Transport for NSW
Commuter Car Park Program
Edmondson Park Station (South)
Review of Environmental Factors

Artist’s impression of the Edmondson Park Station Commuter Car Park, subject to change during detailed design.
Edmondson Park Station (South) Commuter Car Park

Review of Environmental Factors

Commuter Car Park Program
Ref – 6440686
Contents

Abbreviations ........................................................................................................... 6

Definitions ............................................................................................................... 8

Executive summary ............................................................................................ 10

1 Introduction ........................................................................................................ 15
  1.1 Overview ........................................................................................................... 15
  1.2 The Proposal .................................................................................................. 16
  1.3 Location and existing infrastructure ............................................................... 16
  1.4 Purpose of this Review of Environmental Factors ........................................... 24

2 Need and options considered ........................................................................... 25
  2.1 Strategic justification ..................................................................................... 25
  2.2 Future Transport Context – Sydney’s South West .......................................... 27
  2.3 Objectives of the Proposal ............................................................................ 29
  2.4 Options considered ....................................................................................... 29
  2.5 Justification for the preferred option .............................................................. 31

3 Proposal description .......................................................................................... 33
  3.1 Scope of works ............................................................................................... 33
  3.2 Design development ..................................................................................... 36
  3.3 Construction activities .................................................................................. 37
  3.4 Property acquisition ..................................................................................... 41
  3.5 Operation and maintenance ......................................................................... 41

4 Statutory considerations .................................................................................... 42
  4.1 Commonwealth legislation .......................................................................... 42
  4.2 NSW legislation and regulations ................................................................. 43
  4.3 Ecologically sustainable development ....................................................... 49

5 Community and stakeholder consultation ....................................................... 50
  5.1 Stakeholder consultation during scoping design ............................................ 50
  5.2 Consultation requirements under the Infrastructure SEPP ........................... 50
  5.3 Consultation strategy .................................................................................... 51
  5.4 Community consultation during REF .......................................................... 52
  5.5 Ongoing consultation ................................................................................... 57

6 Environmental impact assessment ..................................................................... 58
  6.1 Traffic and transport .................................................................................... 58
  6.2 Landscape and visual amenity ..................................................................... 66
  6.3 Noise and vibration ..................................................................................... 75
  6.4 Aboriginal heritage ...................................................................................... 86
  6.5 Biodiversity .................................................................................................. 87
  6.6 Socio-economic impacts .............................................................................. 90
  6.7 Contamination, geology and soils ............................................................... 91
  6.8 Hydrology and water quality ...................................................................... 93
  6.9 Air quality .................................................................................................... 97
  6.10 Waste and resources .................................................................................. 99
  6.11 Bushfire risk ............................................................................................... 100
  6.12 Non-Aboriginal heritage ........................................................................... 101
  6.13 Sustainability .............................................................................................. 102
  6.14 Climate change .......................................................................................... 103
6.15 Greenhouse gas emissions ................................................................. 104
6.16 Cumulative impacts ........................................................................ 104

7 Environmental management ............................................................... 107
  7.1 Environmental management plans .................................................. 107
  7.2 Mitigation measures ........................................................................ 107

8 Conclusion .......................................................................................... 117

References ............................................................................................. 118

Appendix A Consideration of matters of National Environmental Significance..... 121
Appendix B Consideration of clause 228 ................................................... 122

Document control

Status: Final

Prepared by: Eleanor Parry, Jessica Berry

Reviewers: Shani Archer, Ashe Earl-Peacock, Tonu Aisatullin, Tracey Leotta, Ben Groth, Ben Grogan

Date of issue: May 2020

Version: 0.1

© Transport for NSW
Figures

Figure 1 Proposed Edmondson Park Station (South) Commuter Car Park (indicative only, subject to detailed design) .................................................................11
Figure 2 Planning approval and consultation process for the Proposal .................................................13
Figure 3 Regional context ...................................................................................................................17
Figure 4 Proposal site locality map (base map: NearMap, 2020) ...........................................................19
Figure 5 The Proposal site and Henderson Road looking west from the station .................................20
Figure 6 The existing car park looking east from the south west corner of the Proposal site ...21
Figure 7 Staff facilities / accessible toilet block in the north west corner of the Proposal site...21
Figure 8 Edmondson Park South Concept Plan (Proposal site shown in purple) ..........................23
Figure 9 Car park footprint shown in white (indicative only and subject to detailed design). ....34
Figure 10 Three dimensional overview of proposed commuter car park looking from the south west with surrounding topography (indicative only and subject to detailed design) ..........35
Figure 11 Site establishment plan outlining temporary site facilities (subject to contractor requirements) .......................................................................................41
Figure 12 State Significant Precincts SEPP zoning map .................................................................48
Figure 13 Planned road network under the Edmondson Park South Concept Plan (Frasers Property 2018) ...........................................................................60
Figure 14 Road access network ....................................................................................................61
Figure 15 Predicted traffic access to the Proposal .........................................................................65
Figure 16 View of Proposal site (at-grade car park) looking east towards developing town centre ....................................................................................................67
Figure 17 Approximate visibility of the Proposal and assessed viewpoints ......................................69
Figure 18 Photomontage of Proposal looking west from the station (indicative only and subject to detailed design) .............................................................................73
Figure 19 Study showing predicted solar access impacts on 9.00 am to 3.00 pm on 21 June (winter solstice) from the proposed car park shown in green. ..............................................74
Figure 20 Map of Proposal site, receivers, general area of works and compounds .......................76
Figure 21 Receiver locations in close proximity to the Proposal site ...........................................77
Figure 22 Photo of vegetation present in the Proposal site ...........................................................87
Figure 23 Biodiversity certified land (Liverpool City Council, 2020) .............................................88
Figure 24 Waterways and waterbodies around the Proposal site ...................................................95
Figure 25 Flood planning areas under the State Significant Precincts SEPP (Proposal site shown in red) ..............................................................................................................96
Figure 26 Example of rooftop solar panels on a car park ................................................................103
## Tables

Table 1 Objectives of the Commuter Car Park Program ................................................................. 15
Table 2 Key NSW Government policies and strategies applicable to the Proposal ................. 26
Table 3 Options considered for the Proposal ............................................................................. 29
Table 4 Indicative construction staging for key activities .......................................................... 38
Table 5 Other Commonwealth legislation applicable to the Proposal ..................................... 42
Table 6 Other NSW legislation applicable to the Proposal .......................................................... 44
Table 7 Relevant provisions of the State Significant Precincts SEPP (Part 31 of Schedule 1) 47
Table 8 Infrastructure SEPP consultation requirements ............................................................ 50
Table 9 Community feedback themes ......................................................................................... 53
Table 10 Existing intersection performance .............................................................................. 62
Table 11 Existing and operational intersection performance ..................................................... 66
Table 12 Summary of visual impacts on viewpoints (VP) ............................................................ 71
Table 13 Noise monitoring locations .......................................................................................... 78
Table 14 Unattended noise monitoring results .......................................................................... 78
Table 15 Measured road traffic noise levels at EDP1 ................................................................. 78
Table 16 ICNG recommended NMLs ......................................................................................... 79
Table 17 NMLs at surrounding receivers .................................................................................. 80
Table 18 Predicted Noise Levels exceeding NMLs during façade installation ......................... 81
Table 19 Road traffic noise assessment criteria ......................................................................... 84
Table 20 Tree offset findings ...................................................................................................... 89
Table 21 Non-Aboriginal heritage items near the Proposal ......................................................... 101
Table 22 Proposed mitigation measures ...................................................................................... 107
## Abbreviations

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHIMS</td>
<td>Aboriginal Heritage Information Management System</td>
</tr>
<tr>
<td>AS</td>
<td>Australian Standard</td>
</tr>
<tr>
<td>ASS</td>
<td>Acid Sulfate Soils</td>
</tr>
<tr>
<td>BC Act</td>
<td><em>Biodiversity Conservation Act 2016</em> (NSW)</td>
</tr>
<tr>
<td>CBD</td>
<td>Central Business District</td>
</tr>
<tr>
<td>CEMP</td>
<td>Construction Environmental Management Plan</td>
</tr>
<tr>
<td>CCTV</td>
<td>Closed circuit television</td>
</tr>
<tr>
<td>CLM Act</td>
<td><em>Contaminated Land Management Act 1997</em> (NSW)</td>
</tr>
<tr>
<td>CLMP</td>
<td>Community Liaison Management Plan</td>
</tr>
<tr>
<td>CNVMP</td>
<td>Construction Noise and Vibration Management Plan</td>
</tr>
<tr>
<td>CTMP</td>
<td>Construction Traffic Management Plan</td>
</tr>
<tr>
<td>DBH</td>
<td>Diameter Breast Height</td>
</tr>
<tr>
<td>DPIE</td>
<td>NSW Department of Planning, Industry and Environment</td>
</tr>
<tr>
<td>ECM</td>
<td>Environmental Controls Map</td>
</tr>
<tr>
<td>EES Group</td>
<td>Environment, Energy and Science Group in the Department of Planning,</td>
</tr>
<tr>
<td></td>
<td>Industry and Environment (formerly known as Office of Environment and</td>
</tr>
<tr>
<td></td>
<td>Heritage)</td>
</tr>
<tr>
<td>EPA</td>
<td>Environment Protection Authority</td>
</tr>
<tr>
<td>EP&amp;A Act</td>
<td><em>Environmental Planning and Assessment Act 1979</em> (NSW)</td>
</tr>
<tr>
<td>EP&amp;A Regulation</td>
<td><em>Environmental Planning and Assessment Regulation 2000</em> (NSW)</td>
</tr>
<tr>
<td>EPBC Act</td>
<td><em>Environment Protection and Biodiversity Conservation Act 1999</em> (Cwlth)</td>
</tr>
<tr>
<td>EPL</td>
<td>Environment Protection Licence</td>
</tr>
<tr>
<td>ESD</td>
<td>Ecologically Sustainable Development (refer to Definitions)</td>
</tr>
<tr>
<td>FM Act</td>
<td><em>Fisheries Management Act 1994</em> (NSW)</td>
</tr>
<tr>
<td>Heritage Act</td>
<td><em>Heritage Act 1977</em> (NSW)</td>
</tr>
<tr>
<td>ICNG</td>
<td><em>Interim Construction Noise Guideline</em> (Department of Environment and</td>
</tr>
<tr>
<td></td>
<td>Climate Change, 2009).</td>
</tr>
<tr>
<td>Infrastructure SEPP</td>
<td><em>State Environmental Planning Policy (Infrastructure) 2007</em> (NSW)</td>
</tr>
<tr>
<td>IS rating</td>
<td>Infrastructure Sustainability rating under ISCA rating tool (v 1.2)</td>
</tr>
<tr>
<td>Term</td>
<td>Meaning</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------------------------------------------------------------</td>
</tr>
<tr>
<td>ISCA</td>
<td>Infrastructure Sustainability Council of Australia</td>
</tr>
<tr>
<td>LEP</td>
<td>Local Environmental Plan</td>
</tr>
<tr>
<td>LGA</td>
<td>Local Government Area</td>
</tr>
<tr>
<td>MCA</td>
<td>Multi-criteria analysis</td>
</tr>
<tr>
<td>NES</td>
<td>National Environmental Significance (refers to matters of National</td>
</tr>
<tr>
<td></td>
<td>Environmental Significance under the EPBC Act)</td>
</tr>
<tr>
<td>NPW Act</td>
<td><em>National Parks and Wildlife Act 1974 (NSW)</em></td>
</tr>
<tr>
<td>NSW</td>
<td>New South Wales</td>
</tr>
<tr>
<td>OEH</td>
<td>NSW Office of the Environment and Heritage</td>
</tr>
<tr>
<td>PDP</td>
<td>Public Domain Plan</td>
</tr>
<tr>
<td>PoEO Act</td>
<td><em>Protection of the Environment Operations Act 1997 (NSW)</em></td>
</tr>
<tr>
<td>REF</td>
<td>Review of Environmental Factors (this document)</td>
</tr>
<tr>
<td>Roads Act</td>
<td><em>Roads Act 1993 (NSW)</em></td>
</tr>
<tr>
<td>SEPP</td>
<td>State Environmental Planning Policy</td>
</tr>
<tr>
<td>SHI</td>
<td>State Heritage Inventory</td>
</tr>
<tr>
<td>SHR</td>
<td>State Heritage Register</td>
</tr>
<tr>
<td>SREP</td>
<td>Sydney Regional Environmental Plan</td>
</tr>
<tr>
<td>Transport for NSW</td>
<td>Transport for New South Wales</td>
</tr>
<tr>
<td>TPZ</td>
<td>Tree Protection Zone</td>
</tr>
<tr>
<td>UDP</td>
<td>Urban Design Plan</td>
</tr>
<tr>
<td>WARR Act</td>
<td><em>Waste Avoidance and Resource Recovery Act 2001 (NSW)</em></td>
</tr>
<tr>
<td>WM Act</td>
<td><em>Water Management Act 2000 (NSW)</em></td>
</tr>
</tbody>
</table>
### Definitions

<table>
<thead>
<tr>
<th>Term</th>
<th>Meaning</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Average Exceedance Probability</strong></td>
<td>The likelihood of occurrence, expressed in terms of percentage, of a flood events 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.</td>
<td></td>
</tr>
<tr>
<td><strong>Concept design</strong></td>
<td>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).</td>
<td></td>
</tr>
<tr>
<td><strong>Design and Construct Contract</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Determining Authority</strong></td>
<td>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&amp;A Act).</td>
<td></td>
</tr>
<tr>
<td><strong>Disability Standards for Accessible Public Transport</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Ecologically Sustainable Development</strong></td>
<td>As defined by clause 7(4) Schedule 2 of the EP&amp;A Regulation.</td>
<td>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.</td>
</tr>
<tr>
<td><strong>Feasible</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Interchange</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Out of hours works</strong></td>
<td>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).</td>
<td></td>
</tr>
<tr>
<td><strong>Proponent</strong></td>
<td>A person or body proposing to carry out an activity under Division 5.1 of the EP&amp;A Act.</td>
<td></td>
</tr>
<tr>
<td><strong>Reasonable</strong></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td><strong>Sensitive receivers</strong></td>
<td>Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.</td>
<td></td>
</tr>
<tr>
<td>Term</td>
<td>Meaning</td>
<td></td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td><strong>The Proposal</strong></td>
<td>The construction and operation of the Edmondson Park Station (South) Commuter Car Park.</td>
<td></td>
</tr>
<tr>
<td><strong>Vegetation Offset Guide</strong></td>
<td>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&amp;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.</td>
<td></td>
</tr>
<tr>
<td>(Transport for NSW, 2019)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Executive summary

Overview

Transport for NSW is proposing to undertake the Edmondson Park Station (South) 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 car park with up to 1,000 additional commuter car parking spaces over the existing at-grade car park directly south 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 five levels (including rooftop) connected by lifts, stairs and internal ramps, with provision of approximately 1,000 commuter car parking spaces
- road work to provide separate pedestrian and vehicle access and egress from the proposed car park
- ancillary works including services diversion and/or relocation, drainage works, installation of lighting, installation of handrails and balustrades, with new infrastructure (including closed circuit television cameras)

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-2020 and is expected to be complete in mid-2021. 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.
Need for the Proposal

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

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

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

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 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 March and April 2020 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 have reviewed and assessed all feedback received during the public display period, prior to determining whether or not to proceed with the Proposal.

