received include: • Increase the EV charging stations at the Edmondson	The Proposal includes provision for EV charging stations. The Proposal is focused on the provision of additional commuter car parking. The setting of train fares is outside the scope of this Proposal.

Key themes of feedback	Response
Park (South) multi-storey commuter car park • Fees are too expensive • Why can't multi-storey car parks be built over railway stations • Need to complete connection from Leppington to Western Sydney Airport. • Need to improve the efficiency and safety of the current Kiss&Ride	The Proposal site was chosen following the outcome of a scoping exercise and multi-criteria analysis. Construction of a multi-storey car park over the railway station would be at significant additional cost and disruption to the SWRL, making the Proposal unviable. Rail connection projects are outside the scope of this Proposal. Changes to the current Kiss&Ride are not specifically included in the scope of this Proposal. However, TfNSW will consider overall vehicle and pedestrian connectivity to the station as part of the detailed design process. This feedback will also be passed onto the relevant department within TfNSW for consideration in future planning.

5.5 Ongoing consultation

Key themes raised by respondents have been addressed in Table 9 of this REF. Should Transport for NSW determine to proceed with the Proposal, the Determination Report would be made available on the Transport for NSW website including any conditions of the determination.

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. Further consultation with the community would be undertaken in accordance with a Community Liaison Management Plan to be developed prior to the commencement of construction.

6 Environmental impact assessment

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 section 171 of the EP&A Regulation. A checklist of section 171 factors and how they have been specifically addressed in this REF is included at Appendix B.

6.1 Traffic and transport

A Traffic and Transport Impact Assessment (TTIA), which assessed the existing environment and impacts of the Proposal on the surrounding road, pedestrian and public transport network was prepared by SCT Consulting in April 2022.

It is noted that this analysis is based on background traffic volumes prior to COVID-19 to best reflect baseline 'business as usual' traffic conditions at the site.

6.1.1 Existing environment

The Proposal site is located in the Edmondson Park interchange precinct, which provides people with the opportunity to access and transfer between transport modes including train, bus, bicycle and private vehicle. The Proposal site is located east of Soldiers Parade, approximately 120 metres from the northern entrance to Edmondson Park Station.

Edmondson Park Station and interchange facilities

Edmondson Park Station is located on the western side of Soldiers Parade. The station is serviced by the T2 Inner West and Leppington Line and the T5 Cumberland Line, providing train services between Richmond, Parramatta and the Sydney CBD. Between 6.00 am and 7.00 am, a service departs Platform 1 on average every five to six minutes. A review of Edmondson Park Opal data for May and August 2019 recorded an average of 1,900 station entries and exits during the morning weekday peak period.

There are 40 bicycle parking spaces near the station entrances on the northern and southern access roads fronting the station which consist of one sheltered bicycle parking area and three unsheltered bicycle parking areas.

A formal kiss and ride area is provided at Edmondson Park Station along its northern frontage with capacity for approximately 18 cars. Due to the over-subscription of the adjacent Park&Ride facilities, it is common for the kiss and ride facility to be blocked with illegally parked commuter vehicles.

A taxi rank is provided on the northern side of Henderson Road which has a capacity for approximately six taxis.

A bus interchange facility is located on the south side of the station at the eastern end of Henderson Road. The three bus service routes 859, 868 and 869 currently operate through the Edmondson Park Station interchange.

Additionally, on-demand services provide flexible public transport services between Edmondson Park Station and the Edmondson Park Estate, to the north of the station, extending up to Camden Valley Way.

Parking

Edmondson Park interchange precinct currently contains approximately 1780 commuter car parking spaces including:

- north at-grade commuter car park: 195 spaces
- on-street parking: 120 spaces.
- Edmondson Park Station (South) Commuter Car Park was completed in early 2022 and provides a total of 1,465 spaces, which is an additional 1,250 spaces to that which was previously provided by an at-grade car park in the same location.

In addition to the on-street parking included above, several parking spaces have also been line-marked on MacDonald Road as a temporary measure to provide additional parking spaces.

Prior to the opening of Edmondson Park Station (South) Commuter Car Park, the commuter car parking facilities at the Station were not meeting the demand, which led to parking overspill into adjacent roads and illegal parking practices within the precinct. The Proposal is planned to meet future commuter parking needs.

Pedestrian

Pedestrian access to the existing at-grade commuter car parks north of the station and the Edmondson Park Station (South) Commuter Car Park is provided via footpaths to the south and north of the station. These footpaths are along Henderson Road and the unnamed road to the north of the station and include raised pedestrian crossings, providing a link between the car parks and the station entrances.

Overall, the pedestrian connectivity to Edmondson Park Station is poor because, with the exception of the town centre to the south, the surrounding area to the north, east and west is largely undeveloped. A signalised crossing is provided on the western approach of Henderson Road at Soldiers Parade. This is the only pedestrian approach to the station with a formal signalised pedestrian crossing facility. There are currently no east-west pedestrian crossing facilities across Soldiers Parade that would link the Proposal to the station.

Road network

As described in Section 1.3.2, Edmondson Park is a major land release area which is undergoing significant development. The area around the station has an approved concept plan for development. As part of that concept plan, a road network was proposed as shown in Figure 13. As the area is undergoing construction, only some of the roads have been constructed or have a development application approved.

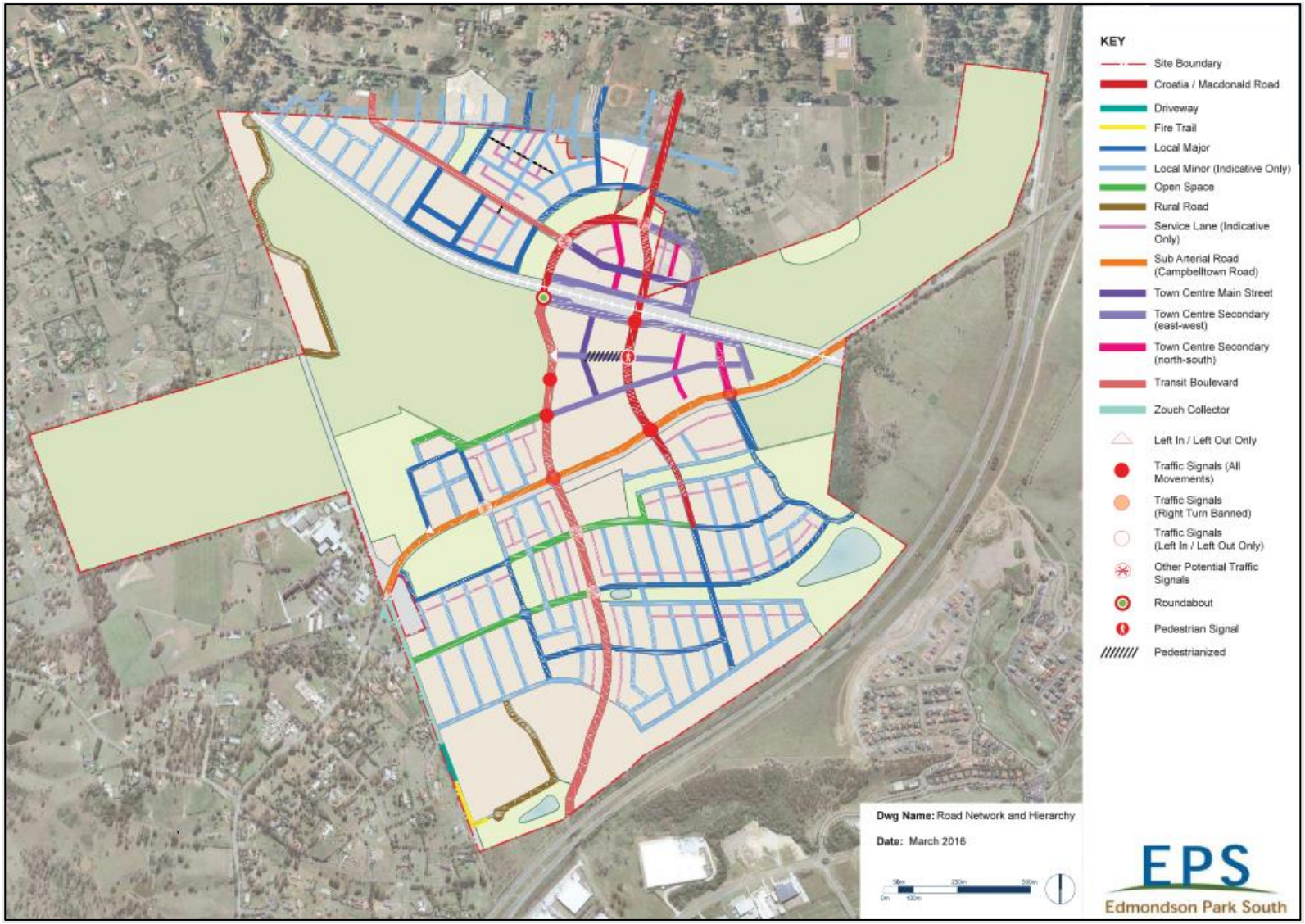

Figure 13 Planned road network under the Edmondson Park South Concept Plan (Frasers Property 2018).

The existing road network near the Proposal site include Soldiers Parade, Campbelltown Road, Camden Valley Way and the Hume Highway. The road access network of the Proposal site and Edmondson Park Station is shown in Figure 14 below.

In addition to Soldiers Parade, the local road network being developed around Edmondson Park Station and the Proposal includes Henderson Road, MacDonald Road, a proposed extension of Buchan Avenue, and unnamed roads along the north side of Edmondson Park Station and to the south of the Proposal site (refer Figure 16 further below).

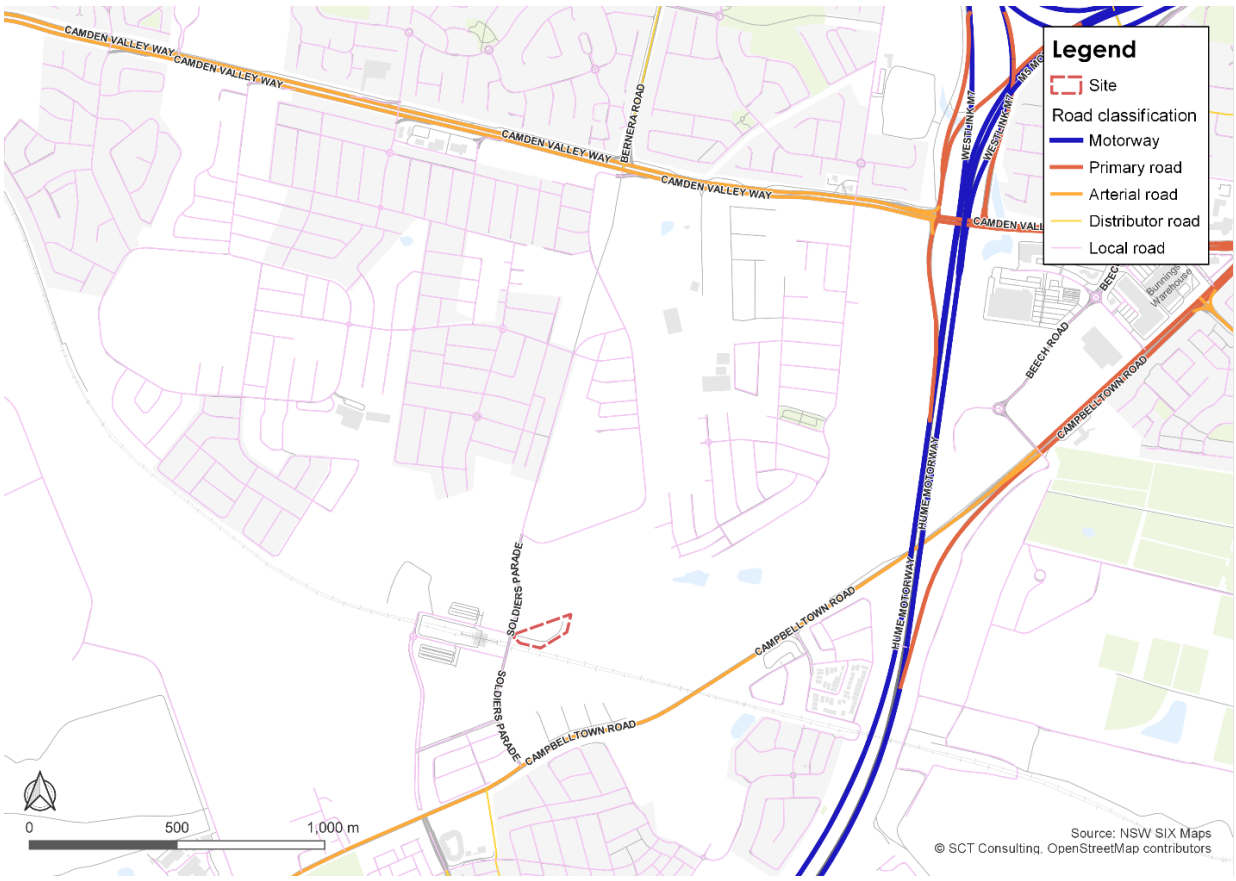

Figure 14 Road access network (Source: SCT Consulting, 2022)

Soldiers Parade

Soldiers Parade is a north-south local road connecting Edmondson Park to the State Road arterial network at Camden Valley Way to the north and Campbelltown Road to the south. It is the main access road to the station precinct and is located immediately to the east of the station and immediately to the west of the Proposal site. It generally provides one through traffic lane in each direction with turning lanes for access to and from the station. Near the station and approaching the State Road network, it widens to a dual carriageway.

Campbelltown Road

Campbelltown Road is an east-west State Road (MR177), which is currently undergoing a major upgrade. Transport for NSW is upgrading Campbelltown Road between Hume Highway/Camden Valley Way, Casula and Brooks Road, Denham Court. Stage 1 of this upgrade, between East Town Centre Road and the newly realigned MacDonald Road, was completed in 2020.

Camden Valley Way

Camden Valley Way is an east-west State Road located to the north of Edmondson Park. It is a major transport route for communities in Sydney's South West Growth Centre, linking the

Hume Highway and the Westlink M7 and M5 Motorway interchanges at Prestons with Camden, Narellan and Liverpool.

Henderson Road

Henderson Road is the southern access road to Edmondson Park Station. Henderson Road connects MacDonald Road, east of the station, to Soldiers Parade, west of the station. The Edmondson Park Station (South) Commuter Car Park is located on the southern side of Henderson Road.

Buchan Avenue

The proposed Buchan Avenue extension north of the station has development approval. The road would connect to Soldiers Parade.

MacDonald Road

MacDonald Road is a north-south road on the western edge of the Edmondson Park Town Centre. MacDonald Road currently terminates at the western end of the unnamed road to the north of Edmondson Park Station, but it is proposed to extend MacDonald Road in an arc to the north to join Soldiers Parade.

Unnamed roads

The northern station access road along the northern side of Edmondson Park Station, between MacDonald Road and Soldiers Parade, is currently unnamed.

The access road to the Proposal site off Soldiers Parade, which currently provides access to the SWRL substation is not yet gazetted as public road and currently unnamed.

Road network performance

Performance of key intersections providing access to Edmondson Park were modelled and assessed in terms of the following:

- **degree of saturation (DoS)** - The ratio of arrival (demand) flow rate to capacity of the intersection during a given flow period. Acceptable intersection performance requires a DoS less than 1.0.
- **level of service (LoS)** - An index of the operational performance of traffic at an intersection during a given flow period. Acceptable intersection performance normally requires a minimum of LoS D where an average delay per vehicle is 42.5 to 56.4 seconds. [Note: LoS A = good operation, B = good with acceptable delay and spare capacity, C = satisfactory, D = operating near capacity, E = At capacity, incidents will cause excessive delays, roundabouts require other control measures]
- **average vehicle delay** -The delay experienced by a vehicle crossing a signalised intersection.