**Feedback can be sent to:**
- projects@transport.nsw.gov.au
- Commuter Car Park Program – Edmondson Park South
  Transport for NSW
  Locked Bag 6501
  St Leonards NSW 2065

**Or submitted:**
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 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:
• temporary changes to access arrangements (including pedestrian diversions) and minor delays on the adjacent road network during construction
• loss of vegetation within the Proposal site which would be offset in accordance with the *Vegetation Offset Guide* (Transport for NSW, 2019)
• temporary visual, noise and vibration impacts during the construction period
• a minor increase in local traffic movements during operation of the proposed car park
• noise and visual impacts during operation including overshadowing associated with the new structure

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 clause 228 of the EP&A Regulation, to ensure that Transport for NSW takes into account to the fullest extent possible, all matters affecting or likely to affect the environment as a result of the Proposal.

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

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

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

1.1 Overview

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

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.

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

<table>
<thead>
<tr>
<th>Category</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessible services</td>
<td>• increase access to public transport for customers in their ‘first and last mile’ journey.</td>
</tr>
<tr>
<td>Successful Places</td>
<td>• complement and integrate with existing and future communities and support economic and place-making objectives in centres.</td>
</tr>
</tbody>
</table>
| 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. |
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 over the existing at-grade car park directly south of the station.

The Proposal is summarised as follows:

- a multi-storey car park with approximately 1,000 additional commuter car parking spaces and lift and stair access
- Transport Park&Ride infrastructure
- additional accessible parking spaces
- closed circuit television (CCTV), lighting and wayfinding signage for improved safety and security
- road pavement and pedestrian pathway upgrades
- provision for electric vehicle charging spaces, solar power 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-2020 and is expected to be complete in mid-2021.

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 south west 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 at the existing car park to the south of Edmondson Park Station as shown in Figure 4.

Construction of Edmondson Park Station and the existing surrounding commuter car parks was completed in 2015. A large proportion of the area surrounding the station has not been developed. The broader area consists of medium to low density residential developments. The nearest residential areas to the Proposal site are 400 metres north of Edmondson Park Station, with construction works in progress for new residential areas surrounding the site.

The Proposal site is an existing at-grade commuter car park managed by Transport for NSW. The Proposal site is bounded by Henderson Road and the rail corridor to the north, Bernera Road and green space to the west and mixed use development to the south and west. The Proposal site is legally described as Lot 3 DP1200987 and Part Lot 1 DP1215120 (Henderson Road corridor).
Figure 4 Proposal site locality map (base map: NearMap, 2020)
The existing car park currently provides 216 commuter parking spaces and is accessed via an unnamed road to the east of the Proposal site. The existing car park has landscaping in small garden beds containing shrubs and small to medium trees. Transport for NSW staff facilities and an accessible toilet block are located in the north west corner of the Proposal site. Pedestrian access to the station is via a pedestrian crossing directly north of the Proposal site over Henderson Road.

To the south and the east, the Proposal site is surrounded by development of the town centre core of Edmondson Park South. To the east, construction of residential multi-unit dwellings with ground floor commercial spaces is well progressed. A construction site has also been established to the south of the Proposal site, however it is currently used mostly for staff parking and site compounds.

Figure 5 The Proposal site and Henderson Road looking west from the station
Figure 6 The existing car park looking east from the south west corner of the Proposal site

Figure 7 Staff facilities / accessible toilet block in the north west corner of the Proposal site
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).

In 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 the Proposal site and the area surrounding the Station. The Concept Plan has been modified six times and an application to modify the Concept Plan is currently under assessment to reduce the size of the proposed school area and alter the planning controls on the area north of the Station. The Concept Plan as shown in Figure 8 below establishes the overall planning framework for the Edmondson Park South area (Frasers Property, 2018).
Figure 8 Edmondson Park South Concept Plan (Proposal site shown in purple)
1.4 Purpose of this Review of Environmental Factors

This REF has been prepared by pitt&sherry on behalf of Transport for NSW to assess the potential impacts of the Edmondson Park Station (South) 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 clause 228 of the Environment Planning and Assessment Regulation 2000 (the EP&A Regulation).

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

Having regard to the provisions of the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), this REF considers the potential for the Proposal to have a significant impact on matters of National Environmental Significance (NES) or Commonwealth land, and the need to make a referral to the Commonwealth Department of the Agriculture, Water and the Environment 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 (South) Commuter Car Park, the subject of this REF, forms part of the Commuter Car Park Program. This program is designed to improve customer access to the public transport network, encourage a mode shift away from private vehicles, and reduce congestion on our road network.

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

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

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

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

<table>
<thead>
<tr>
<th>Policy / Strategy</th>
<th>Overview</th>
<th>How the Proposal aligns</th>
</tr>
</thead>
</table>
| **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. |
| **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. |
## 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 2056* (Transport for NSW, 2018a) outlines the NSW Government’s vision for a connected roads and public transport network that has higher capacity, and gives people the freedom to choose how and when they get around, no matter where they live and work. It acknowledges that over the next 40 years, Greater Sydney is forecast to grow from a city of 5 million to 8 million people. At the same time, technology advancements will reshape how people and goods move around our city.

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

Instead of focusing on one CBD, the Greater Sydney Commission has established a vision for Sydney as a metropolis of three cities (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 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 and protect corridors of land that can be used to 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 Extension and the North South Rail Line (Sydney Metro Greater West) 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 South West Rail Link 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 and the South West Rail Link extension from Leppington as a high priority.

*Future Transport 2056* (Transport for NSW, 2018a) 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 South West Rail Link 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.

In the nearer term, several initiatives to improve bus services in the south west are planned from mid-2020. These include:

- additional services on routes 859 and 869 serving Edmondson Park
- additional services on route 841 serving Leppington
- additional services on route 896 serving Campbelltown
- new route linking Leppington and Carnes Hill via Austral.

An On Demand transport trial 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 (South) 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 considered for the Proposal.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Considerations</th>
</tr>
</thead>
</table>
| Option 1 | Multi-storey car park to the north of the station | close proximity to the station entrance
| | convert the existing at-grade car park north of Edmondson Park Station | land owned by Transport for NSW which enables the project to proceed without the need for property purchase and/or acquisition
| | access from Soldiers Parade. | construction would displace existing commuter car parking spaces
| | | central, town centre core location when compared to planned roads has the potential to cause traffic congestion. |
| Option 2 | multi-storey car park to the south of the station | close proximity to the station entrance
| | convert the existing at-grade commuter car park south of Edmondson Park Station | land owned by Transport for NSW which enables the project to proceed without the need for property purchase and/or acquisition
| | access from Soldiers Parade, Henderson Road and Bernera Road | opportunity to complement and integrate with future commercial development
<p>| | | construction would displace existing commuter car parking spaces. |</p>
<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Option 3</td>
<td>multi-storey car park to the north of the station &lt;br&gt;vacant site east of Soldiers Parade &lt;br&gt;NSW Government land &lt;br&gt;access from Soldiers Parade.</td>
<td>short walk to access the station &lt;br&gt;construction on the vacant site would minimise displacement of existing car parking spaces during construction &lt;br&gt;no existing pedestrian infrastructure to cross Soldiers parade from the site to the station entrance &lt;br&gt;irregular shaped parcel of land – not optimal for car park development &lt;br&gt;land agreement would need to be negotiated which would elongate delivery timeframe.</td>
</tr>
<tr>
<td>Option 4</td>
<td>multi-storey car park to the north of the station &lt;br&gt;vacant (private) land east of Soldiers Parade &lt;br&gt;access from Soldiers Parade.</td>
<td>construction on the vacant site would minimise displacement of existing car parking spaces during construction &lt;br&gt;no existing pedestrian infrastructure to cross Soldiers Parade from the site to the station entrance &lt;br&gt;land agreement would need to be negotiated which would elongate delivery timeframe &lt;br&gt;would require clearing of vegetation on non-biodiversity certified lands.</td>
</tr>
<tr>
<td>Option 5</td>
<td>multi-storey car park to the north of the station &lt;br&gt;vacant (private) land west of Soldiers Parade, approx. 600 metres north of the station &lt;br&gt;access from Soldiers Parade.</td>
<td>long distance from the station &lt;br&gt;construction on the vacant site would minimise displacement of existing car parking spaces during construction &lt;br&gt;pedestrian infrastructure partially available along Soldiers Parade &lt;br&gt;acquisition of private land required.</td>
</tr>
<tr>
<td>Option 6</td>
<td>multi-storey car park to the north of the rail corridor &lt;br&gt;vacant site approximately 500 metres west of the station.</td>
<td>construction on the vacant site would minimise displacement of existing car parking spaces during construction &lt;br&gt;long distance from the station &lt;br&gt;forms part of a potential future school site &lt;br&gt;no current road and pedestrian access (future planned road network still to be constructed).</td>
</tr>
<tr>
<td>Option</td>
<td>Description</td>
<td>Considerations</td>
</tr>
<tr>
<td>--------</td>
<td>-------------</td>
<td>----------------</td>
</tr>
</tbody>
</table>
| 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, existing access to the car park would remain the same and there would be no changes to the way the car park currently operates. The ‘do nothing’ option would not address the future demand for commuter car parking in the area, potentially limiting the use and investment in public transport and adding to vehicular kilometres 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 immediate 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. Everyday 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 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 was the 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.

Options 3, 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, the existing at-grade commuter car park south of Edmondson Park station, was identified as a preferred site because:

- it complements the town centre development by increasing connectivity for commuters without precluding future integration
- it is within easy walking distance of Edmondson Park Station
- it is on land owned by Transport for NSW and available for use immediately which enables the additional parking spaces to be promptly delivered for the community
- due to its location on the edge of the town centre, traffic to and from the car park would access via peripheral roads away from the town centre core
- it can achieve a design with suitable dimensions and shape in the context of the wider precinct, in accordance with relevant place-making and urban design principles.

The Proposal is considered the best outcome for commuters and future residents of the town centre as it would deliver a vital transport solution for Sydney’s southwest balanced with place-based outcomes to contribute to a vibrant town centre for Edmondson Park.

The preferred location is in close proximity to the station, providing convenient access to public transport as well as increased commuter connectivity to the town centre for access to the future shopping, dining and entertainment facilities.

The Proposal would provide opportunities to integrate with and enhance the town centre as it develops, as it would be designed in a way that does not preclude potential future uses (e.g. community or retail spaces on the ground floor, subject to separate future planning approvals).

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 façade 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 planned modifications to the network would help direct traffic away from the town centre, improve traffic flow in and around the station precinct and provide motorists with multiple options for accessing the station and car park.

Building on land owned by Transport for NSW is also advantageous as it enables construction to proceed promptly to provide the community with these much needed car parking spaces in a growing part of Sydney.
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 approximately 1,200 commuter car spaces over the existing at-grade car park directly south of Edmondson Park Station. As the existing site has 216 car parking spaces, the Proposal would provide approximately 1,000 additional car parking spaces at this location compared to existing.

The Proposal would include the following key elements:

- removal of the existing at-grade car park including demolition of the staff facilities and accessible toilet block
- provision of a ground level plus five levels (including rooftop) commuter car park including:
  - approximately 1,000 additional commuter car parking spaces
  - approximately 26 accessible parking spaces
  - two lifts and six sets of stairs
  - internal circulation ramps connecting the levels
  - provision for electric vehicle charging stations
  - Transport Park&Ride infrastructure
- vehicular access and egress from Henderson road directly north of the site
- separation of vehicle access points and pedestrian access paths
- installation of renewable energy options such as rooftop solar panels and battery storage
- ancillary works including services diversion and/or relocation, drainage works, landscaping, installation of lighting, installation of handrails and balustrades, with new infrastructure (including CCTV cameras).

Offset parking during construction would be provided station and would be assessed under a separate planning approval.

The general layout of key elements for Edmondson Park Station South Commuter Car Park are shown in Figure 9 and Figure 10.
Figure 9 Car park footprint shown in white (indicative only and subject to detailed design).
Figure 10 Three dimensional overview of proposed commuter car park looking from the south west with surrounding topography (indicative only and subject to detailed design).
3.1.1 Materials and finishes

The proposed multi-storey car park involves a ground floor concrete slab and the addition of five 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 natural design scheme – neutral tones to blend the car park with the natural elements of the neighbourhood, and to create a less obtrusive façade
- 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 carbon content, use of recycled materials and properties assist with the reduction of the urban heat island effect. Such materials may include recycled glass, lower carbon content concrete and permeable paving.
- availability and constructability criteria to ensure resources are readily available, and for the structure to be constructed with ease and proficiency.

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

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 structures:** the placement and integrity of existing structures was considered during development of the design – these structures included the surrounding residential and business premises currently in development.

**Sydney Trains’ requirements:** modifications for existing structures and new structures in close proximity to the railway line must be designed and constructed with consideration of train impact loads, structural clearances to the track, and safe working provisions. Existing access points to the rail corridor and associated infrastructure would be maintained.

**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 3.3.9.

**Other considerations:**

- minimising impacts to commuter parking and access to Edmondson Park Station
- construction activities underway adjacent the Proposal site
- sustainability including social, economic and environmental sustainability considerations as per Proposal objectives and achievement of an ISCA IS excellent rating.
3.2.2 Design standards

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

- National Construction Code
- relevant Australian Standards
- Asset Standards Authority standards
- *Transport for NSW Urban Design Guidelines*
- 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 supports ISCA and the Infrastructure Sustainability (IS) rating tool. The IS rating tool was developed and is administered by ISCA. It is an independently verified and nationally recognised rating system for evaluating sustainability across design, construction and operation of infrastructure.

The Proposal is targeting a rating of ‘Excellent’ using the ISCA IS Rating Tool v1.2. The rating scheme provides an independent and consistent methodology for the application and evaluation of sustainability outcomes in infrastructure projects. The sustainability outcomes address environmental, social, economic and governance aspects.

The IS Rating Scheme is grouped into six key themes:

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

These sustainability themes are divided into 15 performance categories, against which the Proposal would be independently assessed and assigned a rating level. The Proposal would need to achieve at between 50 and 75 points out of a possible 100 to be certified as ‘Excellent’.

3.3 Construction activities

3.3.1 Work methodology

Subject to approval, construction is expected to commence in mid-2020 and is expected to be complete in mid-2021. 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

<table>
<thead>
<tr>
<th>Stage</th>
<th>Activities</th>
</tr>
</thead>
</table>
| 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 trees and vegetation approved for removal  
|                                                                      | • removal of trees and vegetation  
|                                                                      | • removal of the existing at-grade car park including demolition of the staff facilities and toilet block.  |
| 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/façade                           | • 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  
|                                                                      | • completion of landscaping (subject to detailed design).  |
| Testing and commissioning                                           | • completion of various activities to test and commission power supply, lifts and lighting.  |
### 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
- helicopter (smoothing out concrete)
- rattles 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 wacker 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, 2018b) (refer to Section 6.3 for further details).

### 3.3.4 Extended Working Hours during COVID-19

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

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

As the determination of this REF for the Proposal would occur after the commencement of the Order, it does not apply to the Proposal. Notwithstanding, Transport for NSW will consider its position with regard to extending standard construction hours consistent with the intention of the Order through the Determination and/or post-approvals process. In the event that Transport for NSW would seek to extend the standard construction hours, the potential environmental impacts of doing so would be further assessed as part of the Determination and/or post approvals process.

3.3.5 Earthworks

Excavations and earthworks would generally be required for the following:

- removal and cut of the existing at-grade car park
- 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.

3.3.6 Source and quantity of materials

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

3.3.7 Traffic access and vehicle movements

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

- temporary displacement of existing commuter car parking at the Proposal site during construction which would be offset by temporary parking provided under a separate approval
- temporary changes in pedestrian, cyclist and vehicle access and movements
- potential temporary road closures during proposed road work
- potential delays to bus services.

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

A temporary construction compound 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 as shown in Figure 11. The site offices and construction laydown and storage area would be located near the western boundary of the site and worker facilities such as toilets and lunch areas would be installed north of the site boundary.

![Figure 11 Site establishment plan outlining temporary site facilities (subject to contractor requirements)](image)

3.3.9 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 (Endeavour Energy)
- telecommunications
- stormwater drainage (Council)

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

Transport for NSW does not propose to acquire any property as part of the Proposal. The proposed car park site is wholly located on land owned by Transport for NSW.

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

<table>
<thead>
<tr>
<th>Applicable legislation</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Aboriginal and Torres Strait Islander Heritage Protection Act 1984</em></td>
<td>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.</td>
</tr>
<tr>
<td><em>Disability Discrimination Act 1992</em></td>
<td>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. Accessible parking spaces would be provided on the ground floor as part of the Proposal. The proposed car park would have lift access.</td>
</tr>
</tbody>
</table>
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 matter that promotes certain common objectives, including to promote the delivery of transport services in an environmentally sustainable manner.

This REF has been prepared having regard to, 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.

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

4.2.3 Other NSW legislation and regulations

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

<table>
<thead>
<tr>
<th>Applicable legislation</th>
<th>Considerations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aboriginal Land Rights Act 1983</td>
<td>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.</td>
</tr>
<tr>
<td>Biodiversity Conservation Act 2016 (BC Act)</td>
<td>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&amp;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 6.5).</td>
</tr>
<tr>
<td>Biosecurity Act 2015</td>
<td>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 6.5).</td>
</tr>
<tr>
<td>Contaminated Land Management Act 1997 (CLM Act)</td>
<td>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 6.7).</td>
</tr>
<tr>
<td>Heritage Act 1977 (Heritage Act)</td>
<td>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 6.12).</td>
</tr>
<tr>
<td>Land Acquisition (Just Terms Compensation) Act 1991</td>
<td>Property acquisition would need to be managed in accordance with the Land Acquisition (Just Terms Compensation) Act 1991.</td>
</tr>
<tr>
<td>Applicable legislation</td>
<td>Considerations</td>
</tr>
<tr>
<td>------------------------------------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| **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. |
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. |
| **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 Henderson Road adjacent to the north of the Proposal site. 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.                                                                                                                                                                                                                                                                         |
| **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 (Infrastructure) 2007**

The Infrastructure SEPP is the key environmental planning instrument which determines the permissibility of a Proposal and under which part of the EP&A Act an activity or development may be assessed.
Clause 79 in Division 15 of the 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 Clause 78 includes ‘associated public transport facilities for railway stations’ which is further defined in Clause 5 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.

Division 1 of the 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 Infrastructure SEPP.

Clause 8 of the Infrastructure SEPP identifies that the Infrastructure SEPP prevails over all other environmental planning instruments, except where there is an inconsistency with State Environmental Planning Policy (State Significant Precincts) 2005 or certain provisions of State Environmental Planning Policy (Coastal Management) 2018.

Relevantly, the Proposal also falls within an area regulated by the State Environmental Planning Policy (State Significant Precincts) 2005 (State Significant Precincts SEPP). However, the continued operation of the Infrastructure SEPP to the Proposal is provided for by clause 35 in Appendix 16 of the State Significant Precincts SEPP, notwithstanding clause 8(2)(b) of the Infrastructure SEPP. Further discussion regarding the application of the State Significant Precincts SEPP is provided below.

State Environmental Planning Policy (State Significant Precincts) 2005

The State Significant Precincts 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 16 of the SEPP. Therefore, the planning provisions prescribed by the State Significant Precincts 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 State Significant Precincts SEPP as B4 Mixed Use. Clause 10, Appendix 16 of the State Significant Precincts 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 State Significant Precincts 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 only with consent.

Similarly, demolition activities required for the removal of the existing at-grade car park including demolition of the staff facilities and accessible toilet block would require development consent by virtue of Clause 23, Appendix 16 of the State Significant Precincts SEPP.

However, clause 35(1) in Appendix 16 of the State Significant Precincts 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 (Infrastructure) 2007.”

Accordingly, permissibility of the Proposal remains under the application of the 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 State Significant Precincts 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 State Significant Precincts SEPP (Part 31 of Schedule 1)

<table>
<thead>
<tr>
<th>Provision description</th>
<th>Relevance to the Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clause 18 - Height of buildings</td>
<td>The height of the building would be approximately 17 metres and would not exceed the maximum height of 24 metres.</td>
</tr>
<tr>
<td>Clause 19 – Floor Space Ratio</td>
<td>The Proposal would exceed the floor space ratio of 2.5:1.</td>
</tr>
<tr>
<td>Clause 31 – Preservation of trees</td>
<td>Vegetation at the Proposal site would be cleared and offset in accordance with the Transport for NSW Vegetation Offset Guide.</td>
</tr>
</tbody>
</table>
State Environmental Planning Policy (Koala Habitat Protection) 2019

Koala Habitat Protection (SEPP) aims to encourage the proper conservation and management of natural vegetation areas that provide habitat for koalas to ensure that permanent, free living areas are maintained over their present range. The policy applies to the Proposal study area. However, as the Proposal is to be assessed under Division 5.1 of the EP&A Act, SEPP does not formally apply but the impacts to biodiversity have been considered in the preparation of this REF (refer to Section 6.5). There is no approved Koala Management Plan prepared in accordance with the SEPP which applies 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 6.7 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 6.8.
4.3 Ecologically sustainable development

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

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

The principles of ESD have been adopted by Transport for NSW throughout the development and assessment of the Edmondson Park Station (South) 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 been consulting with key stakeholders on the design option. Transport for NSW has had ongoing consultation with Liverpool City Council (including meetings held on 26 September 2019 and 21 January 2020) and adjacent landowners since mid-2019.

5.2 Consultation requirements under the Infrastructure SEPP

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

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

<table>
<thead>
<tr>
<th>Clause</th>
<th>Clause particulars</th>
<th>Relevance to the Proposal</th>
</tr>
</thead>
</table>
| Clause 13 | Consultation with Councils – development with impacts on council related infrastructure and services | Consultation is required where the Proposal would result in:  
- substantial impact on stormwater management services  
- generating traffic that would place a local road system under strain  
- involve connection to or impact on a council owned sewerage system  
- involve connection to and substantial use of council owned water supply  
- significantly disrupt pedestrian or vehicle movement  
- involve significant excavation to a road surface or footpath for which Council has responsibility. | The Proposal includes work that would:  
- require connections or impacts upon the stormwater system (minor)  
- 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. |
| Clause 14 | 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 6.12. |
| Clause 15 | Consultation with Councils – development with impact on land that is susceptible to flooding – reference would be | 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 |
<table>
<thead>
<tr>
<th>Clause</th>
<th>Clause particulars</th>
<th>Relevance to the Proposal</th>
</tr>
</thead>
<tbody>
<tr>
<td>impacts on flood liable land</td>
<td>made to Floodplain Development Manual: the management of flood liable land.</td>
<td>with Council is not required in regard to this aspect.</td>
</tr>
<tr>
<td>Clause 15A</td>
<td>Consultation with Councils – development with impacts on certain land within the coastal zone</td>
<td>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.</td>
</tr>
<tr>
<td>Clause 15AA</td>
<td>Consultation with State Emergency Service – development with impacts on flood liable land</td>
<td>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.</td>
</tr>
<tr>
<td>Clause 16</td>
<td>Consultation with public authorities other than Councils</td>
<td>For specified development which includes consultation with the 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 Infrastructure SEPP where relevant.</td>
</tr>
<tr>
<td>Clause 104</td>
<td>Consultation with Relevant roads authority</td>
<td>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.</td>
</tr>
</tbody>
</table>

### 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 Thursday 26 March 2020 and Friday 10 April 2020.

In response to the evolving Coronavirus 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 Coronavirus, including:

- targeted consultation with local businesses, schools, aged care facilities and other community groups through phone calls and emails
- a community notification distributed to local residents and businesses via letterbox drop and made available to rail customers at the station to inform the community about the Proposal
- installation of project signage at the station and in the existing commuter car parks
- consultation with key stakeholders such as Liverpool City Council, Sydney Trains, and adjacent land holders
- geographically targeted social media advertising via Facebook to inform the community of the Proposal and invite their feedback online
development of a dedicated web page and online feedback form for the project on the Transport for NSW website which can be found at www.transport.nsw.gov.au/edmondsonpark

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**

<table>
<thead>
<tr>
<th>Key themes of feedback</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Support for the project and requests to proceed as quickly as possible</td>
<td>Improving commuter parking at Edmondson Park Station is a priority for Transport for NSW. Construction of the multi-storey car park is planned to begin mid-2020 and is expected to be complete mid-2021.</td>
</tr>
<tr>
<td>Key themes of feedback</td>
<td>Response</td>
</tr>
<tr>
<td>------------------------</td>
<td>----------</td>
</tr>
</tbody>
</table>
| Concern that 1,000 spaces will not cater for current or future demand and queries around when the 2,000 spaces announced by the NSW Government will be delivered. | 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, 2,000 spaces have been announced. 
Liverpool LGA is one of the fastest growing regions in Sydney. Experiencing substantial growth from urban release 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 proposed 2,000 spaces are designed to accommodate existing, and anticipated growth in customer parking demand. 
The first step in delivering 2,000 spaces is a multi-storey car park that will provide up to 1,000 additional spaces to the south of Edmondson Park Station as assessed in this REF. 
The proposed Edmondson Park (South) car park would be built using a flexible and adaptable design that would allow for future opportunities to increase capacity if required. 
The capacity has been designed to accommodate existing and anticipated growth in customer parking demand while taking into consideration the broader vision for transport across Greater Sydney. 
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. 
Planning is underway for new rail, road and freight connections to support the booming region, including connections to the new Western Sydney Airport at Badgerys Creek as outlined in Section 2.2 of this REF. 
Improvements to several bus services are on the way for the south west from mid-2020, including additional services on routes 859 and 869 serving Edmondson Park. 
Transport for NSW will continue to work with key stakeholders to finalise the plans for the remaining car parking spaces and more information will be shared with the community soon. 
Transport for NSW is also committed to improving commuter parking at neighbouring Leppington Station, with up to 1,000 additional spaces on the way. 
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 provide customers with more choice in how they travel. |
<table>
<thead>
<tr>
<th>Key themes of feedback</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>More information around the temporary offset parking and requests to make this open</td>
<td>The existing car park on the southern side of the station will no longer be available when construction of the new multi-storey commuter car park begins.</td>
</tr>
<tr>
<td>to the public before construction of the new facility begins.</td>
<td>Temporary parking will be available for the community to offset the removal of parking spaces during the construction.</td>
</tr>
<tr>
<td></td>
<td>The temporary parking will be completed and opened to the community before construction of the new multi-storey car park begins.</td>
</tr>
<tr>
<td></td>
<td>Transport for NSW is working with key stakeholders to finalise arrangements for the temporary parking and more information will be provided to the community shortly.</td>
</tr>
<tr>
<td></td>
<td>The existing northern at-grade car park will remain open during construction.</td>
</tr>
<tr>
<td>Information around why the proposed location of the multi-storey car park was selected</td>
<td>The car park location was identified following a selection process which 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.</td>
</tr>
<tr>
<td>and how it will complement the town centre.</td>
<td>The proposed location is considered the best outcome to meet the needs of both of these groups.</td>
</tr>
<tr>
<td></td>
<td>It is within easy walking distance from the station for convenient access to public transport and increases commuter connectivity to the town centre for access to shopping, dining and entertainment facilities.</td>
</tr>
<tr>
<td></td>
<td>It also provides future opportunities to complement and integrate with the town centre as it develops. The car park would be designed in a flexible and adaptable way that enables future activation of the ground floors with uses other than parking (e.g. community or retail uses), should transport needs change.</td>
</tr>
<tr>
<td></td>
<td>The car park would be designed using urban design principles to complement the character of the area including aesthetics and streetscapes.</td>
</tr>
<tr>
<td></td>
<td>Visual elements, such as quality façade treatments and landscaping, would be key factors considered as part of the detailed design process which would be undertaken in consultation with key stakeholders.</td>
</tr>
<tr>
<td>More information about Transport Park&amp;Ride and concerns that residents may park in</td>
<td>The concept design for the multi-storey car park includes ‘Transport Park&amp;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.</td>
</tr>
<tr>
<td>the car park for long periods, taking spaces away from commuters</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>The existing northern at-grade car park would remain free and untimed as it is now.</td>
</tr>
</tbody>
</table>
## Key themes of feedback

<table>
<thead>
<tr>
<th>Concerns regarding increased congestion in and around the station precinct</th>
<th>During the detailed design process, modifications to the local road network would be considered to improve traffic flow in and around the station precinct and town centre, and provide motorists with multiple options for accessing the station and car park. More information about proposed road improvements are outlined in the Traffic, Transport and Access Impact Assessment (FutureRail, 2020) which found that all critical intersections would operate at satisfactory levels of service when the car park is open and operational.</th>
</tr>
</thead>
</table>

Other requests received include:

- parking spaces be reserved for mid-morning travellers
- more kiss & ride options / the relocation of current kiss & ride drop off point
- secure bicycle, motorcycle and scooter parking
- an undercover walkway between the car park and the station entry
- a pedestrian overpass between the car park and the station entry
- underground parking
- more accessible parking spaces
- parents with prams parking spaces
- ensuring parking spaces are wide enough for larger cars
- toilets in the car park
- security cameras in the car park
- ways of deterring vandals.