With the surrounding road network still under development, the Proposal site was assessed under:

- **an interim access arrangement** where the intersection of Soldiers Parade, the northern station access road, and the Proposal access road is median-divided with the east and west halves of the intersection operating independently of each other as left-in / left-out (LILO) intersections (refer Table 10)
- **future base intersection performance** where Buchan Avenue has been constructed to an intersection with Soldiers Parade, and the Edmondson Park Station (South) Commuter Car Park is operational providing an additional 1258 parking spaces (refer Table 11).

Table 10 Existing intersection performance (2019) – with Buchan Ave and South Commuter Car Park still to be constructed (Source SCT Consulting, 2022)

Intersection	Morning Average delay (sec)	Morning LoS	Morning DoS	Evening Average delay (sec)	Evening LoS	Evening DoS
Soldiers Parade and the northern station access road (Give-way)	4.4	A	0.25	4.4	A	0.25
Soldiers Parade and Henderson Road (Signals)	21.4	B	0.62	21.6	B	0.55
Soldiers Parade and Campbelltown Road (Signals)	39.3	C	0.80	35.0	C	0.89

Table 11 Future base intersection performance (2023)– with Buchan Ave constructed and South Commuter Car Park operational (Source SCT Consulting, 2022)

Intersection	Morning Average delay (sec)	Morning LoS	Morning DoS	Evening Average delay (sec)	Evening LoS	Evening DoS
Soldiers Parade and Buchan Avenue (Give-way)	8.4	A	0.52	9.4	A	0.43
Soldiers Parade and the northern station access road (Give-way)	4.4	A	0.25	4.4	A	0.24
Soldiers Parade and Henderson Road (Signals)	42.4	C	0.87	38.1	C	0.84
Soldiers Parade and Campbelltown Road (Signals)	41.2	C	0.82	37.4	C	0.91

The assessment scenarios show that in the absence of the Proposal, the intersections in the surrounding road network for both the interim and future base scenarios are performing at a satisfactory or better LoS.

6.1.2 Potential impacts

Construction phase

Parking

The Proposal site is currently undeveloped and construction on the site would not directly impact existing parking spaces or require offset parking to be provided.

The activities associated with construction of the car park are expected to require a maximum daily workforce of up to 80 workers per day. Although the site is conveniently located near a train station, it is expected that part of the workforce may choose to travel to the site daily by private vehicle. Assuming that 40 per cent of workers choose to travel to the site daily by private vehicle, with an occupancy rate of 1.5 workers per vehicle, the increased demand for parking could be up to 21 car parking spaces. This peak impact would be during construction of the car park structure which would be approximately a 20-week period

While construction staff would be encouraged to use public transport, wherever practicable, and advised not to use the commuter car parks, a combination of site parking and the new Edmondson Park Station (South) Commuter Car Park which is now operational, should be sufficient to accommodate any parking demand with minimal disruption to commuters.

Road network

Construction traffic would access the site via the intersection of Soldiers Parade and the Proposal site access road. Deliveries to and from the site would peak at an estimated 60 trucks per day, during the concrete pours and would be spread evenly throughout the day (7 to 8 trucks per hour). Wherever possible, deliveries would be scheduled outside peak commuter periods.

Due to the low traffic volumes on Soldiers Parade, which currently peak at around 650 vehicles per hour (two-way), the site access point should perform at acceptable levels of service under the combined impact of deliveries (7-8 trucks per hour) and workforce trips (21 cars per hour). The combined construction movements likely represent less than a four per cent increase in intersection traffic during peak periods.

Bus operations

Construction of the Proposal is unlikely to impact bus stop operations as the bus stops are located remote from the work site.

As discussed above, construction traffic is unlikely to significantly impact the efficient operation of the road network and bus operations on Soldiers Parade.

Taxi and kiss and ride operations

Construction of the Proposal is unlikely to impact taxi and kiss and ride operations due to both the taxi rank and kiss and ride facilities being located adjacent to Edmondson Park Station and remote from the Proposal site.

Pedestrian and cycle access

Pedestrian and cyclist access to Edmondson Park Station is unlikely to be impacted due to the Proposal site being remote to the station. However there is currently no east-west access in the vicinity of the Proposal along Soldiers Parade from the Proposal site to Edmondson Park Station. This would impact the ability of workers to access the site from public transport and to access the Edmondson Park Town Centre.

Safe pedestrian access would need to be introduced between the Proposal site and Edmondson Park Station. Subject to detailed design and consultation with relevant stakeholders, it is proposed to provide:

- A pedestrian crossing on the Proposal Access Road. This would be an unsignalised marked crossing that would be located about 45 metres from the Soldiers Parade road reserve boundary to provide for safe sight distance at the crossing
- A signalised pedestrian crossing on the north approach of the Soldiers Parade / Henderson Road intersection
- Pedestrian fencing in the existing median along Soldiers Parade, north of Henderson Road, to stop unsafe, informal crossing of Soldiers Parade.

The impacts of these pedestrian access arrangements have been addressed in both the interim and future-based intersection performance modelling for the Proposal addressed in the operational impacts below.

The Traffic Impact assessment recommends that the signalised crossing of Soldiers Parade be constructed early in the construction program to allow workers to safely cross Soldiers Parade during the construction period. If this is not feasible, then consideration for safe crossing of Soldiers Parade by construction staff would be included in the Construction Traffic Management Plan.

The Proposal schematic in Figure 15 depicts a likely compliant solution for pedestrian access, represented by the solid pink line.

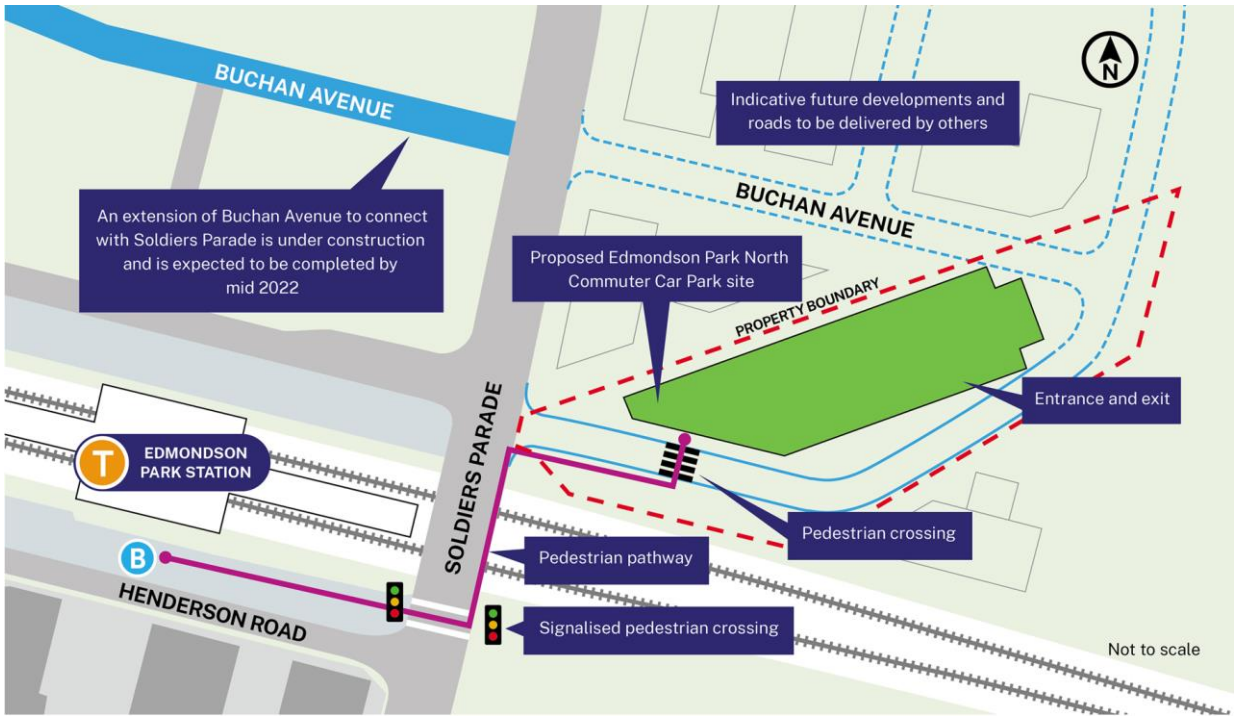

Figure 15 Potential pedestrian access (Source TfNSW, 2022)

Substation access

The substation can be accessed via the LILO intersection of Soldiers Parade and the Proposal access road. Deliveries and construction equipment (e.g. cranes) may temporarily utilise areas of the existing access road. Provisions to ensure unrestricted access to the substation at all times would be addressed under a Construction Traffic Management Plan (CTMP).

Operation phase

Parking

The Proposal would increase commuter car parking capacity at the station by approximately 700 spaces. This is expected to reduce informal over-flow parking issues throughout the precinct.

The proposed car park would be equipped with Opal Card Park & Ride controlled boom-gate access points.

Introduction of a parking management system is being investigated to provide real-time advice to users on the availability of parking spaces across the precinct, which would reduce unnecessary circulation between different commuter car parking areas.

Provision of electric vehicle charging stations, which would encourage more sustainable electric private vehicles.

Access to the proposed car park

Operational access to and from the proposed car park is proposed via an interim access arrangement and an ultimate access arrangement, once the local road network for Edmondson Park Town Centre is complete.

During the proposed interim access arrangement for operation, all vehicles accessing the site would be from the north via a LILO arrangement from Soldiers Parade. Traffic from the south would have no route to the Proposal and would have to be accommodated in the Edmondson Park Station (South) Commuter car park. Vehicles exiting the Proposal site and wishing to travel north would turn left at the LILO intersection, travel south on Soldiers Parade, and use the roundabout at the intersection of Soldiers Parade and General Boulevard to turn around and head north on Soldiers Parade.

Under the proposed ultimate access arrangement for operation, vehicles accessing from the north would travel south on Soldiers Parade to access the LILO intersection to the Proposal site. While vehicles from the south could theoretically use the planned extension of MacDonald Road to access the Proposal, they would be travelling past the larger Edmondson Park Station (South) Commuter Car Park and would therefore be likely to use that instead. Vehicles exiting the Proposal site and wishing to travel north could now use the planned signalised intersection of Soldiers Parade and the MacDonald Road extension to head north, in addition to still having the option to turn left at the LILO intersection, travel south on Soldiers Parade and use the roundabout at the intersection of Soldiers Parade and General Boulevard to turn around and head north on Soldiers Parade.

The proposed ultimate access arrangement is depicted in Figure 16.

Figure 16 Proposed ultimate traffic access arrangements during operation (Source: SCT Consulting, 2022).

Traffic generation

For a worst-case scenario based on 923 parking spaces proposed in the concept design for the Edmondson Park Station (North) Commuter Car Park, and using Opal 2019 data from Edmondson Park Station it is predicted the Proposal would generate approximately:

- 388 inbound trips during the morning peak hour (7.00 am to 8.00 am)
- 323 outbound trips during the evening peak hour (6.00 pm to 7.00 pm).

To minimise queuing at proposed car park entry and exit points, the boom gates required to service all arrivals and departures in the peak periods are two entry and two exit boom gates, which are included in the Proposal.

Road network performance

The performance of key intersections with and without the additional traffic generated by the new car park was considered under the interim access arrangements. The analysis of the performance of the intersections during peak morning and evening periods with the Proposal would remain acceptable with a LoS rating of D or better as outlined in Table 12, with some reserve capacity to accommodate future growth.

Table 12 Existing and operational intersection performance (Source: SCT Consulting, 2022)

		Morning Peak			Evening Peak		
Intersection	Proposal scenario	delay (sec)	LoS	DoS	delay (sec)	LoS	DoS
Soldiers Parade and Buchan Avenue	Without	8.4	A	0.52	9.4	A	0.43
	With	8.4	A	0.70	11.3	A	0.50
Soldiers Parade and the northern station access road	Without	4.4	A	0.25	4.4	A	0.24
	With	4.4	A	0.25	4.4	A	0.42
Soldiers Parade and Proposal access road	Without	-	-	-	-	-	-
	With	5.4	A	0.28	6.4	A	0.25
Soldiers Parade and Henderson Road	Without	42.4	C	0.87	38.1	C	0.84
	With	45.8	D	0.82	53.2	D	0.91
Soldiers Parade and Campbelltown Road	Without	41.2	C	0.82	37.4	C	0.91
	With	40.6	C	0.81	36.8	C	0.93

The impact of the increase in U-turn movements occurring at the roundabout intersection of Soldiers Parade and General Boulevard from the 323 peak outbound vehicles was assessed using forecast 2026 cumulative traffic volumes as a worst case scenario. The roundabout was forecast to operate at LoS A during the PM peak.

Finally, the performance of key intersections was considered under the ultimate access arrangements with both project and future network and precinct development in a 2026 cumulative scenario. Projected future development including proposed modifications to the Edmondson Park Town Centre Concept Plan, which if approved will see significant increases in residential dwelling yield, gross floor area and increased school site area. For this 2026 cumulative scenario the network appears to operate at an acceptable level of service (LoS D or better) as outlined in Table 13.

Table 13 2026 cumulative intersection performance (with project and future network and precinct development) (Source: SCT Consulting, 2022)

		Morning Peak			Evening Peak		
Intersection	Control type	delay (sec)	LoS	DoS	delay (sec)	LoS	DoS
Soldiers Parade and Buchan Avenue	Give-way	9.6	A	0.53	10.3	A	0.30

Soldiers Parade and the northern station access road	Give-way	4.4	A	0.22	4.4	A	0.49
Soldiers Parade and Proposal access road	Give-way	4.9	A	0.27	5.1	A	0.13
Soldiers Parade and Henderson Road	TCS	50.3	D	0.93	46.4	D	0.92
Soldiers Parade and Campbelltown Road	TCS	38.8	C	0.82	34.2	C	0.77

Decommissioning impacts

Decommissioning of the existing at grade car park with approximately 200 spaces will likely involve the removal of lights and installation of fencing around the site to prevent access. The volume of traffic generated by the decommissioning of the at grade car park is likely to be less than that generated during the construction and operation phases of the Proposal. Therefore, the impacts are also expected to be less, and no additional mitigation measures would be required

6.1.3 Mitigation measures

A Construction Traffic Management Plan (CTMP) and associated Traffic Control Plans (TCP) and Pedestrian Management Plans (PMP) would be prepared prior to commencement of construction to address the potential impacts identified in this REF and the TTIA.

During detailed design consideration would be given to the following:

- an unsignalised pedestrian crossing on the Proposal Access Road and a signalised pedestrian crossing on the north approach of the Soldiers Parade / Henderson Road intersection are provided. The unsignalised marked crossing is to be located 45 metres from the Soldiers Parade road reserve boundary to provide for safe sight distance at the crossing
- Pedestrian fencing in the existing median along Soldiers Parade north of Henderson Road to be provided to improve pedestrian safety in the vicinity of the site.

Refer to Chapter 7 for the full list of proposed mitigation measures for the Proposal.

6.2 Landscape and visual amenity

A Landscape Character and Visual Impact Assessment (LCVIA) was undertaken by Envisage Consulting for the Proposal (Envisage, 2021). The findings of this assessment are summarised in this section.

6.2.1 Existing environment

Edmondson Park Station was inspected 17 December 2019 during preparation of Edmondson Station (South) Commuter Car Park Landscape Character and Visual Impact Assessment (Envisage Consulting, May 2020). An additional, more recent site inspection was not undertaken for this assessment due to COVID-19 restrictions.

As the area around Edmondson Park Station has undergone significant development since the late 2019 site inspection, aerial photography and photographs from Transport for NSW and SNC-Lavalin were used to support the earlier visual site inspection.

Landscape character

The existing landscape is undergoing rapid and significant re-development. The low-density rural character of the area is in the process of changing to a high-density urban form. Very little of the existing rural character would be retained under the planned Edmondson Park Town Centre development.