The Proposal includes CCTV cameras for safety and security and approximately 26 additional accessible car parking spaces within the multi-storey car park. The other requests received will be considered as part of the detailed design process of the car park.

During the consultation period, Transport for NSW received further feedback about the need to improve transport connections more broadly to support this growing part of Sydney. The community provided suggestions such as increased bus and train services, additional railway stations, active transport links and upgrades to footpaths and roads surrounding the station.

We are working with a range of teams within Transport for NSW and with Liverpool City Council to assess and consider these suggestions.
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 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 clause 228 of the EP&A Regulation. A checklist of clause 228 factors and how they have been specifically addressed in this REF is included at Appendix B.

6.1 Traffic and transport

A Traffic, Transport and Access Impact Assessment (TTAIA), which assessed the existing environment and impacts of the Proposal on the surrounding road, pedestrian and public transport network was prepared by FutureRail in May 2020.

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 on an existing at-grade commuter car park fronting onto Henderson Road with the nearest intersection being to the east with Soldiers Parade.

Edmondson Park Station and interchange facilities

Edmondson Park Station is located on the western side of Soldiers Parade and is mostly isolated from residential and employment land uses, although several residential, retail and commercial development sites are under construction to the south of the station. 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. The kiss and ride facilities are insufficient which results in queuing in the road near the station. The kiss and ride area is also regularly occupied by illegally parked commuter vehicles due to the insufficient availability of commuter car parking. 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 and western 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 531 commuter car parking spaces including:

- north commuter car park: 195 spaces
- south commuter car park (where the Proposal site is located): 216 spaces
- on-street parking: 120 spaces.

The current commuter car parking facilities are not meeting demand, which has led to parking overspill into adjacent roads and illegal parking practices within the precinct. The commuter car parks are typically full by 8.00 am.

Pedestrian
Pedestrian access to the existing commuter car parks is provided via shared footpaths to the north and south of the station along Henderson Road and the northern car park access road. Raised pedestrian crossings are located across these roads, providing a link between the car parks and the station entrances. These raised pedestrian crossings have been observed to cause traffic congestion within the precinct.

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. The overall pedestrian connectivity to Edmondson Park Station is poor while the surrounding area continues to be developed. Pedestrian infrastructure has been established in the immediate vicinity of the Proposal site. As the area is developed, it is considered that pedestrian connectivity to the station will be improved.

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 includes 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.

Figure 14 Road access network

**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 Cowpasture Road to the south. It is the main road access to the station precinct and is located immediately to the east of the station. It provides one traffic lane in each direction and has several turning lanes for access to and from the station. Near the station and approaching the State Road network it widens to dual carriageway.

**Campbelltown Road**

Campbelltown Road is an east-west State Road link located at the southern end of Soldiers Parade. Campbelltown Road is currently undergoing a major upgrade. Stage 1 of this upgrade, between East Town Centre Road and the newly realigned MacDonald Road, is due for completion in 2020.

**Camden Valley Way**

Camden Valley Way is an east-west State Road link 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 south station access road between Edmondson Park Station and the Proposal site. Henderson Road connects to Bernera Road, the north station access road and
Soldiers Parade. An unnamed road extending south in the middle of Henderson Road provides access to the existing commuter car park on the Proposal site.

**Bernera Road**

Bernera Road connects to Henderson Road west of the Proposal site. There is currently restricted access to Bernera Road from the intersection with Henderson Road due to construction of the Edmondson Park South Town Centre.

**Buchan Road**

The proposed Buchan Road extension north of the station has development approval. The road would connect to Soldiers Parade. The road is anticipated to be completed by mid-2021.

**MacDonald Road**

As part of the development of Edmondson Park south, and extension of Bernera Road to connect to Buchan Road and Soldiers Parade north of the station is planned. This road is currently referred to as MacDonald Road.

**Unnamed road**

A temporary road has been approved by the Sydney Western City Planning Panel directly south of the Proposal site. The road would connect Bernera Road to underground retail parking for the town centre. It is intended the temporary road would be replaced when the surrounding area to the south is developed and a permanent entry with signalised intersection at Bernera Road would be established (Ethos Urban et al 2017).

**Intersection performance**

Performance of intersections near the Proposal site were assessed as shown in Table 10 regarding the following factors:

- 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 requires a minimum of LoS D.
- Average vehicle delay - The delay experienced by a vehicle crossing a signalised intersection.

**Table 10 Existing intersection performance**

<table>
<thead>
<tr>
<th>Intersection</th>
<th>Morning Average delay (sec)</th>
<th>Morning LoS</th>
<th>Morning DoS</th>
<th>Evening Average delay (sec)</th>
<th>Evening LoS</th>
<th>Evening DoS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buchan Avenue &amp; Soldiers Parade (Give-way)</td>
<td>8.4</td>
<td>A</td>
<td>0.52</td>
<td>12.6</td>
<td>A</td>
<td>0.73</td>
</tr>
<tr>
<td>Soldiers Parade &amp; Henderson Road (Signals)</td>
<td>37.3</td>
<td>C</td>
<td>0.79</td>
<td>44.8</td>
<td>D</td>
<td>0.78</td>
</tr>
<tr>
<td>Intersection</td>
<td>Morning Average delay (sec)</td>
<td>Morning LoS</td>
<td>Morning DoS</td>
<td>Evening Average delay (sec)</td>
<td>Evening LoS</td>
<td>Evening DoS</td>
</tr>
<tr>
<td>--------------</td>
<td>-----------------------------</td>
<td>-------------</td>
<td>-------------</td>
<td>----------------------------</td>
<td>-------------</td>
<td>-------------</td>
</tr>
<tr>
<td>Soldiers Parade &amp; Campbelltown Road (Signals)</td>
<td>42.4</td>
<td>C</td>
<td>0.84</td>
<td>38.2</td>
<td>C</td>
<td>0.82</td>
</tr>
</tbody>
</table>

### 6.1.2 Potential impacts

#### Construction phase

**Access**

Pedestrian and cyclist access to the site would be maintained during construction. The Proposal is unlikely to impact on kiss and ride or taxi rank operations as they are located north of the station remote from the site.

**Parking**

All 216 existing car parking spaces located on the Proposal site would be lost during construction. To offset this impact, a temporary at-grade car park would 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 as high as 21 car parking spaces. This peak impact would be during construction of the car park structure which would be approximately a 20 week period.

To offset the impact from the loss of the existing commuter car parking spaces, a temporary at-grade car parking facility would be established prior to commencement of construction of the multi-storey car park, under a separate planning approval. Separate arrangements for construction worker parking would be investigated so that there is sufficient parking capacity for the community.

**Road Network**

Construction traffic would access the Proposal site via the signals at the intersection of Henderson Road and Soldiers Parade. Deliveries to and from the site would peak at 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 likely to impact bus layover facilities on the southern side of Henderson Road during construction. The bus interchange on Henderson Road would be impacted further as up to 60 trucks per day would pass through this area during the concrete pours. An alternative bus layover location would be investigated prior to construction and in consultation with relevant stakeholders to minimise impacts to bus services.
Operation phase

Parking

The Proposal would increase commuter car parking capacity at the station by approximately 1,000 spaces (100 percent). Up to 26 spaces in the proposed car park would be accessible parking 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 the 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.

Consideration is also being given to providing electric vehicle charging stations, which would encourage more sustainable electric private vehicles.

Access to the proposed car park

Access to and from the proposed car park is proposed to be primarily via Soldiers Parade, Buchan Avenue (expected to be completed mid 2021) and Bernera Road (refer to Figure 15). The planned intersection of Soldiers Parade and Buchan Avenue does not include a southbound right turn from Soldiers Parade, or an eastbound right turn from Buchan Avenue. These movements are restricted by a central median.

As the Edmondson Park Town Centre road network is currently being planned and constructed, there are opportunities to further modify planned precinct access arrangements to improve bus priority and pedestrian connectivity outside the station entrances. A proposed improvement is introducing mid-block closures on Henderson Road (buses excepted) and the northern station access road so some of the Buchan Avenue and Henderson Road vehicle movements could then be transferred onto the planned MacDonald Road extension.
Figure 15 Predicted traffic access to the Proposal.

**Traffic generation**

It is predicted the Proposal would generate approximately:

- 536 inbound trips during the morning peak hour
- 447 outbound trips during the evening peak hour.

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 three entry and two exit boom gates. Assessment of nearby intersection performance with the additional traffic generated by the new car park were considered regarding DoS, LoS and average vehicle delay. 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 higher as outlined in Table 11.
Table 11 Existing and operational intersection performance

<table>
<thead>
<tr>
<th>Intersection Description</th>
<th>Proposal scenario</th>
<th>Morning Average delay (sec)</th>
<th>Morning LoS</th>
<th>Morning DoS</th>
<th>Evening Average delay (sec)</th>
<th>Evening LoS</th>
<th>Evening DoS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buchan Avenue &amp; Soldiers Parade (Give-way)</td>
<td>Without</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>With</td>
<td>8.4</td>
<td>A</td>
<td>0.52</td>
<td>12.6</td>
<td>A</td>
<td>0.73</td>
</tr>
<tr>
<td>Soldiers Parade &amp; Henderson Road (Signals)</td>
<td>Without</td>
<td>21.8</td>
<td>B</td>
<td>0.62</td>
<td>21.8</td>
<td>B</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>With</td>
<td>37.3</td>
<td>C</td>
<td>0.79</td>
<td>44.8</td>
<td>D</td>
<td>0.78</td>
</tr>
<tr>
<td>Soldiers Parade &amp; Campbelltown Road (Signals)</td>
<td>Without</td>
<td>39.6</td>
<td>C</td>
<td>0.8</td>
<td>36.1</td>
<td>C</td>
<td>0.89</td>
</tr>
<tr>
<td></td>
<td>With</td>
<td>42.4</td>
<td>C</td>
<td>0.84</td>
<td>38.2</td>
<td>C</td>
<td>0.82</td>
</tr>
</tbody>
</table>

6.1.3 Mitigation measures

A Construction Traffic and Pedestrian Management Plan (CTPMP) 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 TTAIA.

During detailed design consideration would be given to the following:

- potential closure of Henderson Road midblock to all traffic except buses and potential closure of Northern Access Road midblock to improve pedestrian connectivity with northern station entrance
- modification of the approved intersection design for Buchan Avenue and Soldiers Parade to include a southbound right turn into Buchan Avenue.

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, 2020). The findings of this assessment are summarised in this section.

6.2.1 Existing environment

A site visit was carried out on 17 December 2019 to gain an understanding of the existing visual environment within the Proposal site and surrounds.
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

The Proposal site is located adjacent Edmondson Park Station, the associated railway corridor and existing commuter car park. The station is a contemporary new structure that opens to a broad plaza on the eastern side and includes at-grade pedestrian and cyclist access to each side of the station. The land to the south and east of the Proposal site is undergoing construction for the development of high density residential and commercial/retail premises (see Figure 16 below). The existing sensitivity of the Proposal site is moderate as it is within the future town centre and close to the station, so the number of future public viewers would be high.

Figure 16 View of Proposal site (at-grade car park) looking east towards developing town centre

Planned Landscape character

As described in Section 1.3, an approved concept plan to develop the area around Edmondson Park Station applies to the Proposal site. Plans are for a mixed use residential, commercial and retail development, with a yield of 3,200 dwellings and up to 45,000 square metres of retail/commercial floor space within the new Edmondson Park Town Centre. Plans also include a Regional Parkland of approximately 150 hectares.

For the central, mixed use town centre zone a maximum building height of 24 metres applies. Design principles and key requirements for Edmondson Park Town Centre are detailed in Edmondson Park South Development Control Plan (DCP) 2012 (Department of Planning and Infrastructure, 2012).
**Visual receivers**

**Existing viewpoints**

The Proposal site is located within a generally flat landform and views from further afield are limited due to:

- existing high-rise residential and commercial buildings under construction in the town centre located immediately to the east
- the dense bushland within the Regional Park to the west of the Proposal site, which prevents any views from further west.
- the railway corridor and Edmondson Park Station buildings to the north, which separate the Proposal site from the existing at-grade northern commuter car park (which includes tree planting) and trees further north, limiting views from the north to mostly areas along Soldiers Parade.

The nearest sensitive viewpoints are within the planned Edmondson Park Town Centre, including around the station, the surrounding developing mixed use area (which includes residential) and from some parts of Soldiers Parade as shown in Figure 17. Views of the Proposal would be limited outside of the area surrounding the station.
Figure 17 Approximate visibility of the Proposal and assessed viewpoints
Future viewpoints

Due to the planned land use and current approved maximum building heights surrounding the Proposal site, the Proposal would have limited visibility in the future. Views would be limited by proposed developments including mixed use buildings to the north and south of Edmondson Park Station.

6.2.2 Potential impacts

Construction phase

Temporary works associated with construction of the car park would include the use of plant and equipment, establishment and operation of a site compound, removal of vegetation and stockpiling of materials. These changes would be temporary and therefore would not have a long term visual impact on the existing or future landscape character. The surrounding area has multiple construction sites associated and adjacent the planned town centre and thus would have a low impact. Residents within the residential apartments being constructed to the east of the Proposal site may have a temporary view of the construction site dependent on the timing of each project.

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 approximate 17 metre height of the Proposal is within the planned maximum building heights for the town centre of 24 metres and consistent with the future (urban) landscape character.