Existing landscape character

Figure 17 presents a collection of images which illustrate the existing landscape character of the vicinity. The area is typified by:

- generally flat to gently sloping landform
- large vacant, grassed lots surrounded by security fencing or construction hoarding
- new multi-storey buildings (including the town centre development, residential buildings to the north and south of the Station, and the new multi-storey commuter car park under construction)
- new public amenities including roads, road infrastructure, rail infrastructure (Edmondson Park Station) and public domain areas with paved footpaths, street trees, seating, and signage)
- large, sealed at-grade car parking near the Station
- large stockpiles of gravel
- construction activity
- landscaped and self-seeded trees and existing stands of tall, native vegetation.

Future landscape character

Landscape character is evolving with ongoing development. Under the former State Significant Precincts SEPP (now SEPP (Precincts-Western Parkland City) 2021), the town centre, existing commuter car parks, and the Proposal site are zoned B4 Mixed Use. Vacant land within the mixed use zone is planned for high density residential development with buildings up to 24 metres high. At ground level there would be a mixture of shops, offices, and institutional premises, with the upper floors mostly apartments.

Future landscape character will be urban, with tall buildings, ground level shops, street trees, integrated public spaces and an emphasis on pedestrian and cyclist facilities. High-quality built form and public space is intended.

New developments within Edmondson Park town centre are guided by design principles within Edmondson Park South Development Control Plan (DCP) 2012. While the controls in this DCP do not directly apply to this Proposal by Transport for NSW, the principles of the DCP have been considered as they establish the desired landscape character of the area. The DCP sets out detailed planning controls for land use and development patterns, streetscape and urban character, subdivision design, building form, open space and landscaping, water management and transport. DCP 2012 design principles relevant to the Proposal are described in Section 6 of the Landscape Character and Visual Impact Assessment (Envisage Consulting, 2022).

Figure 17: Selection of photographs that collectively illustrate local landscape character (Source: Envisage Consulting, 2022 with photographs from TfNSW, 10 September 2021)

Visual receivers

The eastern end of the Proposal would be around 22 metres above the existing ground level, and the western end around 17 metres above the ground level (in the vicinity of Soldiers Parade). The approximate extent of visibility of the Proposal is shown in Figure 18. The viewshed is quite small - limited by existing tall vegetation (estimated at 12-16 metres high) and existing multi-storey buildings. The viewshed extends to the Station, town centre, and vacant land to the north and south of the Proposal site that is scheduled for development.

Representative viewpoints

Within the viewshed, viewpoints (VPs) have been selected and assessed in detail in the LCVIA. Viewpoints VP1 – VP4 (locations shown in Figure 18) represent a range of existing views of the Proposal.

As the area is rapidly changing, viewpoints have also been selected to represent the range of future views of the Proposal limited by planned land use and approved maximum building heights. Future views would be available from planned residential buildings to the north-west, north and south of the Proposal site, and are shown in Figure 18 as VP5, VP6 and VP7.

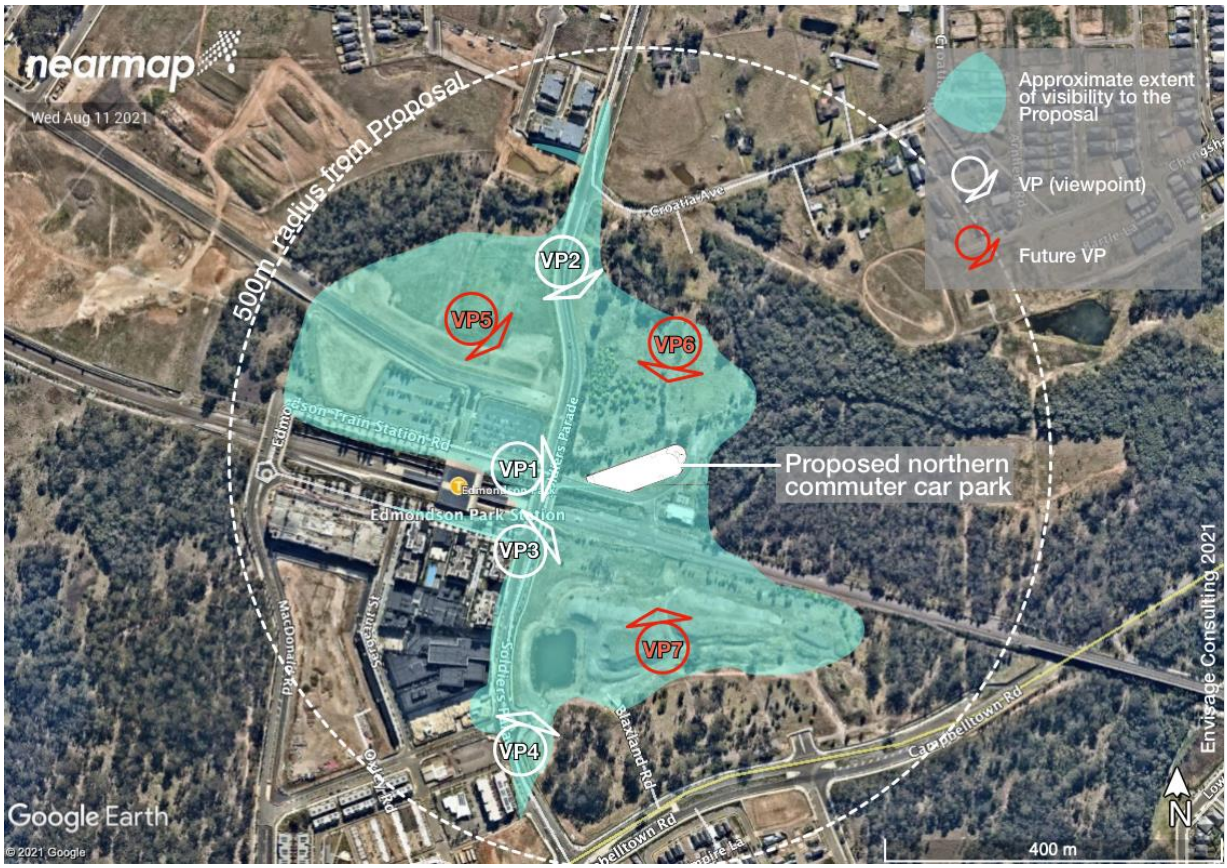

Figure 18: Approximate viewshed (500 metre radius context) (Source: Envisage Consulting, 2021)

6.2.2 Potential impacts

Construction phase

Temporary works associated with construction of the car park would include the use of plant and equipment (including excavators, cranes, and trucks), establishment and operation of a site compound, stockpiling of materials and removal of existing vegetation. These changes would be temporary and therefore would not have a long term visual impact on the existing or future landscape character.

Operation phase

Due to the rapidly changing nature of the landscape around the Proposal site, the impact on landscape character has been assessed in terms of the planned development of Edmondson Park. The eastern end of the Proposal would be around 22 metres above the existing ground level, and the western end around 17 metres above the ground level (in the vicinity of Soldiers Parade). Although this Proposal for infrastructure is not restricted by the development standards within the State Environmental Planning Policy (Precincts—Western Parkland City) 2021, by virtue of Section 35, it is within the planned maximum building height for the town centre of 24 metres and consistent with the future (urban) landscape character.

The viewpoints have been assessed in accordance with Transport for NSW's *Guideline for Landscape Character and Visual Impact Assessment, Environmental Impact Assessment Practice Note EIA-N04* (Transport for NSW, 2020) (referred to hereafter as the 'Guideline'). 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. The findings of the assessment for each viewpoint are shown in Table 14.

Table 14 Summary of visual impacts on viewpoints (VP)

Viewpoint	Description	Visual sensitivity	Magnitude of change	Visual impact	Overall impact
VP1 - from Edmondson Park Station	A public viewpoint representative of views available to commuters accessing the ground level Station forecourt.	Low	Moderate	The proposed car park would be bulky, tall (around 17 metres above the level of Soldiers Parade) and relatively close to viewers (around 50 metres at its closest) A few small existing trees, located along the north-western boundary of the Proposal site would be removed during car park construction. However, remaining trees alongside Soldiers Parade would screen the lower floor levels of the car park and soften the Proposal facade. The trees would screen more of the car park over time as they mature. The proposed car park would not greatly contrast the future surroundings, being similar in terms of height and scale as planned development.	**Moderate-low**
VP2 - from Soldiers Parade travelling south	A 'linear' public viewpoint (that is, the view changes as the viewer moves through the landscape). VP2 represents the views of road users accessing Soldiers Parade travelling south. It is also representative of views from existing residential buildings located to the north and north-west of the viewpoint.	Low	Low	The Proposal would be visible but not adversely affect the existing view. The Proposal would be largely screened by existing vegetation alongside Soldiers Parade, and future development to the north would further limit views. The view does not contain features of high scenic value and the town centre buildings would remain taller and the focal point of views	**Low**
VP3 - from town centre multi-storey building	This represents the private view of residents living on the northern and eastern sides of the multi-storey town centre building. As private	Low	Moderate	The Proposal would be obvious, and residents of the multi-storey building would have current views to the west across the	**Moderate-low**

Viewpoint	Description	Visual sensitivity	Magnitude of change	Visual impact	Overall impact
(existing residential)	property was not accessed for this assessment, an existing view toward the Proposal site has been taken from the ground level of the town centre and is approximately 120 metres from the Proposal site.			Regional Park interrupted. However, as potentially taller development is introduced to the north of the car park, the temporary visual emphasis on the car park would reduce. Taller development would appear in the background, when viewed from the upper levels of the town centre building, changing the focus of the view and reducing visual emphasis on the foreground car park.	
VP4 - from Soldiers Parade travelling north	A 'linear' public viewpoint representative of views of road users accessing Soldiers Parade travelling north. It is also representative of views from existing residential buildings located to the southwest.	Low	Low	The Proposal would be noticeable initially, as a large new structure to the expanding town centre. However, it would not reduce the quality of the existing view, which is not scenic or a focal point. The Proposal would temporarily be the main feature or focal point, until planned development to the east of Soldiers Parade would limit or totally screen views to the Proposal	**Low**
VP5, VP6 and VP7	These represent the views of future residents of the planned multi-storey residential buildings located in the mixed-use zone to the north, north-west and south of the Proposal site.	Moderate	Low	The Proposal would be plainly visible to adjacent residences but would not adversely affect the view. Close residents (VP6) would have wide views of the full façade, while others partial and views in the context of the adjoining railway and station. The Proposal will have finishes consistent with the intention of the precinct and be consistent in bulk and scale to planned development.	**Moderate-low**

Two photomontages have been prepared to illustrate the Proposal following construction. Figure 19 is viewpoint VP1 from the northern entry of Edmondson Park Station looking east. Figure 20 is viewpoint VP4 from the intersection of Soldiers Parade and General Boulevard looking north-east.

Figure 19 Photomontage of Proposal looking east from the northern entry of Edmondson Park Station (indicative only and subject to detailed design).

Figure 20 Photomontage of Proposal looking north-east from the intersection of Soldiers Parade and General Boulevard looking north-east (indicative only and subject to detailed design).

All lighting to be designed and installed on the Proposal would be in accordance with the requirements of the Australian Standard AS4282 *Control of the Obtrusive Effects of Outdoor Lighting*.

The Proposal is generally consistent with the DCP guidelines in relation to landscape character and visual impact. During detailed design multiple façade designs would be considered and analysed to ensure an attractive and appropriate finish.

Overshadowing

The impacts of overshadowing have not been modelled for the Proposal structure.

The Proposal structure is a maximum height of approximately 22 metres and is consistent with the maximum 24 metre height for the zone. The Proposal building footprint is setback approximately 6 metres from the northern boundary, approximately 5 metres from the Proposal access road to the east and 30 metres from the eastern boundary with the Regional Park, and approximately 30 metres from the western boundary with Soldiers Parade.

The Proposal is located immediately to the north of the Proposal access road, and the SWRL, providing a separation distance in excess of 70 metres from the nearest future residential dwellings to the south. The Proposal is bordered by Soldiers Parade to the west and the Regional Park to the east. Given this location with respect to existing and future residential dwellings, it is not considered that the Proposal will give rise to any significant adverse overshadowing impacts.

6.2.3 Mitigation measures

An Urban Design Plan and Landscaping Plan is to be submitted to Transport for NSW and endorsed by the Place and Urban Design team. The Urban Design Plan is to address the fundamental design principles as outlined in 'Around the Tracks' – urban design for heavy and light rail, TfNSW, Interim 2016. The Urban Design Plan and Landscaping Plan shall:

- demonstrate a robust understanding of the site through a comprehensive site analysis to inform the design direction, demonstrate connectivity with street networks, transport modes, active transport options, and pedestrian distances
- identify opportunities and challenges
- establish site specific principles to guide and test design options
- demonstrate how the preferred design option responds to the design principles established in 'Around the Tracks', including consideration of Crime Prevention through Environmental Design Principles.

The Urban Design Plan and Landscaping Plan is to include the Public Domain Plan for the chosen option and will provide analysis of the:

- landscape design approach including design of pedestrian and bicycle pathways, street furniture, interchange facilities, new planting and opportunities for public art
- materials Schedule including materials and finishes for proposed built works, colour schemes, paving and lighting types for public domain, fencing and landscaping
- an Artist's Impression or Photomontage to communicate the proposed changes to the precinct.

The following design guidelines are available to assist and inform the Urban Design Plan and Landscaping Plan for the Proposal:

- TAP Urban Design Plan, Guidelines, TfNSW, Draft 2018
- Commuter Car Parks, Urban Design Guidelines, TfNSW, Interim 2017
- Managing Heritage Issues in Rail Projects Guidelines, TfNSW, Interim 2016
- Creativity Guidelines for Transport Systems, TfNSW, Interim 2016
- Water Sensitive Urban Design Guidelines for TfNSW Projects, 2016

The Urban Design Plan and Landscaping Plan shall be:

- prepared prior to finalisation of the detailed design

- prepared in consultation with Liverpool City Council and relevant stakeholders
- prepared by a registered Architect and/or Landscape Architect.

The detailed design of the Proposal is to be undertaken with reference to the recommendations included in the LVIA (Envisage, 2022), and include:

- ensure the car park has a modulated, well designed facade and an appropriate high quality finish
- retain existing trees along the north-western boundary of the Proposal site to soften the facade, screen the lower floor levels of the Proposal, and break up the extent of hard surfacing/built structures when viewed from the station and town centre
- supplement existing tree planting along the western boundary to compensate for trees which are removed or damaged during construction to maintain a dense, vegetated screen of lower floor levels
- include feature tree planting around the Proposal, particularly along the southern boundary, to soften the building when viewed from the town centre and provide amenity and shade for pedestrians moving between the car park and the Station
- use a common theme/style for new elements like seating, paving, signage, and lights, to enhance the character of the area and provide consistency with the station precinct
- install a well-designed pedestrian walkway between the station and the Proposal, including a wide footpath, lighting, CCTV and way finding signage
- use high quality materials and an integrated colour palette consistent with the station precinct
- select materials and colours to minimise the visual prominence of the Proposal, however, colour could be incorporated as a design feature (if consistent with the UDLP)
- recessive colours for fencing (with low reflectivity and high grey content) to be less visible
- avoid highly reflective materials in the construction of the Proposal to reduce potential glare impacts

During construction:

- installing well designed screen hoarding and/or shade cloth screens around the construction area where visible from the town centre and Soldiers Parade
- ensure site compounds and stockpiles are located away from visually prominent locations, such as where visible from town centre and Soldiers Parade.

Refer to Chapter 7 for a full list of proposed mitigation measures.

6.3 Noise and vibration

A Noise and Vibration Impact Assessment (NVIA) was undertaken by Pulse White Noise Acoustic (PWNA) Consulting for the Proposal (PWNA, 2022). The findings of this assessment are summarised in this section.