The viewpoints have been assessed in accordance with the NSW Roads and Maritime Services’ Guideline for Landscape Character and Visual Impact Assessment, Environmental Impact Assessment Practice Note EIA-N04 (RMS, 2018). The method to measure impact is based on the combination of sensitivity of the existing view to change, and magnitude of change the Proposal would have on that area or view. Sensitivity refers to the qualities of an area, the number and type of receivers and how sensitive the existing character of the setting is to the proposed nature of change. Magnitude refers to the physical scale of a project, how distant it is and the contrast it presents to the existing condition. The findings of the assessment for each viewpoint are shown in Table 12.
<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Description</th>
<th>Visual sensitivity</th>
<th>Magnitude of change</th>
<th>Visual Impact</th>
<th>Overall impact</th>
</tr>
</thead>
</table>
| VP1 - Southern side of station plaza     | The existing view toward the Proposal site is of the at-grade car park which would be replaced with the proposed multi-storey car park. On the western side are the future buildings of up to 24 metres high (under construction). The Proposal site is within the future town centre and close to the station, so the number of future public viewers would be high. | Moderate           | Moderate            | • the Proposal would be a recognisable new tall structure, relatively close and clearly seen.  
• the Proposal would be approximately 7m lower than the mixed-use buildings on the immediate north, and therefore would be similar in terms of height and scale.  
• existing trees within the at-grade car park would be removed | Moderate         |
| VP2 - Public viewing location from Soldiers Parade | The Proposal site is not visible as it is located behind Edmondson Park Station building. Soldiers Parade is the main road in this area and provides the primary access to the future town centre and Edmondson Park Station. | Low                | Low                 | • very little of the Proposal would be seen, with a small area of the upper level possibly visible in the background above the Edmondson Park Station building | Low            |
| VP3 – Future development to the south    | Potential viewers are future residents of the north facing apartments of the future development. The area is zoned for building heights up to 24 metres. It has been presumed future residents would be aware of the Proposal to replace the existing at-grade car park with a multi-storey structure. | Moderate           | Moderate            | • the Proposal would be a recognisable new tall structure (consistent with planned building heights for the town centre), relatively close and clearly seen from the elevated future apartments along the northern side of the viewpoint.  
• there would be a loss of potential distant views to the north (over the railway corridor and future residential areas).  
• it is predicted that residents living within apartments located on the upper two storeys on the northern side of the future apartment buildings would see over the new car park yet have views of the roof-top parking in the foreground. Residents living in apartments on lower floors (northern side) would see the car park façade in close proximity. | Moderate        |
<table>
<thead>
<tr>
<th>Viewpoint</th>
<th>Description</th>
<th>Visual sensitivity</th>
<th>Magnitude of change</th>
<th>Visual Impact</th>
<th>Overall impact</th>
</tr>
</thead>
</table>
| VP4 – Under construction development to the east | The existing view is of the landscaped, at-grade car park. The bushland of the Regional Park is seen behind (west) of that car park. Potential viewers are future residents of the western side apartments. It has been presumed that some future residents may have purchased apartments ‘off the plan’ and be unaware of this Proposal to replace the existing at-grade car park. Other future residents may be aware of the Proposal. | Moderate | Moderate | • the Proposal would be a recognisable new tall structure (consistent with planned building heights), relatively close and clearly seen from future apartments on the western side.  
• it is estimated that the upper two storeys of the future western apartments would be able to see over the new car park yet have views of the roof-top parking in the foreground. Those further below would see the car park façade in close proximity. | Moderate |
| VP5 - from Soldiers Parade to the north of Croatia Avenue | This viewpoint is from Soldiers Parade to the north of Croatia Avenue. When travelling south along Soldiers Parade there are currently views towards some of the future mixed-use buildings in the town centre currently under construction. In the existing view the at-grade car park (which would be replaced) cannot be seen. | Low | Low | • the upper part of the car park would be visible above the trees within the existing at-grade car park north of the station  
• once development occurs within the currently vacant Proposal site (in the foreground) the Proposal would be screened from view.  
• construction activities would largely not be seen from this viewpoint, apart from tall cranes. | Low |
A photomontage has been prepared to illustrate the Proposal following construction as shown in Figure 18. The photomontage is from viewpoint 1 on the southern side of Edmondson Park Station.

Figure 18 Photomontage of Proposal looking west from the station (indicative only and subject to detailed design).

Future residents of apartments adjacent to the Proposal site would have existing potential views interrupted by the Proposal. There would be a loss of potential distant views to the north (over the railway corridor and future residential areas) and west across the Regional Park for residents within the planned residential apartments to the south and east of the proposed car park.

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 relevant 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**

As the proposed car park is a tall structure in a planned town centre, overshadowing of surrounding land was considered. A solar access study was completed for the Proposal by FutureRail. As shown in Figure 19 overshadowing from the car park would occur to the east, south and west of the structure with the biggest reduction to solar hours experienced on land immediately to the south of the structure.
There is no specific guideline for solar access in the construction of car parks, so general reference has been made to the *Apartment Design Guide* (DPE, 2015) due to the current and planned residential development to the south and east of the Proposal and the wider precinct. The *Apartment Design Guide* includes a recommendation for setbacks of nine metres (between non-habitable rooms) and 12 metres (between habitable and non-habitable rooms) for five to eight storey buildings.

Indicative setbacks of nine metres and 12 metres from the southern car park façade to potential future development are shown in Figure 19. The solar access study shows that the ground and potentially first floor of any development to the south with these setbacks would be overshadowed for most of the day on the winter solstice but the impact above the first floor would be minimal. The existing development under construction to the east of the Proposal site would likely have over four hours of solar access during the winter solstice which is considered a ‘good’ level of solar access based on the *Apartment Design Guide* (DPE, 2015).

A temporary road has been approved by the Sydney Western City Planning Panel directly south of the Proposal site (DA-767/2017). The road would connect Bernera Road to underground retail parking for the town centre. It is intended that the temporary road would be replaced with a permanent road when the land to the south is developed. The dimensions of the road are not provided in the development application (Ethos Urban et al, 2017). However, should a two lane road be established, it would likely be a minimum of seven to eight metres wide based on the specifications in the *Austroads - Guide to Road Design* (Austroads, 2016), not including any potential pedestrian footpaths.

The façade of the Proposal is set back around three metres from the property boundary shared with the road approved under DA-767/2017. The construction of the road would provide additional separation between the proposed car park and any future development to the south. It is noted that the concept plan for the Edmondson Park town centre identifies that land to the south of the Proposal is planned to be mixed-use development, which typically...
comprises retail uses on the ground floor. It is therefore anticipated that solar access impacts on any future development to the south would be minor.

6.2.3 Mitigation measures

An Urban Design Plan would be prepared for the Proposal and submitted to Transport for NSW. The Urban Design Plan is to address the fundamental design principles as outlined in the Transport for NSW Urban Design Guidelines, Transport for NSW, Interim 2016. The Urban Design Plan shall:

- demonstrate a robust understanding of the Proposal 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
- a Public Domain Plan including landscape design approach and materials schedule
- demonstrate how the preferred design option responds to the design principles established in the Transport for NSW urban design guidelines.

The Urban Design Plan would be prepared in consultation with key stakeholders and 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 a sustainable design outcomes
- enhance the public realm
- allow for future growth.

6.3 Noise and vibration

A Noise and Vibration Impact Assessment (NVIA) report by Muller Acoustic Consulting was prepared in May 2020, with results summarised below.

6.3.1 Existing environment

The area around the Proposal site is predominantly made up of greenfield areas, low density residential properties and future high density residential and commercial developments. The Proposal site is located on an existing at-grade commuter car park adjacent to a railway corridor. The receivers which may be sensitive to noise surrounding the Proposal site have been identified within an approximately one kilometre radius and are shown in Figure 20 and Figure 21. The type of sensitive receivers are identified as follows:

- R for residential
- FR for future residential
- AR for active recreation
- CCC for child care centre
- Ch for place of worship
- C for commercial
- SCH for school or education facility.
Figure 20 Map of Proposal site, receivers, general area of works and compounds
Figure 21 Receiver locations in close proximity to the Proposal site
To quantify existing noise levels, long-term unattended noise monitoring was undertaken at representative receiver locations near the Proposal site. The locations at which the existing noise levels were monitored, EDP1 and EDP2, as outlined in Table 13. EDP1 is representative of the receivers to the north of the station and receivers exposed to road traffic noise. Due to intensive construction works adjacent to the station, the location of EDP2 was chosen to represent receivers south of the station, being a similar offset distance to the rail corridor. The unattended noise monitoring survey was conducted in general accordance with the procedures described in Australian Standard AS 1055-2018 Acoustics - Description and Measurement of Environmental Noise.

**Table 13 Noise monitoring locations**

<table>
<thead>
<tr>
<th>Logger</th>
<th>Location</th>
<th>Coordinate (easting)</th>
<th>Coordinate (northing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDP1</td>
<td>Croatia Avenue, Edmondson Park</td>
<td>302357</td>
<td>6239519</td>
</tr>
<tr>
<td>EDP2</td>
<td>Lowe Avenue, Bardia</td>
<td>303150</td>
<td>6238898</td>
</tr>
</tbody>
</table>

Rating Background Noise Levels (RBLs) are determined from the measurement of $L_{A90}$ noise levels (representing the ambient noise level exceeded for 90 per cent of the monitoring period). The RBLs, are determined based on the results of the noise monitoring. 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 14.

**Table 14 Unattended noise monitoring results**

<table>
<thead>
<tr>
<th>Monitoring Location</th>
<th>Period</th>
<th>Measured Background Noise Level ($L_{A90}$), dB</th>
<th>Measured $dB L_{Aeq}$(period)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EDP1</td>
<td>Day</td>
<td>41</td>
<td>57</td>
</tr>
<tr>
<td>EDP1</td>
<td>Evening</td>
<td>45</td>
<td>56</td>
</tr>
<tr>
<td>EDP1</td>
<td>Night</td>
<td>36</td>
<td>48</td>
</tr>
<tr>
<td>EDP2</td>
<td>Day</td>
<td>39</td>
<td>52</td>
</tr>
<tr>
<td>EDP2</td>
<td>Evening</td>
<td>43</td>
<td>58</td>
</tr>
<tr>
<td>EDP2</td>
<td>Night</td>
<td>37</td>
<td>52</td>
</tr>
</tbody>
</table>

Existing road traffic noise levels measured at unattended noise monitoring location EDP1 are presented in Table 15. The closest existing residential receivers to the Proposal site, R05 and R06, are apartment blocks/townhouses on the southern side of the rail corridor on Soldiers Parade located approximately 15 metres and 65 metres respectively from the road centreline. Receiver R06 is also shielded by the receiver R05 structure. For these receivers, the road traffic noise levels (measured at EDP1) have been adjusted to account for offset distance and façade reflection.

**Table 15 Measured road traffic noise levels at EDP1**

<table>
<thead>
<tr>
<th>Receiver</th>
<th>Period</th>
<th>Measured Existing Road Traffic Noise Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>R05</td>
<td>Day</td>
<td>65.8dB $L_{Aeq}$ (15 hour)</td>
</tr>
</tbody>
</table>
### 6.3.2 Potential impacts

#### Construction phase

**Construction noise**

The assessment includes identification of potentially affected assessment locations, description of activities involved in the Proposal, derivation of the construction noise criteria for standard construction working hours and Out of Hours (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, 2000). 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 16.

#### Table 16 ICNG recommended NMLs

<table>
<thead>
<tr>
<th>Provision description</th>
<th>NML (L&lt;sub&gt;Aeq 15 minutes&lt;/sub&gt;)</th>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recommended standard hours: Monday to Friday 7.00am to 6.00pm Saturday 8.00am to 1.00pm No work on Sunday or Public Holidays</td>
<td>Noise affected RBL + 10dBA</td>
<td>The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured L&lt;sub&gt;Aeq,15min&lt;/sub&gt; is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.</td>
</tr>
</tbody>
</table>
Provision description | NML (LA_{eq} 15 minutes) | Application
---|---|---
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 proponent should consider very carefully if there is any other feasible and reasonable way to reduce noise to below this level. If no quieter work method is feasible and reasonable, and the works proceed, the proponent should communicate with the impacted residents by clearly explaining the duration and noise level of the works, and by describing any respite periods that would be provided.

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.

NMLs for construction activities have been developed for receivers during standard construction hours and out of hours periods and are summarised in Table 17. OOH periods are divided into two categories:

- Period 1 (evening/low risk period):
  - Monday to Friday – 6.00pm to 10.00pm,
  - Saturdays – 1.00pm to 6.00pm
  - Sundays and Public Holidays – 8.00am to 6.00pm

- Period 2 (night/medium to high risk period):
  - Monday to Friday – 10.00pm to 7.00am
  - Saturdays, Sundays and Public Holidays – 6.00pm to 7.00am (8.00am on Sunday mornings and Public Holidays).

### Table 17 NMLs at surrounding receivers

<table>
<thead>
<tr>
<th>Location</th>
<th>Assessment Period</th>
<th>RBL, dBA</th>
<th>NML dB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential receivers (EDP1)</td>
<td>Day (Standard Hours)</td>
<td>41</td>
<td>51 (RBL+10dBA)</td>
</tr>
<tr>
<td>Residential receivers (EDP1)</td>
<td>Evening (OOH Period 1)</td>
<td>45</td>
<td>46 (RBL+5dBA)</td>
</tr>
<tr>
<td>Residential receivers (EDP1)</td>
<td>Night (OOH Period 2)</td>
<td>36</td>
<td>41 (RBL+5dBA)</td>
</tr>
</tbody>
</table>
A computer model was developed to predict and quantify project noise emissions to neighbouring receivers for typical construction activities and operations. The noisiest stages during construction are likely to be relocation of services, fit out of the structure and installation of the external facade. Noise emissions are predicted to be either below the NML or exceed the NML by up to 10dB for standard construction hours at all existing identified residential receivers during construction. The OOH NMLs are predicted to be exceeded by more than 5dB at the existing residential receivers during installation of the external façade and relocation of services. The highly noise affected management level (75dBA) is not predicted to be exceeded at any existing identified residential receivers. Noise emissions are predicted to exceed the NMLs by more than 10dB during standard construction hours at up to twelve potential future receivers. Noise emissions are predicted to exceed the OOH NMLs at up to 41 potential future receivers by more than 5dB. The highly noise affected management level (75dBA) is predicted to be exceeded at one potential future receiver (FR01).

The highest predicted noise levels are associated with installation of the external facade and the NMLs are expected to be exceeded as outlined in Table 18. For all other receivers the NML is not expected to be exceeded during external façade installation.

### Table 18 Predicted Noise Levels exceeding NMLs during façade installation

<table>
<thead>
<tr>
<th>Location</th>
<th>Construction Hours</th>
<th>NML dB $L_{Aeq(15min)}$</th>
<th>Predicted Noise Level dB $L_{Aeq(15min)}$</th>
<th>Number of receivers above NML</th>
</tr>
</thead>
<tbody>
<tr>
<td>Edmondson Park Town Centre</td>
<td>Standard</td>
<td>51</td>
<td>33 - 54</td>
<td>0</td>
</tr>
<tr>
<td>24 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edmondson Park Town Centre</td>
<td>Period 1</td>
<td>46</td>
<td>33 - 54</td>
<td>4</td>
</tr>
<tr>
<td>24 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Construction Hours</td>
<td>NML $\text{dB L}_{\text{Aeq}(15\text{min})}$</td>
<td>Predicted Noise Level $\text{dB L}_{\text{Aeq}(15\text{min})}$</td>
<td>Number of receivers above NML</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------------</td>
<td>-----------------------------------------------</td>
<td>---------------------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Edmondson Park Town Centre</td>
<td>Period 2</td>
<td>41</td>
<td>33 - 54</td>
<td>5</td>
</tr>
<tr>
<td>24 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bardia Centre (existing)</td>
<td>Standard</td>
<td>51</td>
<td>17 - 47</td>
<td>0</td>
</tr>
<tr>
<td>18 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bardia Centre (existing)</td>
<td>Period 1</td>
<td>46</td>
<td>17 - 47</td>
<td>4</td>
</tr>
<tr>
<td>18 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bardia Centre (existing)</td>
<td>Period 2</td>
<td>41</td>
<td>17 - 47</td>
<td>4</td>
</tr>
<tr>
<td>18 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edmondson Park North East</td>
<td>Standard</td>
<td>49</td>
<td>39 - 47</td>
<td>0</td>
</tr>
<tr>
<td>6 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edmondson Park North East</td>
<td>Period 1</td>
<td>44</td>
<td>39 - 47</td>
<td>0</td>
</tr>
<tr>
<td>6 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edmondson Park North East</td>
<td>Period 2</td>
<td>42</td>
<td>39 - 47</td>
<td>1</td>
</tr>
<tr>
<td>6 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edmondson Park North West</td>
<td>Standard</td>
<td>49</td>
<td>41 - 62</td>
<td>0</td>
</tr>
<tr>
<td>12 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edmondson Park North West</td>
<td>Period 1</td>
<td>44</td>
<td>41 - 62</td>
<td>0</td>
</tr>
<tr>
<td>12 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Edmondson Park North West</td>
<td>Period 2</td>
<td>42</td>
<td>41 - 62</td>
<td>2</td>
</tr>
<tr>
<td>12 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denham Court</td>
<td>Standard</td>
<td>49</td>
<td>40 - 50</td>
<td>0</td>
</tr>
<tr>
<td>12 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denham Court</td>
<td>Period 1</td>
<td>44</td>
<td>40 - 50</td>
<td>0</td>
</tr>
<tr>
<td>12 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Denham Court</td>
<td>Period 2</td>
<td>42</td>
<td>40 - 50</td>
<td>2</td>
</tr>
<tr>
<td>12 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bardia Centre (Future)</td>
<td>Standard</td>
<td>51</td>
<td>32 - 52</td>
<td>0</td>
</tr>
<tr>
<td>9 receivers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Location</td>
<td>Construction Hours</td>
<td>NML dBA&lt;sub&gt;L&lt;/sub&gt;&lt;sup&gt;(15min)&lt;/sup&gt;</td>
<td>Predicted Noise Level dBA&lt;sub&gt;L&lt;/sub&gt;&lt;sup&gt;(15min)&lt;/sup&gt;</td>
<td>Number of receivers above NML</td>
</tr>
<tr>
<td>----------------------------------</td>
<td>--------------------</td>
<td>-------------------------------------</td>
<td>--------------------------------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Bardia Centre (Future)</td>
<td>Period 1</td>
<td>46</td>
<td>32 - 52</td>
<td>7</td>
</tr>
<tr>
<td>Bardia Centre (Future)</td>
<td>Period 2</td>
<td>41</td>
<td>32 - 52</td>
<td>8</td>
</tr>
<tr>
<td>Edmondson Park Town Centre Future</td>
<td>Standard</td>
<td>51</td>
<td>29 - 77</td>
<td>12</td>
</tr>
<tr>
<td>Edmondson Park Town Centre Future</td>
<td>Period 1</td>
<td>46</td>
<td>29 - 77</td>
<td>32</td>
</tr>
<tr>
<td>Edmondson Park Town Centre Future</td>
<td>Period 2</td>
<td>41</td>
<td>29 - 77</td>
<td>41</td>
</tr>
</tbody>
</table>

OOH construction activities occurring during the night time have the potential to generate noise emissions that may cause sleep disturbance at existing and potential residential receivers in proximity to the construction work. 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.

The Proposal would proactively manage any noise emissions and implement reasonable and feasible noise control strategies in the event the new residential building adjacent to the Proposal site becomes occupied during construction.

Where exceedances of the NML are anticipated, a combination of mitigation, management and consultation with receivers would be implemented. To manage and minimise impacts from construction noise, measures and strategies would be included in the CEMP and implemented. Adoption of noise management strategies such as noise barriers may result in the following noise attenuation of up to 10dBA or more.

**Construction road traffic**

Construction road traffic (noise and vibration) impacts from the Proposal are not anticipated (i.e. from additional vehicles on the public road network). The proposed route via Soldiers Parade would generate approximately five to six (Proposal related) heavy vehicle movements per hour. This is considered negligible and is not expected to increase existing road traffic noise levels at receivers along the route. Furthermore, the Proposal is not expected to generate a significant increase in vehicles on the surrounding road network compared to the existing vehicle flows.

**Vibration**

The *Construction Noise and Vibration Strategy* (Transport for NSW, 2019) sets out safe working distances to achieve the human response criteria for vibration. For a large vibratory roller, the *Construction Noise and Vibration Strategy* sets a safe working distance of 100 metres to achieve the residential human response criteria for continuous vibration. The nearest existing receivers to the construction area are approximately 150 metres from the Proposal and human exposure to vibration is anticipated to be minimal. However, vibration has
the potential to exceed to maximum vibration levels at the nearest potential future receiver immediately adjacent to the Proposal should the property become occupied.

Where the human response criteria are satisfied, the structural or cosmetic criteria for sensitive receivers would be achieved. However in the event the adjacent residential building is occupied, the Proposal would manage vibration generating equipment through testing or substitution of plant. Work generating high noise and/or vibration would be scheduled during less sensitive time periods where possible.

**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 assessment calculated the noise emissions associated with car movements within the car park, including maximum noise events such as door slams engine starting.

**Car park noise**

The potential noise impacts associated with operation of the Proposal considered general operational vehicle noise (car movement and engine noise) and transient noise events (car door slams, boot slams and horn emissions).

For the assessment of operational noise, a sound power for general car usage (i.e. car movement and engine noise) of 75dB $L_{Aeq(15min)}$ was adopted. To assess the impact of transient noise events such as door or boot slams a sound power level of 85dB $L_{A_{max}}$ was adopted. Wheel squeal from vehicles manoeuvring in the proposed car park has not been assessed as the Proposal would be designed to minimise or eliminate this type of noise emission.

Predicted noise levels from the general operation of the car park are less than 35dB $L_{A_{eq}(15min)}$ at all existing identified residential receivers and potential future receivers, satisfying the minimum applicable night time *Noise Policy for Industry* (EPA, 2017) criteria of 35dB $L_{Aeq(15min)}$. Predicted maximum noise level events are less than 40dB $L_{A_{max}}$ at all existing identified residential receivers and potential future receivers, which would also satisfy the operational maximum noise trigger levels.

**Road Traffic**

The TTAIA for the Proposal (FutureRail, 2020) identifies the largest potential increases in road traffic would occur along Soldiers Parade from additional vehicles generated by the Proposal (see Section 6.1.2).

NSW *Road Noise Policy* (RNP) defines the road noise assessment criteria for developments. The assessment criteria is shown in Table 19.

**Table 19 Road traffic noise assessment criteria**

<table>
<thead>
<tr>
<th>Road category</th>
<th>Type of project/development</th>
<th>Assessment Criteria – dBA</th>
<th>Assessment Criteria – dBA</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Day (7am to 10pm)</td>
<td>Night (10pm to 7am)</td>
</tr>
<tr>
<td>Freeways/arterial/sub-arterial Roads</td>
<td>Existing residences affected by additional traffic on freeways/arterial/sub-arterial roads generated by land use developments</td>
<td>60dB $L_{Aeq(15hr)}$</td>
<td>55dB $L_{Aeq(9hr)}$</td>
</tr>
<tr>
<td>Road category</td>
<td>Type of project/development</td>
<td>Assessment Criteria – dBA Day (7am to 10pm)</td>
<td>Assessment Criteria – dBA Night (10pm to 7am)</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>Local roads</td>
<td>Existing residences affected by additional traffic on local roads generated by land use developments</td>
<td>55dB $L_{Aeq(1hr)}$</td>
<td>50dB $L_{Aeq(1hr)}$</td>
</tr>
<tr>
<td>School Classrooms</td>
<td>Proposed road projects and traffic generating developments</td>
<td>40dB $L_{Aeq(1hr)}$ (internal)</td>
<td>N/A</td>
</tr>
<tr>
<td>Places of worship</td>
<td>Proposed road projects and traffic generating developments</td>
<td>40dB $L_{Aeq(1hr)}$ (internal)</td>
<td>40dB $L_{Aeq(1hr)}$ (internal)</td>
</tr>
<tr>
<td>Child care facilities</td>
<td>Proposed road projects and traffic generating developments</td>
<td>35dB $L_{Aeq(1hr)}$ (internal)</td>
<td>35dB $L_{Aeq(1hr)}$ (internal)</td>
</tr>
<tr>
<td>Open Space (active use)</td>
<td>Proposed road projects and traffic generating developments</td>
<td>60dB $L_{Aeq(1hr)}$</td>
<td>N/A</td>
</tr>
<tr>
<td>Open Space (passive use)</td>
<td>Proposed road projects and traffic generating developments</td>
<td>55dB $L_{Aeq(1hr)}$</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Additionally, the RNP states where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to 2dB, which is generally accepted as the threshold of perceptibility to a change in noise level.

Results of the potential future traffic generated by the Proposal indicates an increase of 1dB to 7.2dB during the daytime period and 1.3dB to 7.8dB during the night time period across all identified existing residential receivers. The higher changes to the noise traffic levels occur on Vevi Street and Arthur Allen Drive, south of Campbelltown Road. Although these predicted increases are greater than 2dB, the RNP criteria as identified in Table 19 would be satisfied for the identified residential receivers.

Existing road traffic noise levels at the façade of receiver R05 on Soldiers Parade currently exceed the RNP criteria. However future road traffic noise levels are expected to increase by less than 2dB satisfying the requirements of the RNP. Therefore, the objectives of the RNP are satisfied at all identified existing residential receivers.

### 6.3.3 Mitigation measures

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

Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the ICNG (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (Transport for NSW, 2019) and the Noise and Vibration Assessment for the Proposal (Muller Acoustic Consulting, 2020). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
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 (ADDHA) 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 to 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 two sites in proximity to the Proposal site near the railway corridor. The search did not identify any Aboriginal sites within the Proposal site, and no Aboriginal places have been declared. Furthermore, the Proposal site is located in an area that has been highly modified. Previous construction of the adjacent railway corridor and the existing at-grade car park has resulted in significant disturbance to the Proposal site.

The Proposal site has 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, 2016a) would be followed, and works within the vicinity of the find would cease immediately. The Construction Contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, the EES Group and the Thurawal 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.

6.5 Biodiversity

6.5.1 Existing environment

An assessment of the Proposal site in accordance with the Transport for NSW Vegetation Offsite Guide was undertaken by Cumberland Ecology based on a desktop review of existing information and a site visit conducted on 12 March 2020.

Existing environment

The Proposal site consists of an at-grade car park including landscaped garden beds between the car park rows and along the eastern boundary comprising of young native trees and shrubs. The landscaping was established in 2015 following construction of the existing at-grade car park. A densely vegetated regional park is located directly west of the Proposal site.

Endemic native species were identified in the Proposal site such as Spotted Gum (Corymbia maculata) and Broad-leaved Paperbark (Melaleuca quinquenervia) and non-endemic native trees and shrubs such as Tuckeroo (Cupaniopsis anacardioides) and Common Hop Bush (Dodonaea triquetra). No endangered species or ecological communities were identified within the Proposal site and no hollow bearing trees or noxious weeds were identified. A photo of vegetation present in the car park is shown in Figure 22.

The habitat connectivity of the Proposal site is low as the native vegetation is confined to garden beds and is separated by a road from the regional park. The Proposal site is unlikely to provide habitat for native species such as the koala.

Figure 22 Photo of vegetation present in the Proposal site

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 (Liverpool City Council, 2020)

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.
6.5.2 Potential impacts

Construction phase

The Proposal would require removal of all vegetation within the site. As the land is biodiversity certified and contains native species planted in 2015 which are not endangered, the clearing of vegetation is considered unlikely to significantly affect threatened species or ecological communities.

The Proposal has the potential to indirectly impact surrounding vegetation and habitats, including through habitat fragmentation and edge effects. However, due to the disturbed nature of the Proposal site from existing operational use as a car park and the low habitat connectivity these impacts are unlikely to occur. Other indirect impacts include increased sedimentation and erosion and spread of weeds. The landscaping aspects of the Proposal would be determined during detailed design.

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

The vegetation assessment for the Proposal identified the offset requirements in accordance with the Vegetation Offset Guide. The number of offset trees that would need to be planted was identified using Diameter Breast Height (DBH) of the trees that are proposed to be removed as shown in Table 20.

Table 20 Tree offset findings

<table>
<thead>
<tr>
<th>Tree size</th>
<th>Number of trees</th>
<th>Offset Ratio</th>
<th>Number of offset trees required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total no. of large trees (DBH &gt; 60cm)</td>
<td>0</td>
<td>8:1</td>
<td>0</td>
</tr>
<tr>
<td>Total no. of medium trees (DBH 15-60cm)</td>
<td>14</td>
<td>4:1</td>
<td>56</td>
</tr>
<tr>
<td>Total no. of small trees (DBH &lt; 15cm)</td>
<td>71</td>
<td>2:1</td>
<td>142</td>
</tr>
<tr>
<td>Total</td>
<td>85</td>
<td>-</td>
<td>198</td>
</tr>
</tbody>
</table>

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.