6.3.1 Existing environment

Sensitive receivers and noise catchment areas

As discussed in Section 1.3, the suburb of Edmondson Park is rapidly being developed. The Proposal site is adjacent to an active railway corridor. There are currently a number of apartment blocks and non-residential receivers already located south of Edmondson Park Station, and a number of greenfield sites to the north of Edmondson Park Station and the Proposal site, which are planned to be developed as part of the Edmondson Park Town Centre. To the south and north of the town centre is predominantly low density residential development. Immediately to the east of the Proposal site and further west of MacDonald Road is Regional Park land.

Currently, the closest residential receiver to the Proposal south of the railway line is an apartment block on Henderson Road around 140 metres southwest of the proposed car park. The closest residential receiver to the north of the railway line is located around 310 metres northwest at residential apartments on Soldiers Parade.

The NVIA identified four Noise Catchment Areas (NCAs) for the assessment shown in Figure 21. The catchment areas are identified as follows:

- **NCA A**: includes the receivers located on the northern side of the railway line and the eastern side of Soldiers Parade. The closest receivers in this catchment are homes on rural-residential properties, while newly constructed low density properties are located further away. The dominant noise sources in this catchment are vehicle traffic from Campbelltown Road, road traffic noise from local streets, noise from the railway line and residential noise.
- **NCA B**: contains the receivers on the northern side of the railway line and to the west of Soldiers Parade. The catchment consists of newly constructed low density residential dwellings and also the St Francis Catholic College. The dominant noise sources in this catchment are vehicle traffic from Bernera Road/Soldiers Parade, road traffic noise from local streets, noise from the school, noise from the railway line and residential noise.
- **NCA C**: includes the receivers located to the south of the railway line and west of Soldiers Parade. The catchment primarily consists of apartments and townhouses, but also contains commercial receivers. The dominant noise sources in the catchment are vehicle traffic from Campbelltown Road and Soldiers Parade as well as noise sources associated with the railway line and commercial users.
- **NCA D**: contains the receivers to the south of the railway line and to the east of Soldiers Parade, consisting of low density receivers. In this catchment, the major noise sources are vehicle traffic from Campbelltown Road and local streets, noise from the railway line and local residential noise.

Figure 21 Noise catchment areas shaded yellow, blue, green and purple (Source PWNA, 2022)

Background noise levels

Existing noise levels (prior to construction of the Proposal) taken from selected locations were used to determine background noise levels and establish operational and construction noise criteria for sensitive receivers close to the Proposal.

Due to COVID restricting access, for this project, unattended noise monitoring results were adopted from logging conducted by Muller Acoustic Consulting in January and February 2020 as part of the Edmondson Park (South) multi-storey commuter car park project. This unattended monitoring was conducted at the two residential receiver locations in Table 15.

Table 15 Noise monitoring locations

Logger	Location	Coordinate (easting)	Coordinate (northing)
EDP1	Croatia Avenue, Edmondson Park	302357	6239519
EDP2	Lowe Avenue, Bardia	303150	6238898

The unattended noise monitoring at the location EDP1 was adopted as representative of the background noise levels for NCA A and NCA B, and the monitoring at location EDP2 adopted as representative of the background noise levels for NCA C and NCA D.

Rating Background Noise Levels (RBLs) are determined from the measurement of L_{A90} noise levels (representing the noise level exceeded for 90 per cent of the monitoring period).

The equivalent continuous sound level (L_{Aeq}) is the average of the varying noise over the sample period. The results of the unattended noise measurements for both monitoring locations, including derived RBLs are summarised in Table 16.

Table 16 Unattended noise monitoring results

Monitoring Location	Period	Measured Background Noise Level (L_{A90}), dB	Measured L_{Aeq}(period), dB
EDP1 (NCA A and NCA B)	Day (7am to 6pm)	41	57
	Evening (6pm to 10pm)	45	56
	Night (10pm to 7am)	36	48
EDP2 (NCA C and NCA D)	Day (7am to 6pm)	39	52
	Evening (6pm to 10pm)	43	58
	Night (10pm to 7am)	37	52

6.3.2 Potential impacts

Construction phase

Construction noise

The assessment includes identification of potentially affected receivers, description of activities and construction scenarios involved in the Proposal, derivation of the construction noise criteria for standard construction working hours and Out of Hours (OOH) 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, 2009). The ICNG is specifically aimed at managing noise from construction works regulated by DPIE and is used to assist in setting statutory conditions in licences or other regulatory instruments.

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 in Table 17.

Table 17 ICNG recommended NMLs

Provision description	NML ($LA_{eq\ 15\ minutes}$)	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 + 10dBA	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 meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
Monday to Friday 7.00am to 6.00pm Saturday 8.00am to 1.00pm No work on Sunday or Public Holidays	Highly noise affected 75dBA	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 relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: • times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences • if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard 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.

Using the ICNG criteria, NMLs for construction activities have been developed for receivers during standard construction hours and out of hours periods (as discussed in Section 3.3.3) and are summarised in Table 18.

Table 18 NMLs as basis for the acoustic assessment

Receiver Types	Day (Standard)	Day (OOH)	Evening	Night
Residential – NCA A	51	46	46	41
Residential – NCA B	51	46	46	41
Residential – NCA C	49	44	44	42
Residential – NCA D	49	44	44	42
Commercial	70	70	N/A	N/A
School Classroom	55	55	N/A	N/A
Active Recreation	65	65	N/A	N/A

Potential construction noise impacts were modelled for selected construction scenarios, using SoundPLAN 8.0 noise modelling software. The six modelling scenarios are:

- Scenario 1: Site preparation
- Scenario 2: Utilities infrastructure
- Scenario 3: Foundations (earthworks)
- Scenario 4: Foundations (piling)
- Scenario 5: Superstructure
- Scenario 6: Architectural features/ finishes

Predicted construction noise results for the worst-case receiver in each catchment are presented in Table 19 for activities during standard hours. The quantities of receivers that are predicted to have exceedances of the standard hours criteria per catchment are shown in Table 20.

It is shown that during standard construction hours, no exceedances of the NMLs are predicted at any receiver in NCA A, B or D. Exceedances of the standard construction hours NMLs are predicted in NCA C at four receivers for each scenario. A maximum exceedance of the standard hours NML of 10 dB is predicted during scenario 3, earthworks foundations.

Table 19 Worst-case construction scenario results, standard hours, dBA. Scenarios predicted to exceed the Standard Day NML are designated with an asterisk.

Catchment	Receiver	Standard Day Criteria	Scenario					
			1	2	3	4	5	6
NCA A	Residential	51	44	43	48	46	45	44
	School Classroom	55	41	40	44	43	42	40
NCA B	Residential	51	46	45	49	48	46	45
	School Classroom	55	36	34	39	36	36	35

Catchment	Receiver	Standard Day Criteria	Scenario					
			1	2	3	4	5	6
	Active Recreation	65	36	35	40	38	37	35
NCA C	Residential	49	**55***	**53***	**59***	**57***	**53***	**52***
	Commercial	70	50	49	53	52	50	49
NCA D	Residential	49	43	42	46	45	44	43

Table 20 Number of receivers with predicted exceedances per scenario, standard hours.

Catchment	Receiver	Scenario					
		1	2	3	4	5	6
NCA A	Residential	0	0	0	0	0	0
	School Classroom	0	0	0	0	0	0
NCA B	Residential	0	0	0	0	0	0
	School Classroom	0	0	0	0	0	0
	Active Recreation	0	0	0	0	0	0
NCA C	Residential	4	4	4	4	4	4
	Commercial	0	0	0	0	0	0
NCA D	Residential	0	0	0	0	0	0

Predicted construction noise results for the worst-case receiver in each catchment are presented in Table 21 for the out-of-hours works (OOHW) night period. The quantities of receivers that are predicted to have exceedances of the OOHW night criteria per catchment are shown in Table 22.

Exceedances of the OOHW NMLs are predicted in all four catchments during all six scenarios, except for NCA D during scenario 2, utilities infrastructure. A maximum exceedance of the OOHW NMLs of 17 dB is predicted in NCA C during scenario 3, earthworks foundations.

Table 21 Worst-case construction scenario results, OOHW night, dBA. Scenarios predicted to exceed the OOHW Night NML are designated with an asterisk.

Catchment	Receiver	OOHW Night Criteria	Scenario					
			1	2	3	4	5	6
NCA A	Residential	41	**44***	**43***	**48***	**46***	**45***	**44***
NCA B	Residential	41	**46***	**45***	**49***	**48***	**46***	**45***
NCA C	Residential	42	**55***	**53***	**59***	**57***	**53***	**52***
NCA D	Residential	42	**43***	42	**46***	**45***	**44***	**43***

Table 22 Number of receivers with predicted exceedances per scenario, standard hours.

Catchment	Receiver	Scenario					
		1	2	3	4	5	6
NCA A	Residential	11	3	30	29	22	8
NCA B	Residential	2	2	40	14	2	2
NCA C	Residential	10	8	23	21	8	8
NCA D	Residential	2	0	5	5	5	2

Construction road traffic

The number of construction vehicles travelling on public roads as a result of the proposed activity is expected to be relatively small compared to current traffic flows. Therefore road traffic noise from construction vehicles on public roads is expected to have a negligible impact on neighbouring receivers. Any increase in road traffic noise levels is predicted to be well below 2 dB. Therefore construction road traffic noise impacts are not further considered.

Vibration

The *Construction Noise and Vibration Strategy* (Transport for NSW, 2019) sets out safe working distances to prevent cosmetic damage and to achieve the human response criteria for vibration. The minimum distance between a piling rig and any neighbouring on-site buildings to prevent cosmetic damage is recommended to be 2 metres for a bored piling rig and 15 metres for a hammer piling rig. For a large vibratory roller a safe working distance of 100 metres to achieve the residential human response criteria for continuous vibration is recommended. The nearest existing receivers to the construction area are approximately 140 metres from the Proposal.

Given the equipment proposed and the distances to nearby receivers, cosmetic damage or human response to construction vibration is not predicted for this project as no receivers are located within recommended minimum working distances.

Operation phase

A review of the operational noise emissions associated with the Proposal has been completed to quantify the potential impact on surrounding noise sensitive receivers. The operational assessment included both sources within the car park (vehicle movements, engine start, lift motor and lift air conditioning) as well as road traffic noise of vehicles travelling to and from the Proposal site.

Car park noise

Operational noise sources associated with the Proposal are expected to be minor in nature. The assessment concluded that noise levels from the lift motor and lift air conditioning will be inaudible at all nearby receivers.

The potential noise impacts associated with operation of the Proposal considered general operational vehicle noise (car movement and engine noise). Inputs into the noise model included terrain, ground absorption, buildings, fences, receiver locations and noise sources. A modelled sound power level for general car usage of 85 dBA L_{Aeq} was adopted and a maximum 93 dBA sound power level for a car engine start.

Predicted noise levels from the general operation of the car park are a maximum of 36dB $L_{Aeq(15min)}$ at residential receivers in NCA C, satisfying the maximum applicable night time *Noise Policy for Industry* (EPA, 2017) criteria of 38dB $L_{Aeq(15min)}$. Predicted operational noise results are predicted to comply with the criteria at all receivers during all time periods.

Road Traffic

NSW *Road Noise Policy* (RNP) defines the road noise assessment criteria for developments. The assessment criteria are shown in Table 23.

Table 23 Road Traffic Noise Assessment Criteria for Residential and Non-Residential Land Uses

Road category	Type of project/development	Assessment Criteria – dBA Day (7am to 10pm)	Assessment Criteria – dBA Night (10pm to 7am)
Local roads	Existing residences affected by additional traffic on local roads generated by land use developments	55dB $L_{Aeq(1hr)}$	50dB $L_{Aeq(1hr)}$
School Classrooms	Proposed road projects and traffic generating developments	40dB $L_{Aeq(1hr)}$ (internal)	N/A
Open Space (active use)	Proposed road projects and traffic generating developments	60dB $L_{Aeq(1hr)}$	N/A

The projected traffic data for the opening year and the design year for the build and no build scenarios have been obtained from data supplied by the SCT Consulting Traffic and Transport Impact Assessment (SCT Consulting, 2022), assuming even split between northbound and southbound traffic, a factor 1.3 increase to traffic volumes between 2026 and 2036, the Proposal being the only difference on traffic numbers between the build and no build scenarios, and that heavy vehicles represent 5% of traffic on Soldiers Parade.

Noise levels between the build and no build scenarios differ by less than 1.2 dB at all receivers, which is below the 2dB stated by the RNP and generally accepted as the threshold of perceptibility to a change in noise level.

6.3.3 Mitigation measures

Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared by the Construction Contractor and implemented in accordance with the requirements of the ICNG (Department of Environment and Climate Change, 2009) and *Construction Noise and Vibration Strategy* (Transport for NSW, 2019) and the Noise and Vibration Impact Assessment for the Proposal (PWNA, 2022). The CNVMP would take into consideration Standard management measures (e.g. periodic receiver notification and employee training and induction), source mitigation measures (e.g. use of quieter and less vibration emitting construction methods, non-tonal reverse beepers) and path mitigation measures (e.g. use of structures to shield residential receivers) to reduce construction noise and vibration where feasible and reasonable.

For any highly affected noise receivers, Transport for NSW would communicate with the impacted residents regarding the duration and noise level of the works, and by describing any respite periods that would be provided.

Refer to Chapter 7 for a full list of proposed mitigation measures.

6.4 Aboriginal heritage

EMM Consulting completed an Aboriginal heritage due diligence assessment (AHDDA) in January 2020 (EMM, 2020) to identify potential heritage constraints on the Proposal site.

6.4.1 Existing environment

A search of Aboriginal heritage information management system (AHIMS) was undertaken on 19 November 2019 and a site inspection by a qualified archaeologist was conducted on 26 November 2019.

The Proposal site is located within a landscape feature likely to indicate the presence of Aboriginal objects in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (Department of Environment, Climate Change and Water, 2010) as the Proposal site is located within 200 metres of a second order stream.

The AHIMS search of a five kilometre buffer identified a number of sites across the search area in proximity to the Proposal site. The search identified one Aboriginal artefact site (#45-5-3990) within the Proposal site, but no Aboriginal places have been declared. However, the Proposal site is located in an area that has been highly modified through the previous construction of the adjacent SWRL and the subsequent substation. This disturbance has resulted in site #45-5-3990 being recorded as destroyed.

Based on the findings of the EMM report, the Proposal site is considered to have low archaeological potential and it is considered unlikely that any Aboriginal heritage items would be located in the vicinity of the Proposal due to the history of disturbance.

6.4.2 Potential impacts

Construction phase

The ADDHA identified low risk of Aboriginal objects being present within the Proposal site due to the history of disturbance and no known objects being located within the Proposal site. Therefore, it is considered unlikely that any Aboriginal heritage items would be harmed during construction of the Proposal.

The Proposal would proceed with caution and in the event any unexpected aboriginal items are uncovered works would cease.

Operation phase

The Proposal is unlikely to harm Aboriginal heritage during operation.

6.4.3 Mitigation measures

All construction staff would undergo an induction in the recognition of Aboriginal cultural heritage. If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2021) 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 Senior Environment and Sustainability Officer so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the EES Group and the Tharawal 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 would be obtained prior to works recommencing at the location.

Refer to Chapter 7 for a full list of proposed mitigation measures.

6.5 Non-Aboriginal heritage

6.5.1 Existing environment

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

- National Heritage List
- NSW State Heritage Register
- State Significant Precinct SEPP
- Liverpool Local Environmental Plan 2008.

The assessment did not identify any heritage items within the site boundaries. The nearest listed heritage item is the 'Ingleburn Village site – three Riley Newsum Prefabricated cottages' which is located approximately 400 metres south west of the Proposal site. These buildings were approved to be demolished by Liverpool City Council under DA595/2014 as part of the development of the Edmondson Park Town Centre. The buildings were demolished in accordance with their development consent and there are no listed heritage items within or in the immediate proximity of the Proposal site.

6.5.2 Potential impacts

Construction phase

As there are no non-Aboriginal 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 of heritage value.

Operation Phase

No impacts to non-Aboriginal heritage items 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, 2021) would be followed.