6.5.3 Mitigation measures

The biodiversity impacts of the Proposal and for the surrounding land would be minimised by a range of mitigation measures as outlined in Chapter 7. Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal and 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.

Construction of the Proposal must be undertaken in accordance with Transport for NSW’s Vegetation Management (Protection and Removal) Guideline (Transport for NSW, 2018c) and Transport for NSW’s Fauna Management Guideline (Transport for NSW, 2018d).
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 around Edmondson Park Station. The area around the south of the station, where the Proposal site is located, is currently under construction to establish the mixed use town centre. The planned growth for Edmondson Park is described in Section 1.3.2.

There are a number a residential developments which have been completed in the last few years in the areas surrounding Edmondson Park. The nearest residential properties to the Proposal site are located 400 metres to the north. The population of Edmondson Park in June 2018 was 3,615 people which was approximately 45 per cent growth from the previous year (idcommunity, 2018).

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 South West Rail Link, which provided 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.

Currently the commuter parking around Edmondson Park Station is over capacity. Once existing car parks are at capacity in the morning, commuters are illegally parking in available locations in close proximity to the station (FutureRail, 2020).

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 work is anticipated to occur outside these boundaries.

Construction would require the temporary closure of the existing at-grade car park at the site resulting in the temporary relocation of parking spaces through temporary offset parking. The potential disruption to parking may have an impact upon commuters however any such impact would be temporary and minor. Construction workers would park in the wider precinct to avoid impacting on commuter parking spaces. Furthermore the displaced parking spaces would be offset by approximately 240 temporary commuter parking spaces, which would be available upon commencement of construction subject to a separate planning approval.

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.

The existing accessible toilets and staff facilities would be demolished. Temporary accessible toilet facilities would be provided while permanent accessible toilets are not available.
Inclusion of permanent accessible toilets within the Proposal would be investigated during detailed design.

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

**Operation phase**

The proposed new multi-storey commuter car park to the south of the site would result in the gaining of approximately 1,000 new 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 6.9
- 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.

**6.7 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.
6.7.1 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 22 January 2020. 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. However, as part of the delivery of the South West Rail Link, a Remediation Action Plan was prepared and implemented to ensure the land was suitable for use as a car park.

6.7.2 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 tree removal.

Due to the relatively flat 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.

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.

The construction activities have the potential to impact upon local water quality and drainage as a result of erosion through runoff and sedimentation downstream. Given the relatively flat terrain, there is relatively low risk of 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) plus the Construction Environmental Management Plan (CEMP) and Erosion and Sediment Control Plan would ensure suitable erosion control measures are put in place and maintained correctly during construction.

**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 6.8 below, stormwater would collect contaminants such as heavy metals or fuel left by vehicles using the car park, which could potentially be conveyed to the stormwater drainage infrastructure and the soil of the site. A proposed measure to mitigate this impact would be to redirect the stormwater captured through stormwater quality improvement systems before discharging into the local stormwater system. Water Sensitive Urban Design (WSUD) options would be considered for the Proposal.

**6.7.3 Mitigation measures**

A CEMP would be developed 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.

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.

**6.8 Hydrology and water quality**

**6.8.1 Existing environment**

**Surface Water**

The Proposal is located within the Maxwells Creek Catchment. The topography of the Proposal site is relatively flat. The nearest mapped waterway is an unnamed second order tributary of Maxwells Creek located 120 metres to the west of the Proposal site. The waterway is within regional parkland. A construction site dam is located 200 metres south east of the Proposal site. The waterways and waterbodies in the vicinity of the Proposal site are shown in Figure 24.
Liverpool City Council stormwater drainage infrastructure exists in close proximity to the site. The drainage in the immediate area comprises the stormwater drains and pipes within the road network.
Figure 24 Waterways and waterbodies around the Proposal site
**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. A Geotechnical Factual Report prepared by FutureRail in January 2020 identified that no groundwater was observed during boreholes drilled up to 10 metres in the Proposal site.

**Flood**

Flood prone land identified in the State Significant Precincts SEPP is located 100 metres west of the Proposal site as shown in Figure 25. The flood prone area does not appear to impact on any components of the Proposal.

---

**Figure 25** Flood planning areas under the State Significant Precincts SEPP (Proposal site shown in red)

---

6.8.2 **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. A range of mitigation measures to reduce the incidence of water quality impacts are proposed below and in Chapter 7.

Activities which would disturb soil during construction work (such as tree removal, excavation for footings, and realignment of kerbing) have the potential to impact upon local water quality as a result of erosion and sedimentation. There is also potential to contaminate local water quality as a result of accidental spills or inadequate fuel and chemical storage practices. Any translocating contaminants would be expected to flow towards the nearby waterway to the west.

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 (Transport for NSW, 2017c).

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

**Operation phase**

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.

The stormwater and drainage infrastructure would be designed in accordance with the relevant Transport for NSW, Sydney Water and Council standards and requirements. The implementation of these standards and recommendations is expected to ensure that the works do not adversely impact upon Council’s drainage infrastructure.

The Proposal would result in a minor increase in impervious area on the site due to removal of small landscaped areas within the current at-grade park layout. Therefore, the Proposal is unlikely to significantly impact upon Council’s drainage infrastructure.

The stormwater from the Proposal would collect contaminants such as heavy metals or fuel left by vehicles using the car park, which could potentially be conveyed to nearby waterways. A proposed measure to mitigate this impact would be to redirect the stormwater captured through stormwater quality improvement systems before discharging into the local stormwater system. The development is not required to comply with Liverpool City Council standards, however various water quality improvement devices and WSUD would be considered for the Proposal. Considerations include provision of gross pollutant traps for primary treatment of water and oil and sediment separating devices. The outcome of the integration of WSUD devices would be provided in the detailed design.

**6.8.3 Mitigation measures**

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 the existing drainage system.

Mitigation measures for impact during construction such as erosion and sediment control and minimising potential spills are addressed in Section 6.7 and a full list of mitigation measures is provided in Chapter 7.

**6.9 Air quality**

**6.9.1 Existing environment**

Based on a review of the existing land uses surrounding the Proposal, the existing air quality is considered to be characteristic of an urban environment, with 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’. Poor and hazardous air quality was recorded in November 2019, December 2019 and parts of January 2020 due to smoke from widespread bushfires in NSW (DPIE, 2020).

A search of the National Pollutant Inventory database 2017/18 data within Edmondson Park (postcode 2174) indicates that there are no nearby facilities that are monitored for air quality.
The closest facility which has reported pollution is over two kilometres away and is a Cleaning Compound and Toiletry Preparation Manufacturing facility.

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 commercial and recreational areas
- local residents
- pedestrians and commuters within the local area
- staff at Edmondson Park Station.

6.9.2 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 energy within materials, followed by plant/equipment use. The greatest opportunities for reducing greenhouse gas emissions associated with the Proposal are likely to be in the selection of materials.

During construction, air quality impacts would be associated with the generation of dust and emissions from stationary and moving on-site machinery and associated vehicular traffic.

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

Anticipated sources of dust and dust generating activities include:

- loading and transfer of materials from trucks
- stockpiling activities
- excavation and preparation of the columns and footings, lift pits, tree removal, drainage works and road works
- general construction works.

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

The Proposal would have a minimal impact on air quality as it would not involve extensive excavation or other land disturbance with the potential to generate significant quantities of dust. Appropriate measures would be established to manage dust emissions from demolition works.

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

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

Operation phase

It is estimated that during operation the Proposal would generate 536 inbound movements during the morning peak hour and 447 outbound trips during the afternoon peak hour.
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 either in the existing car park or on the surrounding streets. However 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.

6.9.3 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, 2018f). 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.

6.10 Waste and resources

6.10.1 Existing environment

Minimal waste is generated on the site as it is currently an at-grade car park. The waste generated includes personal waste from commuters using the car park and from the staff facilities and accessible toilet block.

6.10.2 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
- asphalt and concrete
- surplus building materials
- building wastes including metals, timbers, plastics, concrete, packaging, etc.
- general waste, including food, glass, plastic, paper and other wastes generated by construction workers.

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

**6.10.3 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. 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 the ISCA IS Rating Tool v1.2 (2017) 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.

**6.11 Bushfire risk**

**6.11.1 Existing environment**

The Proposal site is mostly mapped Bushfire Prone land under the classification vegetation buffer. The Site is located over 30 metres from a heavily vegetated area to the west.

**6.11.2 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 distance from the vegetation to the west of the site, the increased risk would be minimal.
Operation phase

All vegetation would be removed on 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.

6.11.3 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.

6.12 Non-Aboriginal heritage

6.12.1 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 180 metres south east of the Proposal site. These buildings were approved to be demolished by Liverpool City Council under DA595/2014. 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 site. The heritage items identified closest to the Proposal are outlined in Table 21.

Table 21 Non-Aboriginal heritage items near the Proposal

<table>
<thead>
<tr>
<th>Item Name</th>
<th>Address</th>
<th>Significance</th>
<th>Item/Listing Number</th>
<th>Approximate distance from the Proposal site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingleburn Military Heritage Precinct and Mont St Quentin Oval</td>
<td>Campbelltown Road, Ingleburn (Part Lot 2, DP 831152 &amp; Part Lot 1136, DP 1175991)</td>
<td>State</td>
<td>01891</td>
<td>Over 0.6 kilometres south west</td>
</tr>
</tbody>
</table>

Edmondson Park South Commuter Car Park REF – May 2020
<table>
<thead>
<tr>
<th>Item Name</th>
<th>Address</th>
<th>Significance</th>
<th>Item/Listing Number</th>
<th>Approximate distance from the Proposal site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Macquarie Field House</td>
<td>Quarter Sessions Road, Macquarie Fields (Lots 1 DP 612265 and Lot 1 Lot 1 DP828871)</td>
<td>State</td>
<td>00424</td>
<td>Over 1.5 kilometres south east</td>
</tr>
</tbody>
</table>

### 6.12.2 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.

### 6.12.3 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, 2016a) would be followed.

### 6.13 Sustainability

The design of the Proposal would be based on the principles of sustainability, including aiming for an excellent rating as a program under the ISCA Infrastructure Sustainability Rating Tool Version 1.2 and the Transport for NSW Environmental Management System. These guidelines require a number of mandatory and discretionary initiatives to be applied. Refer to Section 3.2.3 for more information regarding the application of these guidelines.

Approximately 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 provisioned for in the Proposal to support alternative vehicle use. Renewable energy options including rooftop solar panels such as those shown in Figure 26 and batteries would be investigated in detailed design. WSUD would also be considered as identified in Section 6.8 to minimise impacts from stormwater runoff from the Proposal.
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 (AEP) 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 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 a vegetation buffer zone and would be designed with appropriate fire protection measure as outlined in 6.11.

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 an AS 14064-2 (Greenhouse Gases - project level) compliant carbon footprinting exercise in accordance with Transport for NSW’s *Greenhouse Gas Inventory Guide for Construction Projects* (Transport for NSW, 2013). The carbon footprint would be used to inform decision making in design and construction. Materials used in construction the Proposal would be selected on the basis of sustainability principles, in particular lower carbon content and use of recycled materials to minimise generation of greenhouse gases.

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 either in the existing car park or on 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.

Furthermore renewable energy options such as solar panels and battery storage would be investigated during detailed design and incorporated where possible into the Proposal. 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 January 2020 identified the following major applications are listed in Edmondson Park for approval at this time:

- construction of Stage 1 of the Edmondson Park South Town Centre surrounding the Proposal site
- vegetation clearing, bulk earthworks and temporary stormwater/drainage works surrounding the Proposal site
• construction of Buchan Road west of proposed Edmondson Park Northern Commuter Car Park site.
• construction of three residential flat buildings with basement parking at 190 Croatia Avenue.

A construction site has also been established to the south of the Proposal site, however it is currently used mostly for staff parking and site compounds. Vegetation clearing, bulk earthworks and temporary stormwater/drainage works for the Edmondson Park Town centre south of the rail corridor has been undertaken on land surrounding the Proposal site. Stage 1 of the Edmondson Park development located to the east of the Proposal site is also currently under construction and is anticipated to open this year (Frasers Property, 2020).

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 22.

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.
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. The CEMP would provide a centralised mechanism through which all potential environmental impacts relevant to the Proposal would be managed and outline a framework of procedures and controls for managing environmental impacts during construction.

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

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

The CEMP would 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 22. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 22 Proposed mitigation measures

<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>General</strong></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>A Construction Environmental Management Plan (CEMP) would be prepared by the Construction Contractor in accordance with the relevant requirements of <em>Guideline for Preparation of Environmental Management Plans</em>, Department of Infrastructure, Planning and Natural Resources, 2004) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.</td>
</tr>
<tr>
<td>2.</td>
<td>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.</td>
</tr>
<tr>
<td>3.</td>
<td>An Environmental Controls Map (ECM) would be developed by the Construction Contractor in accordance with Transport for NSW's <em>Guide to Environmental Controls Map</em> (Transport for NSW, 2017b) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.</td>
</tr>
<tr>
<td>4.</td>
<td>Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.</td>
</tr>
<tr>
<td>No.</td>
<td>Mitigation measure</td>
</tr>
<tr>
<td>-----</td>
<td>----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>5.</td>
<td>Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.</td>
</tr>
<tr>
<td>6.</td>
<td>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.</td>
</tr>
<tr>
<td>7.</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Traffic and transport**

<table>
<thead>
<tr>
<th>8.</th>
<th>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:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• 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</td>
</tr>
<tr>
<td></td>
<td>• maximising safety and accessibility for pedestrians and cyclists</td>
</tr>
<tr>
<td></td>
<td>• ensuring adequate sight lines to allow for safe entry and exit from the site</td>
</tr>
<tr>
<td></td>
<td>• ensuring access to railway stations, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made)</td>
</tr>
<tr>
<td></td>
<td>• managing impacts and changes to on and off-street parking and requirements for any temporary replacement provision</td>
</tr>
<tr>
<td></td>
<td>• parking locations for construction workers away from stations and busy residential areas and details of how this would be monitored for compliance</td>
</tr>
<tr>
<td></td>
<td>• routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses</td>
</tr>
<tr>
<td></td>
<td>• 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</td>
</tr>
<tr>
<td></td>
<td>• communication with adjacent construction sites regarding traffic management measures and changes to parking, pedestrian access and/or traffic conditions</td>
</tr>
<tr>
<td></td>
<td>• 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.</td>
</tr>
<tr>
<td></td>
<td>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.</td>
</tr>
<tr>
<td>9.</td>
<td>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.</td>
</tr>
<tr>
<td>10.</td>
<td>Road Occupancy Licences for temporary road closures would be obtained, where required.</td>
</tr>
</tbody>
</table>

Edmondson Park South Commuter Car Park REF – May 2020
No. Mitigation measure

11. During detailed design consideration would be given to the following recommendation from the TTAIA (FutureRail, 2020):
   - potential closure of Henderson Road midblock to all traffic except buses and potential closure of Northern Access Road midblock to improve pedestrian connectivity with northern station entrance
   - intersection design for Buchan Avenue and Soldiers Parade to include a southbound right turn into Buchan Avenue.