Refer to Chapter 7 for a full list of proposed mitigation measures.

6.6 Socio-economic impacts

6.6.1 Existing environment

The Proposal is located within the Edmondson Park South precinct, which is a major land release area 40 kilometres south west of the Sydney CBD. The area is undergoing significant change from a semi-rural area to a residential area with a town centre focussed on Edmondson Park Station. The area to the south of the Edmondson Park station has been established as the mixed use town centre and construction is continuing. The planned growth for Edmondson Park is described in Section 1.3.2.

There are a significant number a residential developments which have been completed in the last few years within, and in the areas surrounding, Edmondson Park town centre. The nearest residential properties to the Proposal site are apartments located approximately 150 metres to the south-west, and approximately 350 metres to the north-west. Terrace dwelling combinations are planned approximately 100 metres from the Proposal on the land to the south on the opposite side of the SWRL corridor.

The population estimate of Edmondson Park in June 2020 was 5,409 people, which was approximately 16 per cent growth from the previous year and almost twice the population of 2016 (idcommunity, 2020).

As of the 2016 Census a high majority of residents lived in separate houses and only a very small number of residents lived in apartments. There is an above average use of public transport in Edmondson Park when commuting to and from work. Approximately 20 per cent of the population use public transport to get to work with a large majority using the train (Australian Bureau of Statistics, 2016a).

The SWRL, which provides a railway line to service the south western suburbs of Sydney was opened in 2015. This included Edmondson Park Station which is the station before the train line terminates at Leppington Station further west.

6.6.2 Potential impacts

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
- changes to access arrangements including pedestrian diversions.

Construction activities would be predominantly confined within the Proposal site, although some footpath and road works are anticipated to occur outside these boundaries.

Construction workers would park in the wider precinct to avoid impacting on commuter parking spaces.

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

It is not anticipated that any temporary land acquisitions would be required for the construction stage of the Proposal.

Operation phase

The proposed new multi-storey commuter car park would result in the gaining of approximately 700 additional commuter parking spaces to support growing parking demand. The longer term social and economic impacts of the Proposal would be positive for both residents and businesses of Edmondson Park, and particularly for commuters who frequent the station.

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 CBD may be reduced through uptake of public transport.

There would be an improvement in the connectivity of Edmondson Park Station for commuters as well as an improvement in safety by reducing illegal parking and parking in local streets. The new parking facilities would help to encourage more people to use public transport. As a result, it is expected that the Proposal would have a positive impact on existing and planned nearby businesses.

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 Community Liaison Management Plan (CLMP) 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.

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

Refer to Chapter 7 for a full list of proposed mitigation measures.

6.7 Biodiversity

6.7.1 Existing environment

Arboricultural Consultancy Australia undertook an assessment of the Proposal site and neighbouring vegetation in accordance with the Transport for NSW *Vegetation Offset Guide*

(2019) based on a desktop review of existing information and a site visit conducted on 18 March 2022.

As discussed in Section 1.3.1, the Proposal site is an undeveloped site that was completely cleared of vegetation in 2012 during the development of the SWRL and Edmondson Park Station and is now vegetated in grasses, with patches of tree plantings located along the site boundaries.

A photo of vegetation present on the Proposal site is shown in Figure 22.

Figure 22 Photograph of vegetation present on the Proposal site and adjoining sites, looking east from the Proposal access road near the intersection with Soldiers Parade. The vegetation in the left of the image aligned to the northern boundary of the site. The vegetation in the background located within the Regional Park lands. (Source: Envisage Consulting, 2020)

A total of twenty-six (26) trees were identified within the study area, including sixteen (16) trees along the northern boundary, nine (9) trees along the eastern boundary and one (1) tree along the southwest boundary of the Proposal site (refer to Figure 24 below). A densely vegetated area set aside as a Regional Park in the Edmondson Park South Concept Plan is located directly east of the Proposal site.

Four (4) species of flora were identified in the assessment, which included five (5) natives, eighteen (18) koala habitat specimens and three (3) dead specimens. The tree plantings within the site are identified as transient plantings and largely considered to be of low retention value.

The study area is partially mapped as ‘Cumberland Plains Shale Woodlands’ and includes species characteristic of this woodland area, including *Eucalyptus mouccana* (Grey Box).

Habitat Assessment

No trees containing habitat features, including nesting hollows, were observed during the site visit.

Threatened Ecological Communities

The study area is partially mapped as ‘Cumberland Plains Shale Woodlands,’ which is listed as a Critically Endangered Ecological Community under the *Biodiversity Conservation Act 2016*. All replacement plantings will comprise species characteristic of the Cumberland Plains Shale Woodlands Area.

Biodiversity Certification

The Proposal site is located on land that was biodiversity certified under Part 7 of Schedule 7 of the (then) *Threatened Species Conservation Act 1995* (TSC Act). Biodiversity certified land is identified on the map titled South West Growth Centre - Biodiversity Certification Amendment No. 2 dated 12 June 2015. Figure 23 shows the Proposal in respect to land mapped as biodiversity certified.

The TSC Act was repealed in 2017 and replaced by the *Biodiversity Conservation Act 2016* (BC Act). However, the *Biodiversity Conservation (Savings and Transitional) Regulation 2017* provided that Part 7 of Schedule 7 of the TSC Act would continue to operate despite its repeal.

Clause 8.4 of the BC Act states that any activities under Part 5 of the EP&A Act carried out on biodiversity certified land are not likely to significantly affect threatened species or ecological communities and the Determining Authority does not need to consider biodiversity impacts on that land.

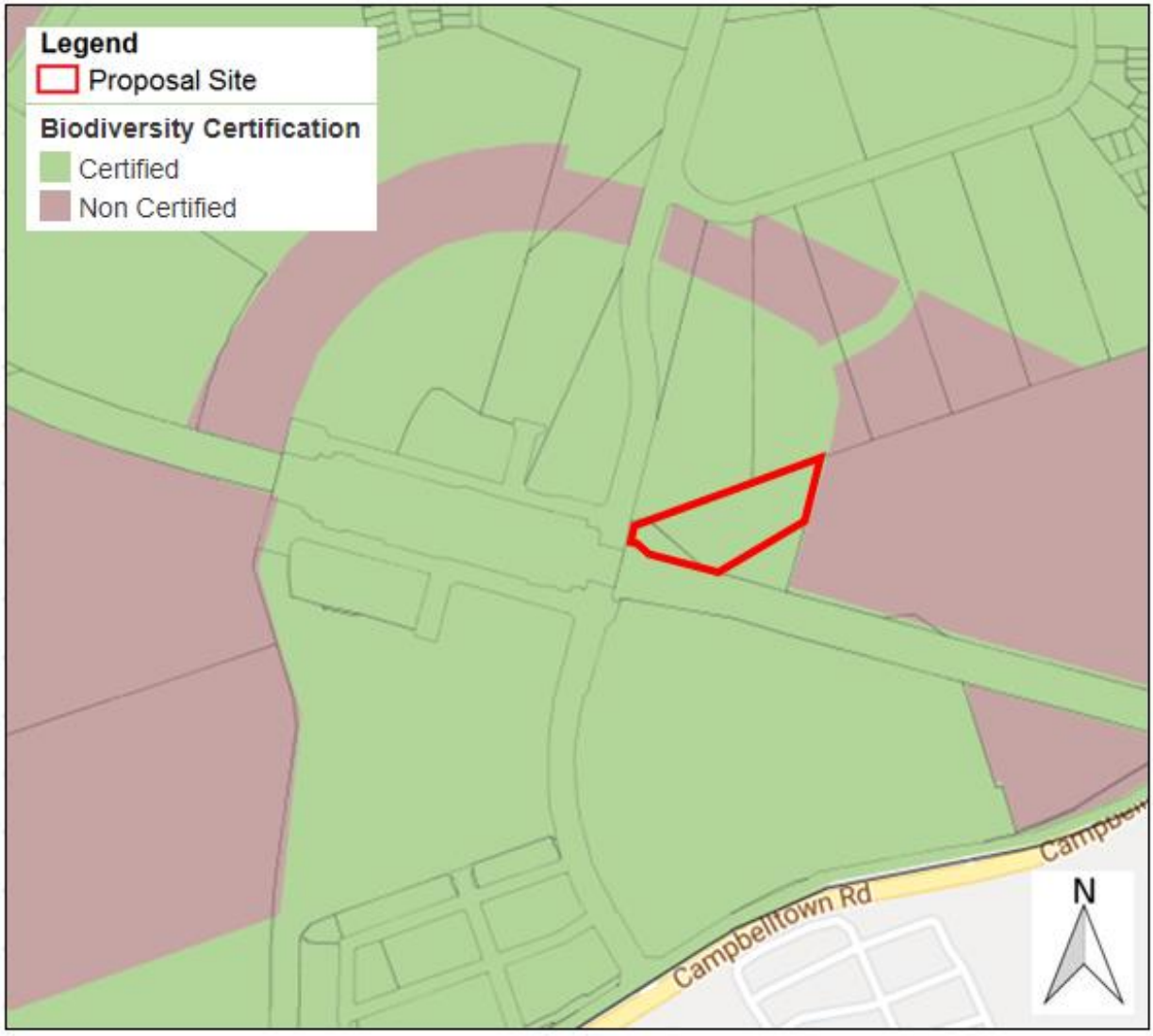

Figure 23 Biodiversity certified land (Source: ePlanning Liverpool City Council, 2022)

As part of the biodiversity certification of the Sydney Growth Centres and strategic assessment approval under the EPBC Act, measures to offset the impacts of development were established. The Growth Centres Biodiversity Offset Program was established to manage the offsets and protect high conservation value bushland in Western Sydney. The NSW Government set aside $530 million to purchase areas of high conservation value or to enter into private conservation agreements, both inside and outside the Growth Areas. The Program receives funding annually from the NSW Government at the same rate at which development is expected to occur in the Growth Centres.

Threatened Fauna

No threatened fauna were observed within the study area during the site visit. However, threatened fauna may occasionally use the area as a roosting / foraging area.

6.7.2 Potential impacts

Construction phase

Transport for NSW has prepared a *Vegetation Offset Guide* (TfNSW, 2019) to assist in meeting biodiversity sustainability targets and provide a consistent approach for offsetting impacts to vegetation on Transport for NSW projects.

As described in the Arborist Impact Assessment Report (Aboricultural Consultancy Australia, 2022), the proposal would clear 13 juvenile / semi-mature trees, including four (4) Sheoak (*Casuarina),* eight (8) Grey Box (*eucalyptus moluccana)* and one (1) Acacia (*Acacia spp.).* One unidentified dead tree would also be removed as a result of the proposal.

A list of the 14 trees proposed to be removed, their species and whether they are representative of the 'Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest' ecological community, which is listed as critically endangered under the *Environment Protection and Biodiversity Conservation Act 1999* and the 'Cumberland Plain Shale Woodland' listed as critically endangered under the *Biodiversity Conservation Act 2016* are shown in Table 24. None of the trees proposed to be removed are specifically listed as endangered or threatened species.

Table 24 – Species proposed to be removed as per the Arborist Impact Assessment Report

Tree No.	Species	Representative of Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest – critically endangered ecological community	Tree diameter - DBH (m)
1	Casuarina	No	0.150
2	Casuarina	No	0.110
3	Casuarina	No	0.150
4	Acacia spp.	No	0.110
5	Eucalyptus moluccana	Yes	0.075
6	Casuarina	No	0.135
7	Eucalyptus moluccana	Yes	0.175
8	Eucalyptus moluccana	Yes	0.170
9	Eucalyptus moluccana	Yes	0.110
10	Eucalyptus moluccana	Yes	0.160
18	Eucalyptus moluccana	Yes	0.190
19	Dead	N/A	N/A
20	Eucalyptus moluccana	Yes	0.160
21	Eucalyptus moluccana	Yes	0.110

The juvenile / semi-mature trees identified for removal are considered 'Native Vegetation' under the *Vegetation Offset Guide,* as they are native to NSW. These species may provide foraging habitat for some woodland birds and koalas. However, due to the young age of the trees and the presence of better alternative habitat nearby, these trees are not considered threatened species habitat. With the exception of one tree assessed as of moderate retention value, all of the trees for removal have been assessed as of very low retention value.

In addition to the removal of the trees detailed above, the proposal would also require the removal of grassland currently vegetating the site.

As the land was completely cleared in 2012, is biodiversity certified and contains no significant vegetation, the clearing of vegetation is considered unlikely to significantly affect threatened species or ecological communities. Therefore, offsets are not required under the BC Act.

The TfNSW *Vegetation Offset Guide (*2019) provides offset requirements where the vegetation proposed to be cleared has an impact on non-threatened vegetation. As the vegetation proposed to be cleared is part of landscaping, is considered 'Native Vegetation' and will pose an impact to non-threatened vegetation, offsets will be required under the guide.

Although the *Vegetation Offset Guide* (2019) indicates that for native species secondary offsets would be required, given that there are a total of 14 trees that would be cleared by the proposed works, the single tree calculator from the *Vegetation Offset Guide* (2019) was used. Consequently, it is anticipated that a total of 40 trees will be required for offset, however, the total number will be calculated as part of detailed design.

No Priority Weeds (listed under the *Biosecurity Act 2015*) were observed during the site visit. However, these species may be present as dormant propagules, and the importation of plant and materials used on other sites could introduce or spread propagules throughout the site.

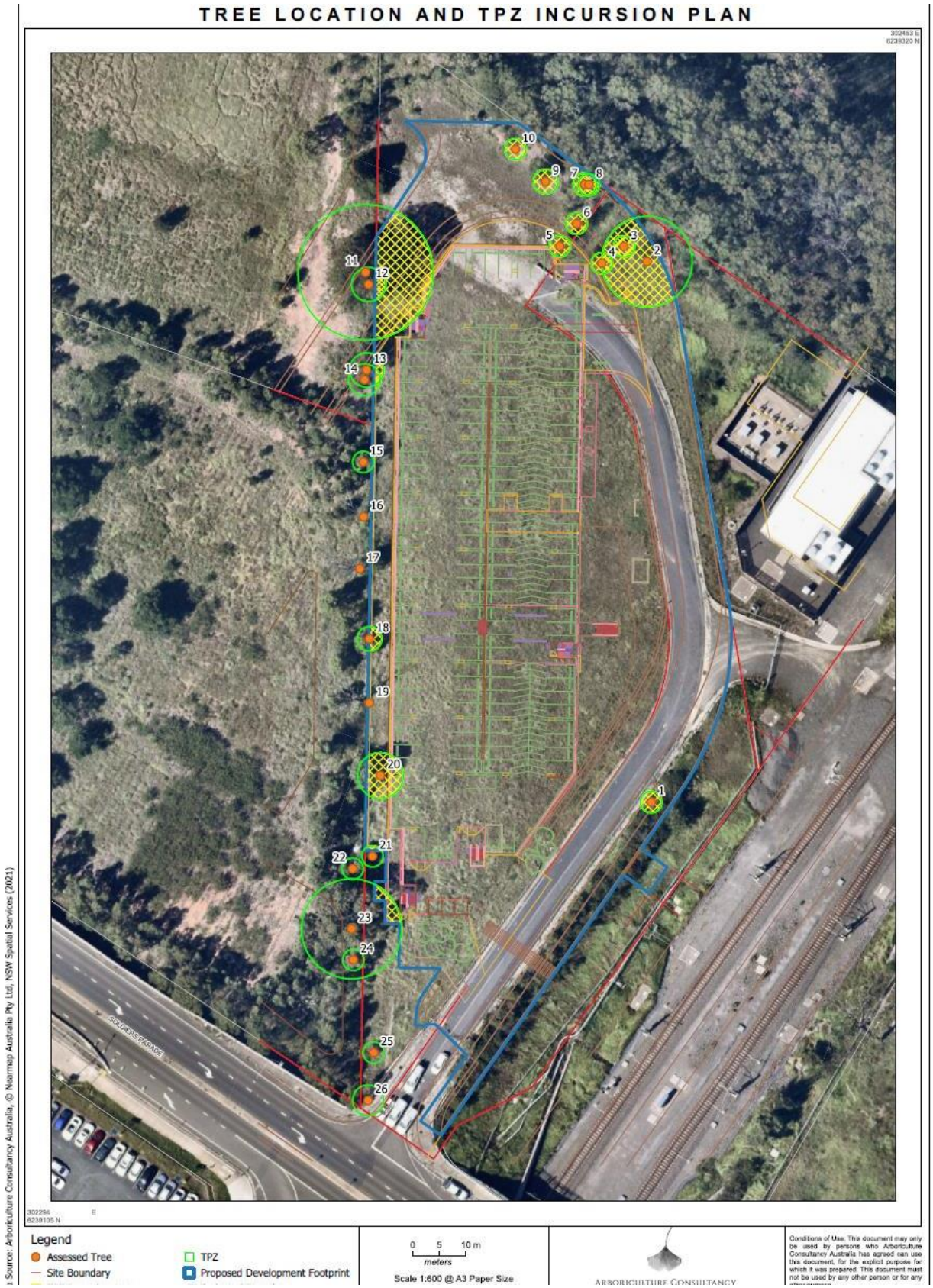

Figure 24 Tree Location and TPZ Incursion Plan (Source Arboriculture Consultancy Australia, 2022)

Operation phase

No threatened species, nor habitat suitable for threatened fauna are likely to be located within the Proposal site. Operational activities are not proposed to significantly change the land use, and as a result there would be no increased risk to biodiversity.

6.7.3 Mitigation measures

- Construction of the Proposal would be undertaken in accordance with TfNSW's *Vegetation Management (Protection and Removal) Guideline* (TfNSW, 2018c) and TfNSW's Fauna Management Guideline (TfNSW, 2019).
- 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 or areas of sensitivity.
- Works will occur in accordance with the recommendations / mitigation measures described in the Arborist Impact Assessment Report (Aboricultural Consultancy Australia, 2022)
- Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees / vegetation nominated to be removed for the proposal 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.
- Tree Protection Zones (TPZs) would be established around trees to be retained, as nominated in the Arboricultural Impact Assessment. Tree protection would be undertaken in line with AS 4970-2009 Protection of Trees on Development Sites and would include exclusion fencing of TPZs.
- Offset for tree removal and landscaping would be undertaken in accordance with *Transport for NSW's Vegetation Offset Guide (Transport for NSW, 2019)* and in consultation with Council, and/or the owner of the land upon which the vegetation is to be planted.
- In the event of any tree to be retained becoming damaged during construction, the Construction Contractor would immediately notify the TfNSW Project Manager and TfNSW Senior Environment and Sustainability Officer to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
- Should the detailed design or onsite works determine the need to remove or trim any additional trees which have not been identified in the REF, the Construction Contractor would be required to complete TfNSW's Removal or Trimming Vegetation Application and submit it to TfNSW for approval.
- Weed control measures, consistent with TfNSW's Weed Management and Disposal Guideline (TfNSW, 2015), 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. Additionally, plant and equipment would be cleaned prior to accessing the proposal site.

Refer to Chapter 7 for a full list of proposed mitigation measures.

6.8 Contamination, geology and soils

A preliminary geotechnical report was prepared by FutureRail in December 2019 to provide a preliminary targeted assessment of the geological properties of the site. A Preliminary Site Investigation (PSI) was also completed by FutureRail in February 2020.

6.8.1 Existing environment

Soils

Edmondson Park is underlain by the Blacktown soil unit. Soils of the Blacktown Group are typically found in landscapes characterised by gently undulating slopes and rises within the broader Wianamatta Group shales, with local relief of up to 30 metres and slopes of less than five per cent. These soils are moderately reactive, highly plastic and display poor drainage.

The Proposal site is underlain by the Bringelly Shale, which is described as shale, claystone and interlaminated / interbedded sandstone and siltstone, fine to medium grained lithic sandstone, siltstone, rare coal and tuff.

Weathering of the underlying Bringelly Shale typically forms a silty/gravelly clay residual soil, of medium to high plasticity. Previous investigations note that soil stiffnesses are typically very stiff to hard, but subject to local variation. The occurrence of ironstone gravels and bands has also been noted as a typical characteristic of the Bringelly Shale.

The Proposal site is not mapped as likely to have Acid Sulfate Soils (ASS).

Contamination

A review of the NSW EPA Contaminated Land Public Record and the *Protection of the Environment Operations Act 1997* (PoEO Act) Public Register were undertaken on 26 August 2021. The review identified that the Proposal site is not listed as a contaminated site, nor has the site been subject to any regulation under the *Contaminated Land Management Act 1997*.

The Proposal site is located on land formerly occupied by the Ingleburn Army Camp, which indicates general waste associated with military activities may be present in the area such as concertina wire, small arms ammunition and unexploded ordinances (UXO). However, following a UXO investigation undertaken by G-tek Australia Pty Limited, a Works Area Release was issued dated 11 November 2021 (G-tek Australia Pty Limited, 2021). This Works Area Release confirms the Proposal area is suitable for construction and ground level disturbance, free from the threat (sic) of UXO, to a depth of not less than 30cm, below the extant ground surface. It is noted that further assessment for depths greater would be undertaken as required.

6.8.2 Potential impacts

Construction phase

The Proposal would require excavation work for foundations and footings and pits for lift shafts. Other trenching, excavation or grading would be required for installing services, drainage works new paving, and vegetation removal.

Due to the relatively flat to gently sloping topography of the Proposal site, impacts to soils would be minimal during construction. It is not expected that potential or actual ASS would be disturbed during the ground levelling as there is no ASS mapped near the Proposal. An ASS Management Plan would therefore not be required.

Potential risks associated with the proposed work may include:

- fuel or oil spills or leaks from plant, equipment or vehicles
- erosion and sediment runoff

In the unlikely event, contamination is encountered on-site during construction, appropriate control measures would be implemented to manage the immediate risks. All other work that may impact on the contaminated area would cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in Unexpected Finds Protocol to be prepared for the Proposal and included in a CEMP by the Construction Contractor.

In the absence of appropriate management measures, there is a risk that new contaminants may be introduced to the local environment during construction work, for example through fuels and oils used in construction equipment and plant. In order to minimise potential risks designated fuelling areas would be established and contractors would be informed of correct fuelling techniques and proper handling techniques for potential contaminating materials. Fuelling areas and chemical storage areas would be equipped with spill kits.

Operation phase

The operation of the Proposal would have no material change to geology, soils, hazardous materials or contamination.

An increased number of cars would be using the site during operation and as described in Section 6.9 below, stormwater would collect contaminants such as heavy metals or fuel left by vehicles using the car park. These contaminants could potentially be conveyed to the onsite stormwater drainage infrastructure and the soil of the site through the proposed disposal of stormwater via onsite detention and absorption. A proposed measure to mitigate this impact would be to direct the stormwater captured through stormwater quality improvement systems before discharging to the on-site absorption system or any future stormwater reticulation. Water Sensitive Urban Design (WSUD) options would be considered for the Proposal.

6.8.3 Mitigation measures

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*.

An appropriate Unexpected Finds Protocol for contamination, considering asbestos containing materials and other potential contaminants, would be also included in the CEMP.

Refer to Chapter 7 for a list of proposed mitigation measures.

6.9 Hydrology and water quality

6.9.1 Existing environment

Surface Water

The Proposal is located within the Maxwells Creek Catchment.

The topography of the Proposal site is gently sloping from Soldiers Parade in the west down towards the east and north-east. The nearest mapped waterway is a tributary of Maxwells Creek located approximately 50 metres to the east of the Proposal site and to the south east of the substation, which trends north-east to link with Maxwells Creek. The northern edge of the site is bordered by vegetation that potentially indicates an ephemeral stream or dried creek bed, which also trends north-east towards Maxwells Creek.

Groundwater

A search of the National Groundwater Information System has been conducted and the mapping indicates that there is no existing or historic groundwater investigation data available in the vicinity of the Proposal site.

Flood

Flood prone land identified in the State Significant Precincts SEPP is located to the north-east of the Proposal site as shown in Figure 25. The identified flood prone land does not impact on any components of the Proposal.

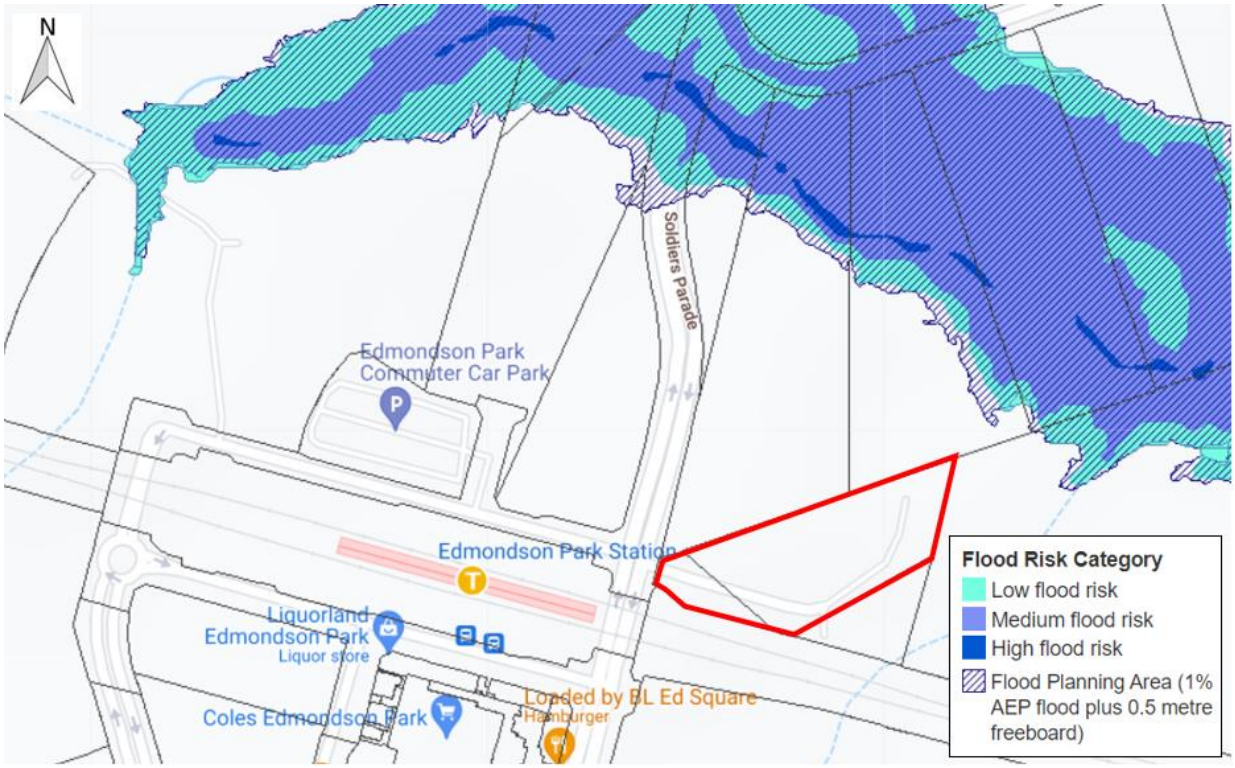

Figure 25 Flood planning areas with the Proposal site shown in red (Source: ePlanning Liverpool City Council, 2022)

6.9.2 Potential impacts

Construction phase

Without appropriate safeguards, pollutants (fuel, chemicals or wastewater from accidental spills, and sediment from excavations and stockpiles) could potentially reach nearby stormwater drains and the streams near the site.

Activities which would disturb soil during construction work (such as removal of surface vegetation and excavation) have the potential to impact upon local water quality as a result of erosion and sedimentation. There is also potential to contaminate local water quality as a result of accidental spills or inadequate fuel and chemical storage practices. Any translocating contaminants would be expected to flow towards Maxwell Creek.

Areas of excavation may need to be locally dewatered most likely as a result of rainfall events and runoff with low potential for groundwater seepage. Incorrect dewatering may pose risks to nearby waterways where run-off travels from the site to these areas. Any dewatering activities would be undertaken in line with Transport for NSW's *Water Discharge and Reuse Guideline* (TfNSW, 2019).

Given the site slopes gently (about 1:15) from west down towards to east , there is relatively low risk of significant erosion through runoff. Regardless, 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). A sediment detention basin is proposed in the north-east corner of the site (refer Figure 11), to which site runoff would be directed. This detention basin would prevent sediment laden stormwater discharging to the nature reserve east of the Proposal site. The CEMP and Erosion and Sediment Control Plan would ensure suitable erosion control measures are put in place and maintained correctly during construction.

Mitigation measures have been provided in Chapter 7 to minimise the potential for these impacts.

Operation phase

The Proposal would result in an increase in impervious area on the site. There is no existing drainage infrastructure, and adequate stormwater drainage systems will need to be included into the detailed design, compliant with Liverpool Council standards and requirements and Transport for NSW's *Water Sensitive Urban Design Guideline* (Transport for NSW, 2019).

The Proposed multi-storey car park is anticipated to receive most of the rainfall on the top level. The capture of rainfall from the top level would be via downpipes discharging stormwater to the ground level of the site.

In the absence of a reticulated stormwater network connection for the site, the Proposal will incorporate on-site detention, treatment, and on-site absorption disposal of stormwater. Once Council stormwater reticulation is introduced, connections to the stormwater and drainage infrastructure would be made in accordance with the relevant Transport for NSW and Liverpool 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.

6.9.3 Mitigation measures

A CEMP would be developed by the Contruction Contractor and approved by TfNSW which includes mitigation measures to manage erosion and sediment control. 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.

Opportunities to employ WSUD would be investigated during development of detailed design of the Proposal, along with identification of options to reduce the runoff burden to Council drainage systems.

Mitigation measures for impact during construction such as erosion and sediment control and minimising potential spills are addressed in Section 6.8 and a full list of mitigation measures is provided in Chapter 7.

6.10 Air quality

6.10.1 Existing environment

Based on a review of the existing land uses surrounding the Proposal, the existing air quality is considered to be characteristic of a developing urban environment, with notable construction and transport emission influences.

DPIE undertakes air quality monitoring across NSW. The Proposal site is located within the Sydney south-west monitoring region with air quality monitored at fixed sites. A search of the daily regional air quality index for the Sydney south-west region showed that the region

generally experienced ‘Good’ air quality values with some outlying values of ‘Poor’ and ‘Hazardous’. Notably poor and hazardous air quality being recorded in November 2019, December 2019 and parts of January 2020 correlating with widespread bushfires in NSW (DPIE, 2020).

A search of the National Pollutant Inventory database 2019/2020 data within Edmondson Park (postcode 2174) indicates that there are no nearby facilities that are monitored for air quality.

Other sources of localised air pollution within proximity of the Proposal are likely to be vehicle exhaust fumes and diesel locomotives.

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

- users of the adjacent recreational areas
- future local residents
- pedestrians and commuters within the local area

6.10.2 Potential impacts

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

Anticipated sources of dust and dust generating activities include:

- excavation for vegetation clearing, drainage works and road works
- stockpiling activities
- loading and transfer of materials from trucks
- general construction works.

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

The Proposal has the potential to impact on air quality as it would involve excavation of the construction area and other land disturbance with the potential to generate significant quantities of dust. Appropriate measures would be established to manage dust emissions from demolition works.

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

Operation phase

It is estimated that during operation the Proposal would generate 294 inbound movements during the morning peak hour and 245 outbound trips during the afternoon peak hour.

The provision of additional parking spaces would increase the number of vehicles operating within the vicinity of the Proposal, however many of these vehicles already travel to the station and park either in the existing temporary car parks or on the surrounding streets. Additionally, longer trips to the CBD may be reduced through uptake of public transport. Increased patronage of the rail system would likely result in a relative reduction of commuter vehicle

movements on roads, with a corresponding relative reduction in vehicle emissions in the long term, which would have some beneficial effects on local and regional air quality.

Overall impacts of air quality during the operation of the Proposal are considered minimal as the Proposal would not result in a significant change in land use. In the context of the local environment and existing vehicle patterns and number, this change is expected to be minimal.

Additionally the Proposal would include provision for electric vehicle parking and renewable energy options such as solar panels, which would reduce the greenhouse gases resulting from operation of the proposed car park.

6.10.3 Mitigation measures

Management and monitoring of air quality for the Proposal would be undertaken in accordance with Transport for NSW's *Air Quality Management Guideline* (Transport for NSW, 2021). 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 Chapter 7 for a list of proposed mitigation measures.

6.11 Waste and resources

6.11.1 Existing environment

No waste is generated on the site as it is currently an undeveloped vacant block.

6.11.2 Potential impacts

Construction phase

Construction of the Proposal would generate the following wastes:

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

The quantities and types of wastes expected to be generated, are not likely to pose any unusual or problematic waste management issues. Approximately 90 per cent of construction waste and demolition waste (by weight) 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 of in accordance with EPA guidelines to licenced waste facilities. Resource use on site during construction would be minimised 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.

Operation phase

The Proposal is not expected to result in changes to operational waste. Minimal waste is expected to be generated from use of the Proposal.

6.11.3 Mitigation measures

The WARR Act principles of avoiding waste generation, increasing resource recovery where possible and disposing of anything not able to be recovered appropriately would be implemented. Transport for NSW encourages the most efficient use of resources and reduces cost and environmental harm in accordance with the principles of ecologically sustainable development, as outlined in Chapter 7 this REF. Waste management targets in accordance with Transport for NSW's Environmental Management System (EMS) and the NSW *Sustainable Design Guidelines – Version 4.0* (Transport for NSW, 2019) would be developed for the Proposal and would include targets for diversion of waste from landfill and optimisation of reuse and recycling.

A Waste Management Plan (WMP) would be developed as part of the CEMP to manage waste reduction, reuse and disposal during construction. The Waste Management Plan would identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities along with other onsite management practices such as keeping areas tidy and free of rubbish. All wastes generated by the Proposal would be managed in accordance with the PoEO Act. All waste receipts will be kept on file for audit purposes.

Refer to Chapter 7 for a full list of proposed mitigation measures.

6.12 Bushfire risk

6.12.1 Existing environment

The Proposal site is mapped Bushfire Prone land within larger areas of Vegetation Category 3 and is directly bounded to the east by a large nature reserve, which is classified Vegetation Category 1 (Figure 26). To the west and south it is bounded by roads and the railway corridor which are classified as Vegetation Buffer. Another large, vegetated area classified Category 1 is located 400 metres to the west.

Vegetation Category 1 is considered to be the highest risk for bush fire (e.g. forests and woodlands), followed by Vegetation Category 3 (e.g. grasslands), with Vegetation Category 2 being considered the lowest risk category (lower risk vegetation parcels due to their shape, vegetation type or management practices).

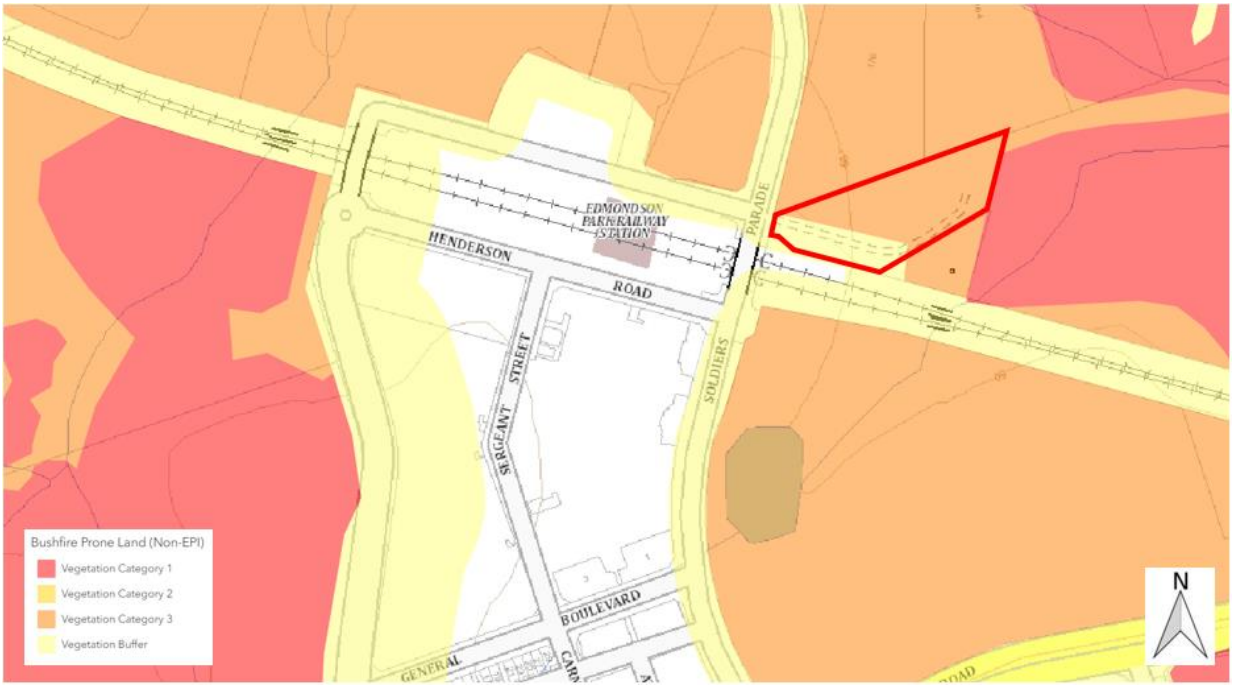

Figure 26: Bushfire Prone Land certified by the NSW Rural Fire Service (Proposal site shown in red) (Source: ePlanning Spatial Viewer, 2021)

6.12.2 Potential impacts

Construction phase

Some construction activities that may cause or increase the risk of bush fire include:

- site preparation activities such as vegetation removal and use of power tools
- operating a petrol, gas or diesel-powered vehicles or plants near land containing combustible material
- operating plant fitted with power hydraulics on land containing combustible material
- undertaking 'hot' works (for example welding, use of oxy acetylene torches)
- storage of fuel.

Due to the inherent risk category of the site itself and the proximity the vegetation to the east of the site, bushfire safety measures would need to be included into the CEMP and other relevant construction procedures (e.g. hot work permit system).

Operation phase

All vegetation would be removed from within the Proposal site for the purpose of constructing a multi-storey commuter car park and small areas of landscaping subject to detailed design would be established. The Proposal would be unlikely to increase bushfire risk in the vicinity.

6.12.3 Mitigation measures

Bushfire risk management measures would be incorporated in the CEMP to minimise risk of bushfire from construction activities particularly during high risk days. High risk activities would be undertaken with care or avoided where possible during high risk bushfire weather.

To minimise risk from bushfires to the Proposal during operation the following would be considered during detailed design:

- relevant requirements for bushfire prone land

- limited use of timber
- urban design is to limit selection of large canopy trees close to buildings
- adequate ventilation to minimise risk of bushfire smoke impacts
- Installation of fire-fighting systems such as sprinklers.
- portable fire extinguishers to be kept on machinery and equipment.

Refer to Chapter 7 for a full list of proposed mitigation measures.

6.13 Sustainability

The design of the Proposal would be based on Transport of NSW's commitment to delivering a sustainable transport system for NSW, including the application of the Transport for NSW Environmental Management System, which includes the use of the benchmarking tool, *TfNSW Climate Change Risk Assessment Guidelines* (TfNSW, 2021), *TfNSW Sustainable Design Guidelines Version 4.0* (TfNSW, 2019) and the *Carbon Estimation and Reporting Tool* (TfNSW, 2017).

A minimum of 90 per cent of construction waste and demolition waste (by weight) would aim to be diverted from landfill. All usable spoil would be to be beneficially reused on site where possible. Water consumption during construction would be monitored and reported on and consumption of potable water would be reduced where practicable.

Electric vehicle charging stations would be installed and future proofed in the Proposal to support low emission vehicles. Renewable energy options including rooftop solar panels, such as those shown in Figure 27, will be installed and provision of space for future batteries would be investigated in detailed design. WSUD would also be considered as identified in Section 6.9 to minimise impacts from stormwater runoff from the Proposal.

Figure 27 Example of rooftop solar panels on a car park

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 includes 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.

A climate risk assessment was undertaken for the Commuter Car Par Program (Transport for NSW, 2020), which identified the following key risks:

- extreme temperature events
- extreme rainfall events
- storms and strong winds
- bushfires.

Climate change could lead to an increase in the intensity of rainfall events, whereby the rainfall expected to occur in a one per cent Annual Exceedance Probability flood event would occur more frequently. The Proposal site is not located in an identified flood prone area however

WSUD options would be investigated during development of detailed design of the Proposal, along with identification of options to reduce the runoff burden to the proposed and existing drainage system.

Detailed design would consider inclusions to minimise impacts of extreme heat, including selection of materials for durability in extreme conditions and that minimise heat retention, urban design elements that provide adequate shade (such as rooftop shading provided by solar panels), and minimise water use. Furthermore the detailed design would consider relevant wind codes, surface water modelling and asset protection from hail and lightening.

Climate change could lead to an increase in frequency and severity in bushfires. The Proposal is situated on land mapped as Vegetation Category 3 and Vegetation Buffer zone and would be designed with appropriate fire protection measure as outlined in Section 6.12.

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 carbon foot printing exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (TfNSW, 2018) . The carbon footprint would to be used to inform decision making in design and construction, and ongoing operation of the building. Materials used in construction of the Proposal would be selected on the basis of sustainability principles, in particular low embodied carbon and use of recycled materials to minimise generation of greenhouse gases. Similarly during detailed design, the design, materials, fixtures and fittings will be selected to optimise the operational energy efficiency of the Proposal to reduce the projects lifecycle carbon impacts.

Greenhouse gas emissions resulting from the construction activities of the Proposal would be short-term and temporary. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Chapter 7.

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 many of these vehicles already travel to the station and park in the surrounding streets. However longer trips to major employment areas such as the CBD may be reduced through uptake of public transport. 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.

The Proposal would include renewable energy generation through the introduction of solar panels to the roof space, and will provide EV charging stations for commuters. By implementing renewable energy options, the operational car park would be less reliant on electricity from the grid.

6.16 Cumulative impacts

Cumulative impacts occur when two or more projects are carried out concurrently and in close proximity to one another. A search of the DPIE's Major Projects Register, Sydney Western City Planning Panel Development and Planning Register, and Liverpool City Development Application Register in October 2021 identified the following developments in Edmondson Park as recently determined, or are known to be under construction at this time:

- construction of the Edmondson Park Station (South) Commuter Car Park (completed in early 2022)

- constructions within the Edmondson Park South Town Centre to the south-west of the Proposal site
- construction of the extension of Buchan Avenue up to the intersection with Soldiers Parade.

A construction site has also been established on the southern side of the SWRL for Residential Precincts RP2 and RP3 in the Edmondson Park Masterplan. Vegetation clearing, bulk earthworks and temporary stormwater/drainage works have been undertaken.

A new primary school on Buchanan Avenue and a mixed use development comprising 676 residential apartments, 2000 sqm of retail floor space, a child care centre and supporting roads and infrastructure on Croatia Avenue are currently under assessment.

As the Proposal site is located in a growth area and an approved concept plan applies to the area, as described in Section 1.3.2, there is potential for development to be approved and commence during the construction period of the Proposal. Any developments occurring at the same time have the potential for cumulative impacts as further discussed below.

6.16.1 Potential impacts

Cumulative 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.

Cumulative impacts may occur as a result of construction activities occurring simultaneously with the projects listed above, projects that are currently underway, or other projects that are approved and commence during the proposed car park construction period. Developments proposed within proximity to the Proposal site have the potential to increase the number of construction vehicles on local roads, increase noise due to construction and have an impact on local visual amenity. Potential impacts may include:

- increased traffic on the surrounding roads and associated delays for road users, including the use of similar roads by construction vehicles, or if temporary road closures or detours are necessary across separate developments, this would increase potential for traffic congestion
- construction noise and vibration, for example where projects are in close proximity to one another and have similar approved construction hours
- reduced visual amenity, for example where multiple active construction sites are located in the same precinct.

Specific details of construction timeframes and impacts for surrounding local developments are subject to ongoing consultation with relevant stakeholders and landowners. There is also the potential for new developments to be approved and commence construction during the construction timeframe for the Proposal.

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 surrounding potential developments is released. Cumulative impacts would be minimised and managed through the application of environmental safeguards and management measures as summarised in Table 25.

6.16.2 Mitigation measures

Further consideration of cumulative impacts would be undertaken during detailed design and construction planning, in consultation with relevant stakeholders. Environmental management

measures would be developed and implemented as appropriate. Any additional mitigation measures that arise would be incorporated into relevant management plans, such as the Traffic Management Plan and Noise and Vibration Management Plan, and implemented accordingly.

During construction, the works would be co-ordinated with any other construction activities in the area. Further consultation would occur with Liverpool City Council and any developers identified to minimise cumulative construction impacts across the precinct, particularly relating to impacts such as traffic and noise.

Refer to Chapter 7 for a full list of proposed mitigation measures.

7 Environmental management

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

7.1 Environmental management plans

A CEMP for the construction phase of the Proposal would be prepared in accordance with the requirements of the Transport for NSW Environmental Management System by the Construction Contractor and approved by TfNSW. 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.
- Bushfire Management Plan
- Chance Find Management Plan

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

7.2 Mitigation measures

Mitigation measures for the Proposal are listed in Table 25. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 25 Proposed mitigation measures

No.	Mitigation measure
	General
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the Construction 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 Construction 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 Construction Contractor in accordance with Transport for NSW's *Guide to Environmental Controls Map* (Transport for NSW, 2021) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.

No.	Mitigation measure
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.
6.	Service relocation would be undertaken in consultation with the relevant authority. Contractors would mark existing services on a services plan included with 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 transport
8.	Prior to the commencement of construction, a Construction Traffic Management Plan (CTMP) 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 railway stations, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made) • managing impacts and changes to on and off-street parking and requirements for any temporary replacement provision • parking locations for construction workers away from stations and busy residential areas and details of how this would be monitored for compliance • routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses • details for rail replacement bus stops if required, including appropriate signage to direct patrons, in consultation with the relevant bus operators. Particular provisions would also be considered for the accessibility impaired • communication with adjacent construction sites regarding traffic management measures and changes to parking, pedestrian access and/or traffic conditions • measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the CTMP. Consultation with the relevant roads authorities would be undertaken during preparation of the CTMP. For surrounding projects that may be under construction concurrently with the Proposal, consultation will also be undertaken with the proponent(s) to consider opportunities to reduce cumulative impacts of construction traffic. 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.
10.	Road Occupancy Licences for temporary road closures would be obtained, where required.

No.	Mitigation measure
11.	During detailed design consideration would be given to the following recommendation from the TTIA (SCT Consulting, 2022): • an unsignalised pedestrian crossing on the Proposal Access Road and a signalised pedestrian crossing on the north approach of the Soldiers Parade / Henderson Road intersection are provided. The unsignalised marked crossing is to be located 45 metres from the Soldiers Parade road reserve boundary to provide for safe sight distance at the crossing • pedestrian fencing in the existing median along Soldiers Parade north of Henderson Road is provided to improve pedestrian safety in the vicinity of the site.
	Landscape and visual amenity
12.	An Urban Design and Landscape Plan is to be submitted to Transport for NSW. The Urban Design and Landscape Plan is to address the fundamental design principles as outlined in 'Around the Tracks' - urban design for heavy and light rail, TfNSW, Interim 2016. The Urban Design and Landscaping Plan shall: • demonstrate a robust understanding of the site through a comprehensive site analysis to inform the design direction, demonstrate connectivity with street networks, transport modes, active transport options, and pedestrian distances • identify opportunities and challenges • establish site specific principles to guide and test design options • demonstrate how the preferred design option responds to the design principles established in Transport for NSW Urban Design Guidelines, including consideration of Crime Prevention through Environmental Design Principles. The Urban Design Plan and Landscaping Plan is to include the Public Domain Plan for the chosen option and would provide analysis of the: • landscape design approach including design of pedestrian and bicycle pathways, street furniture, interchange facilities, new planting and opportunities for public art • materials schedule including materials and finishes for proposed built work, colour schemes, paving and lighting types for public domain, fencing and landscaping • an Artist's Impression or Photomontage to communicate the proposed changes to the precinct The following design guidelines are available to assist and inform the Urban Design Plan for the Proposal: • *'Around the Tracks' Urban Design for Heavy and Light Rail*, TfNSW, Interim 2016 • *TAP Urban Design Plan, Guidelines*, TfNSW, Draft 2018 • *Commuter Car Parks, urban design guidelines*, TfNSW, Interim 2017 • *Managing Heritage Issues in Rail Projects Guidelines*, TfNSW, Interim 2016 • *Creativity Guidelines for Transport Systems*, TfNSW, Interim 2016 • *Water Sensitive Urban Design Guidelines for Transport for NSW Projects*, 2016. The Urban Design Plan and Landscaping Plan shall be: • Prepared prior to finalisation of the detailed design • Prepared in consultation with Liverpool City Council and relevant stakeholders • Prepared by a registered Architect and/or Landscape Architect
13.	Multiple façade designs would be considered and analysed during detailed design to ensure an attractive and appropriate finish.
14.	All permanent lighting would be designed and installed in accordance with the requirements of standards relevant to *AS 1158 Road Lighting* and *AS 4282 Controlling the Obtrusive Effects of Outdoor Lighting.*

No.	Mitigation measure
15.	Worksite compounds would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
16.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
17.	During construction, graffiti would be removed in accordance with Transport for NSW's Standard Requirements.
18.	During detailed design the plans are to be prepared in accordance with the recommendations in the Landscape and Visual Impact Assessment for the Proposal (Envisage Consulting, 2022) including: • retain existing trees along the western boundary of the Proposal site to soften the façade and break up the extent of hard surfacing/built structures when viewed from the station and town centre • supplement existing tree planting along the western boundary if trees are removed or damaged during construction to maintain a dense, vegetated screen of lower floor levels • retain existing trees along the northern boundary of the Proposal site (if possible), to screen the lower floor levels of the Proposal (until such time their removal is required for planned town centre precinct development). • include feature tree planting around the Proposal, particularly along the southern boundary, to soften the building when viewed from the town centre and provide amenity and shade for pedestrians moving between the car park and the Station • use a common theme/style for new elements like seating, paving, signage, and lights, to enhance the character of the area and provide consistency with the station precinct • install a well-designed pedestrian walkway between the station and the Proposal, including a wide footpath, lighting, CCTV and way finding signage. • use high quality materials and an integrated colour palette consistent with the station precinct • select materials and colours to minimise the visual prominence of the Proposal, however, colour could be incorporated as a design feature (if consistent with the UDLP) • recessive colours for fencing (with low reflectivity and high grey content) to be less visible • avoid highly reflective materials in the construction of the Proposal to reduce potential glare impacts.
	Noise and vibration
19.	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 NSW *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009) and *Construction Noise and Vibration Strategy* (TfNSW, 2019) and the Noise and Vibration Impact Assessment for the Proposal (PWNA, 2022). The CNVMP would take into consideration Standard management measures (e.g. periodic receiver notification and employee training and induction), source mitigation measures (e.g. use of quieter and less vibration emitting construction methods, non-tonal reverse beepers) and path mitigation measures (e.g. use of structures to shield residential receivers) to reduce construction noise and vibration where feasible and reasonable.
20.	The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include: • regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise

No.	Mitigation measure
	• erecting temporary noise barriers before work commences to ensure noise is minimised during the entire shift • avoiding any unnecessary noise when carrying out manual operations and when operating plant • ensuring spoil is placed and not dropped into awaiting trucks • avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable • switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded • avoiding deliveries at night/evenings wherever practicable • no idling of delivery trucks • keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site • minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios onsite; no dropping of materials from height where practicable, no throwing of metal items and slamming of doors, controlled release of compressed air.
21.	The CNVMP would include measures to reduce the construction noise and vibration impacts from mechanical activities. Reasonable and feasible noise mitigation options which would be considered, include: • maximising the offset distance between noisy plant and adjacent sensitive receivers and determining safe working distances • using the most suitable equipment necessary for the construction work at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours work • use of quieter and less vibration emitting construction methods where feasible and reasonable • maximising shielding between plant and adjacent sensitive receivers by making use of temporary structures and stockpiles, and barriers • scheduling work generating high noise and/or vibration during less sensitive time periods • Plan traffic flow, parking and loading/unloading areas to minimise reversing movements within the site.
22.	A noise monitoring program would be included in the CVMP and implemented to quantify noise emissions from construction activities and guide practical reasonable and feasible noise control measures.
23.	Work would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any work outside these hours may be undertaken if approved by Transport for NSW and the community is notified prior to work commencing. An Out of Hours Work application form would need to be prepared by the Construction Contractor and submitted to the Transport for NSW Senior Environment and Sustainability Officer for any work outside standard hours.

No.	Mitigation measure
24.	Where the $L_{Aeq\ (15minute)}$ construction noise levels are predicted to exceed 75 dBA and/or 30 dBA above the Rating Background Level at nearby affected sensitive receivers, respite periods would be observed, where practicable, and in accordance with Transport for NSW's *Construction Noise and Vibration Strategy* (TfNSW, 2019). This would include restricting the hours that very noisy activities can occur.
25.	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.
26.	Vibration resulting from construction and received at any structure outside of the Proposal area would be managed in accordance with: • for structural damage vibration - the vibration objectives outlined in Transport for NSW's *Construction Noise and Vibration Strategy* which includes British Standard BS 7385-2:1993 *Evaluation and measurement for vibration in buildings Part 2* • for human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS 7385-2:1993 *Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).*
27.	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 work (unless otherwise determined following additional assessment they are not likely to be adversely affected).
28.	Affected pre-schools, schools and other identified sensitive receivers are to be consulted in relation to noise mitigation measures to identify any noise sensitive periods. As much as reasonably possible noise intensive construction work in the vicinity of affected educational buildings are to be minimised.
	Aboriginal heritage
29.	All construction staff would undergo an induction in the recognition of Aboriginal cultural heritage material. This training would include information such as the importance of Aboriginal cultural heritage material and places to the Aboriginal community, as well as the legal implications of removal, disturbance and damage to any Aboriginal cultural heritage material and sites.
30.	If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (TfNSW, 2021) would be followed, and work within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Senior Environment and Sustainability Officer so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, EES Group and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and EES Group notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location.
31.	Facade treatments and any public art installations are, where practical, to consider the commitments of the TfNSW *Aboriginal Cultural and Heritage Framework* and the guiding principles, governance and protocols of the TfNSW *Aboriginal Art Strategy*.

No.	Mitigation measure
	Non-Aboriginal heritage
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, 2021) would be followed, and work within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Senior Environment and Sustainability Officer so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and DPIE. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to work recommencing at the location.
	Biodiversity
33.	Construction of the Proposal must be undertaken in accordance with Transport for NSW's *Vegetation Management (Protection and Removal) Guideline* (TfNSW, 2019) and Transport for NSW's *Fauna Management Guideline* (TfNSW, 2019).
34.	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.
35.	Should the detailed design or onsite work determine the need to remove or trim any trees, the Construction Contractor would be required to complete Transport for NSW's Removal or Trimming Vegetation Application and submit it to Transport for NSW for approval.
36.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees to be retained would be protected through temporary protection measures discussed below.
37.	Tree Protection Zones (TPZs) would be established around trees to be retained. Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs. Mitigation measures described in the Arborist Impact Assessment Report (Aborcultural Consultancy Australia, 2022) would also be followed.
38.	In the event of any tree to be retained becoming damaged during construction, the Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Senior Environment and Sustainability Officer to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.
39.	Weed control measures, consistent with Transport for NSW's *Weed Management and Disposal Guideline* (TfNSW, 2019), 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.*
40.	Landowners consent would be obtained prior to vegetation removal assessed under the REF, should TAHE not be the landowner.
41.	A suitably qualified ecologist would be present to check for fauna during the removal of any hollow bearing trees.

No.	Mitigation measure
42.	Offset for tree removal and landscaping would be undertaken in accordance with Transport for NSW's Vegetation Offset Guide (Transport for NSW, 2019) and in consultation with Council, and/or the owner of the land upon which the vegetation is to be planted.
	Socio-economic
43.	Sustainability criteria for the Proposal would be established in accordance with the Social Procurement Workforce Strategy to encourage the Construction Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.
44.	Feedback through the consultation process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
45.	A CLMP 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.
46.	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.
47.	The community would be kept informed of construction progress, activities and impacts in accordance with the CLMP to be developed prior to construction.
48.	Temporary accessible toilet facilities for staff would be provided while permanent accessible staff toilets are not available. Inclusion of permanent accessible staff toilets within the Proposal would be investigated during detailed design.
	Soils and water
49.	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* (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.
50.	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.
51.	Stockpiles would be located outside of drainage paths and away from drainage lines.
52.	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.
53.	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, 2021).

No.	Mitigation measure
54.	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, 2021) 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.
55.	In the event of a pollution incident, work would cease in the immediate vicinity and the Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Senior Environment and Sustainability Officer . The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the PoEO Act.
56.	An on-site water quality treatment system to treat the stormwater generated from the site, prior to discharging it to the receiving land/water bodies is to be incorporated in the design and installed to meet Liverpool City Council standards and requirements.
57.	Once Council stormwater reticulation is introduced, connections to the stormwater and drainage infrastructure would be made in accordance with the relevant Transport for NSW and Liverpool City Council standards and requirements.
58.	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, 2019).
59.	Implementation of WSUD would be investigated during detailed design and incorporated where possible.
	Air quality
60.	Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's *Air Quality Management Guideline* (TfNSW, 2021).
61.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
62.	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.
63.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
64.	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.

No.	Mitigation measure
	Waste and contamination
65.	A Waste Management Plan is to be prepared as part of the CEMP to address waste management and would at a minimum: • identify all potential waste streams associated with the works and outline methods of disposal of waste, which 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.
66.	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.
67.	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.
68.	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal.
69.	Any concrete washout would be established and maintained in accordance with Transport for NSW's *Concrete Washout Guideline* – (TfNSW, 2021) with details included in the CEMP and location marked on the ECM.
	Bushfire Risk
70.	Bushfire risk management measures would be incorporated in the CEMP to minimise risk of bushfire from construction activities particularly during high risk days. High risk activities would be undertaken with care or avoided where possible during high risk bushfire weather.
71.	To minimise risk from bushfires to the Proposal during operation the following would be considered during detailed design: • relevant requirements for bushfire prone land • limited use of timber • urban design is to limit selection of large canopy trees close to buildings • adequate ventilation to minimise risk of bushfire smoke impacts.
	Sustainability, climate change and greenhouse gases
72.	Detailed design and construction of the Proposal is to be undertaken in accordance with the *TfNSW Sustainable Guidelines Version 4.0*
73.	The detailed design process would undertake a carbon foot printing exercise in accordance with Transport for NSW's Carbon Estimate and Reporting Tool Manual (TfNSW, 2018). The carbon footprint would to be used to inform decision making in design and construction.
74.	Investigation of renewable energy systems during detailed design to be incorporated into the operation of the car park.
75.	Water consumption during construction would be monitored and reported on and consumption of potable water would be reduced where practicable.

No.	Mitigation measure
76.	Detailed design would consider inclusions to minimise impacts of extreme heat, including selection of materials for durability in extreme conditions and that minimise heat retention, urban design elements that provide adequate shade, and minimise water use. Relevant wind codes, surface water modelling and asset protection from hail and lightening would also be considered during detailed design.
	Cumulative
77.	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.
78.	Consultation with relevant stakeholders undertaking development in the vicinity of the Proposal would be undertaken prior to finalisation of the detailed design.

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 Edmondson Park Station facilitating improved opportunities to change modes of transport
- increasing accessibility and convenience to and from Edmondson Park Station potentially increasing the use of public transport
- improved customer experience by providing modern car parking facilities with weather protection, electric vehicle charging facilities, and security features including lighting and CCTV cameras
- reduction of the need for commuters to park in local streets, and illegal parking behaviours, 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 construction of the proposed car park
- additional inbound and outbound trips during operation, however key intersections are forecast to operate at the same satisfactory levels of service with some reserve capacity to accommodate future growth
- moderate noise impacts for some residential receivers during construction
- temporary and permanent changes to access arrangements (including pedestrian diversions) and minor delays on the adjacent road network during construction
- temporary visual impacts during the construction and permanent visual impacts of a new structure.
- removal of approximately 14 trees of transient planted native vegetation species.

This REF has considered and assessed these impacts in accordance with section 171 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 has also taken into account the principles of ESD and sustainability (refer to Section 3.2.3 and Section 6.13). These would be considered further during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

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Appendix A 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 Australian Department of Agriculture, Water and 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 of 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 is for a transport facility and does not relate to coal seam gas or mining.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be undertaken on or near any Commonwealth land.	Nil

Appendix B Consideration of section 171

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 a new visible element through the construction of a new multi-storey car park in a currently vacant block north-east of Edmondson Park Station. The Proposal is consistent with the land use and building height controls for the site and 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 significant clearing and modification of the site during the construction of the SWRL, the Proposal would have a negligible impact on the local ecosystem as discussed in Section 6.5.	Negligible
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? Some short-term impacts during construction would be anticipated, particularly in relation to noise, traffic and access and visual amenity. There would be some moderate impacts to visual amenity in particular for future residents adjacent the Proposal site. The visual impacts from the Proposal are anticipated to be low-moderate for adjacent residents during operation. A landscape and visual impact assessment was completed and is summarised in Section 6.2.	Moderate
(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 any registered heritage items, and any items or sites of Aboriginal Heritage significance are unlikely to be harmed by the Proposal. The visual impacts from the Proposal are anticipated to be low-moderate. During operation the Proposal would have positive impacts to the community through providing a modern car park structure with improved access, lighting and safety measures (such as CCTV). The car park would be consistent with the form and scale of adjacent developments being/to be constructed as part of the Edmondson Park South town centre.	Minor

Factor	Impacts
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The site was heavily modified (completely cleared of all vegetation) during the construction of the SWRL and as such impacts on the habitat of protected fauna are likely to be negligible. The site is biocertified under Part 7 of Schedule 7 of the (then) *Threatened Species Conservation Act 1995* such that development of the site is not likely to significantly affect threatened species or ecological communities (see Section 6.7).	Negligible
(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 (see Section 6.5).	Negligible
(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 development of a greenfields site and minor earthworks. Impacts from the Proposal would be minimised by the implementation of the mitigation measures identified in Chapter 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 the 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 with 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.	Negligible
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Proposal is unlikely 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 6.16 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.	Minor
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The Proposal is not located in the coastal zone and would not affect or be affected by any coastal processes or hazards.	Nil
q) Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1, The Proposal is consistent with the objectives of State Environmental Planning Policy (Precincts – Western Parkland City) 2021, which seek to provide a mixture of compatible land uses and maximise public transport patronage. The Proposal will comply with the maximum height prescribed for the zone in Clause 18 of the SEPP, and while the Proposal will impact some trees, they are identified as of low retention value, and the Proposal will preserve trees to the west of the building footprint and on neighbouring properties consistent with Clause 31 of the SEPP.	Minor
r) Other relevant environmental factors In considering the potential impacts of this proposal all relevant environmental factors have been considered, refer to Chapter 6 of this assessment.	Minor