Landscape and visual amenity

12. An Urban Design Plan is to be submitted to Transport for NSW and endorsed. The Urban Design Plan is to address the fundamental design principles as outlined in the Transport for NSW Urban Design Guidelines. The Urban Design 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 the 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, Transport for NSW, Interim 2016
   - TAP Urban Design Plan, Guidelines, Transport for NSW, Draft 2018
   - Commuter Car Parks, urban design guidelines, Transport for NSW, Interim 2017

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.

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.
<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.</td>
<td>During construction, graffiti would be removed in accordance with Transport for NSW’s Standard Requirements.</td>
</tr>
<tr>
<td>18.</td>
<td>Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the Interim Construction Noise Guideline (Department of Environment and Climate Change, 2009), Construction Noise and Vibration Strategy (Transport for NSW, 2019) and the Noise and Vibration Impact Assessment for the Proposal (Muller Acoustic Consulting, 2020). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.</td>
</tr>
</tbody>
</table>
| 19. | 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  
- 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. |
| 20. | 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. |
<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.</td>
<td>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.</td>
</tr>
<tr>
<td>22.</td>
<td>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 Environment and Planning Manager for any work outside standard hours.</td>
</tr>
<tr>
<td>23.</td>
<td>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 (Transport for NSW, 2019). This would include restricting the hours that very noisy activities can occur.</td>
</tr>
<tr>
<td>24.</td>
<td>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.</td>
</tr>
</tbody>
</table>
| 25. | Vibration resulting from construction and received at any structure outside of the Proposal area would be managed in accordance with:  
| 26. | 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). |
| 27. | 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

28. 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.
### Mitigation measure

#### No. 29.

If unforeseen Aboriginal objects are uncovered during construction, the procedures contained in Transport for NSW’s *Unexpected Heritage Finds Guideline* (Transport for NSW, 2016a) 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 Environment and Planning Manager 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.

#### No. 30.

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* (Transport for NSW, 2016a) 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 Environment and Planning Manager 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.

#### No. 31.

Construction of the Proposal must be undertaken in accordance with Transport for NSW’s *Vegetation Management (Protection and Removal) Guideline* (Transport for NSW, 2018c) and Transport for NSW’s *Fauna Management Guideline* (Transport for NSW, 2018d).

#### No. 32.

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.

#### No. 33.

Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. Trees/vegetation nominated to be removed in the Offset calculations for car park upgrade – Edmondson Park Station (Cumberland Ecology, 2020) would be clearly demarcated onsite prior to construction, to avoid unnecessary vegetation removal. Trees to be retained would be protected through temporary protection measures discussed below.

#### No. 34.

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.

#### No. 35.

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 Environment and Planning Manager to coordinate the response which may include contacting an arborist to inspect and provide advice on remedial action, where possible.

#### No. 36.

Should the detailed design or onsite work 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 Transport for NSW’s Tree Removal Application Form and submit it to Transport for NSW for approval.
<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>37.</td>
<td>Weed control measures, consistent with Transport for NSW’s <em>Weed Management and Disposal Guideline</em> (Transport for NSW, 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 <em>Biosecurity Act 2015</em>.</td>
</tr>
<tr>
<td>38.</td>
<td>A vegetation offset plan is to be prepared for the Proposal. Any vegetation removed would be offset in accordance with Vegetation Offset Guide (Transport for NSW, 2019) and in consultation with the relevant council, and/or the owner of the land upon which the vegetation is to be planted.</td>
</tr>
</tbody>
</table>

**Socio-economic**

<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>39.</td>
<td>Sustainability criteria for the Proposal would be established in accordance with the Sustainability Strategic Management Plan to encourage the Construction Contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.</td>
</tr>
<tr>
<td>40.</td>
<td>Feedback through the consultation process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.</td>
</tr>
<tr>
<td>41.</td>
<td>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.</td>
</tr>
<tr>
<td>42.</td>
<td>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.</td>
</tr>
<tr>
<td>43.</td>
<td>The community would be kept informed of construction progress, activities and impacts in accordance with the CLMP to be developed prior to construction.</td>
</tr>
<tr>
<td>44.</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Soils and water**

<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>45.</td>
<td>Prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the <em>Blue Book</em> ‘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.</td>
</tr>
<tr>
<td>46.</td>
<td>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.</td>
</tr>
<tr>
<td>47.</td>
<td>Stockpiles would be located outside of drainage paths and away from drainage lines.</td>
</tr>
<tr>
<td>48.</td>
<td>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.</td>
</tr>
<tr>
<td>No.</td>
<td>Mitigation measure</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------</td>
</tr>
<tr>
<td>49.</td>
<td>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 <em>Chemical Storage and Spill Response Guidelines</em> (Transport for NSW, 2018e).</td>
</tr>
<tr>
<td>50.</td>
<td>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 <em>Chemical Storage and Spill Response Guidelines</em> (Transport for NSW, 2018e) 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.</td>
</tr>
<tr>
<td>51.</td>
<td>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 Environment and Planning Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the PoEO Act.</td>
</tr>
<tr>
<td>52.</td>
<td>The existing drainage systems would remain operational throughout the construction phase.</td>
</tr>
<tr>
<td>53.</td>
<td>Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the <em>Waste Classification Guidelines</em> (EPA, 2014) and Transport for NSW’s <em>Water Discharge and Reuse Guideline</em> (Transport for NSW, 2017c).</td>
</tr>
<tr>
<td>54.</td>
<td>Implementation of WSUD would be investigated during detailed design and incorporated where possible.</td>
</tr>
</tbody>
</table>

**Air quality**

<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>55.</td>
<td>Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW’s <em>Air Quality Management Guideline</em> (Transport for NSW, 2018f).</td>
</tr>
<tr>
<td>56.</td>
<td>Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.</td>
</tr>
<tr>
<td>57.</td>
<td>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.</td>
</tr>
<tr>
<td>58.</td>
<td>Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.</td>
</tr>
</tbody>
</table>
| 59. | To minimise the generation of dust from construction activities, the following measures would be implemented:  
• apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces)  
• cover stockpiles when not in use  
• appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading  
• prevent mud and dirt being tracked onto sealed road surfaces. |

**Waste and contamination**
<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
</table>
| 60. | 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. |
| 61. | 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. |
| 62. | 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. |
| 63. | All spoil and waste must be classified in accordance with the Waste Classification Guidelines Part 1: Classifying waste (EPA, 2014) prior to disposal. |
| 64. | Any concrete washout would be established and maintained in accordance with Transport for NSW’s Concrete Washout Guideline – (Transport for NSW, 2018g) with details included in the CEMP and location marked on the ECM. |

**Bushfire Risk**

<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>65.</td>
<td>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.</td>
</tr>
</tbody>
</table>
| 66. | 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**

<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>67.</td>
<td>Detailed design and construction of the Proposal is to be undertaken in accordance with the ISCA Infrastructure Sustainability Rating Scheme (v1.2)</td>
</tr>
<tr>
<td>68.</td>
<td>The detailed design process would undertake an AS 14064-2 (Greenhouse Gases - project level) compliant carbon footprinting exercise in accordance with Transport for NSW’s Greenhouse Gas Inventory Guide for Construction Projects (Transport for NSW, 2013). The carbon footprint would to be used to inform decision making in design and construction.</td>
</tr>
<tr>
<td>69.</td>
<td>Investigation of renewable energy options during detailed design to be incorporated into the operation of the car park.</td>
</tr>
<tr>
<td>No.</td>
<td>Mitigation measure</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------</td>
</tr>
<tr>
<td>70.</td>
<td>All new electrical equipment for the car park to be at least market average star rating. In categories where no star ratings are available, equipment purchased should be recognised as high efficiency either by being ENERGY STAR accredited, in a high efficiency band under Australian Standards or being above-average efficiency of Greenhouse and Energy Minimum Standards (GEMS) registered products.</td>
</tr>
<tr>
<td>71.</td>
<td>Water consumption during construction would be monitored and reported on and consumption of potable water would be reduced where practicable.</td>
</tr>
<tr>
<td>72.</td>
<td>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.</td>
</tr>
</tbody>
</table>

**Cumulative**

<table>
<thead>
<tr>
<th>No.</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>73.</td>
<td>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.</td>
</tr>
<tr>
<td>74.</td>
<td>Consultation with relevant stakeholders undertaking development in the vicinity of the Proposal would be undertaken prior to finalisation of the detailed design.</td>
</tr>
</tbody>
</table>
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 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 operation of the proposed car park
- moderate noise and visual impacts including overshadowing associated with the new structure
- temporary changes to access arrangements (including pedestrian diversions) and minor delays on the adjacent road network during construction
- loss of vegetation within the Proposal site which would be offset in accordance with the *Vegetation Offset Guide* (Transport for NSW 2019)
- temporary visual, noise and vibration impacts during the construction period.

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

The Proposal 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.
References

Australian Bureau of Statistics (ABS), 2016, Census Data, Journey to work data

Australian Bureau Statistics, 2016a, 2016 Census QuickStats: Edmondson Park, Online: 

Austroads, 2016, Austroads -Guide to Road Design, Sydney

Department of Environment and Climate Change, 2009, Interim Construction Noise Guideline, Sydney


Department of Environment, Climate Change and Water & NSW Department of Planning 2010, Sydney Growth Centres -Strategic Assessment Program Report, NSW

Department of Environment, Climate Change and Water, 2011, NSW Road Noise Policy, Sydney


Department of Infrastructure, Planning and Natural Resources, 2004, Guideline for Preparation of Environmental Management Plans, Sydney

Department of Planning and Environment (DPE) 2015, Apartment Design Guideline, Sydney


Department of Planning and Infrastructure (DPI) 2012, Edmondson Park South Development Control Plan (DCP), Sydney

EPA, 2014, Waste Classification Guidelines, Sydney


Frasers Property 2018, MP 10_0118 MOD 4 - Modification to Edmondson Park South Concept Plan and Amendment to State Environmental Planning Policy (State Significant Precincts) 2005, Online: 


FutureRail 2019, Edmondson Park: Preliminary Geotechnical Report, Sydney

FutureRail 2020, Traffic, Transport and Access Impact Assessment - Edmondson Park Station Commuter Car Park, Sydney


NSW Heritage Office, 2006, *Photographic Recording of Heritage Items Using Film or Digital Capture*, Sydney

OEH, 2010, *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW South Wales*, Sydney


Transport for NSW, 2016a, *Unexpected Heritage Finds Guideline*, Sydney
Transport for NSW 2016c, *Vegetation Offset Calculator*, Sydney
Transport for NSW, 2017c, *Water Discharge and Reuse Guideline*, Sydney
Transport for NSW, 2018c, *Vegetation Management (Protection and Removal) Guideline*, Sydney
Transport for NSW, 2018d, *Fauna Management Guideline*, Sydney
Transport for NSW, 2018e, *Chemical Storage and Spill Response Guidelines*, Sydney
Transport for NSW, 2018g, *Concrete Washout Guideline - draft*, Sydney
Transport for NSW, 2019, *Vegetation Offset Guide*, Sydney
Transport for NSW, 2020, *Commuter Car Park Program - Climate Risk Assessment*, Sydney
## Appendix A  Consideration of matters of National Environmental Significance

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

<table>
<thead>
<tr>
<th>Matters of NES</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any impact on a World Heritage property?</td>
<td>Nil</td>
</tr>
<tr>
<td>There are no World Heritage properties within 1km of the Proposal.</td>
<td></td>
</tr>
<tr>
<td>Any impact on a National Heritage place?</td>
<td>Nil</td>
</tr>
<tr>
<td>There are no National Heritage places within 1km of the Proposal.</td>
<td></td>
</tr>
<tr>
<td>Any impact on a wetland of international importance?</td>
<td>Nil</td>
</tr>
<tr>
<td>There are no wetlands of international importance within 1km of the Proposal.</td>
<td></td>
</tr>
<tr>
<td>Any impact on a listed threatened species or communities?</td>
<td>Nil</td>
</tr>
<tr>
<td>It is unlikely that the development of the Proposal would significantly affect listed threatened species of communities (see Section 6.5)</td>
<td></td>
</tr>
<tr>
<td>Any impacts on listed migratory species?</td>
<td>Nil</td>
</tr>
<tr>
<td>It is unlikely that the development of the Proposal would significantly affect any listed migratory species.</td>
<td></td>
</tr>
<tr>
<td>Does the Proposal involve a nuclear action (including uranium mining)?</td>
<td>Nil</td>
</tr>
<tr>
<td>The Proposal does not involve a nuclear action.</td>
<td></td>
</tr>
<tr>
<td>Any impact on a Commonwealth marine area?</td>
<td>Nil</td>
</tr>
<tr>
<td>There are no Commonwealth marine areas in the vicinity of the Proposal.</td>
<td></td>
</tr>
<tr>
<td>Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources?</td>
<td>Nil</td>
</tr>
<tr>
<td>The Proposal is for a transport facility and does not relate to coal seam gas or mining.</td>
<td></td>
</tr>
<tr>
<td>Additionally, any impact (direct or indirect) on Commonwealth land?</td>
<td>Nil</td>
</tr>
<tr>
<td>The Proposal would not be undertaken on or near any Commonwealth land.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix B  Consideration of clause 228

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

<table>
<thead>
<tr>
<th>Factor</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>(a) Any environmental impact on a community?</td>
<td>Minor</td>
</tr>
<tr>
<td>There would be some temporary impacts to the community during</td>
<td></td>
</tr>
<tr>
<td>construction, particularly in relation to noise, traffic, access and</td>
<td></td>
</tr>
<tr>
<td>visual amenity. The temporary displacement of the existing car park</td>
<td></td>
</tr>
<tr>
<td>would be an inconvenience to commuters, however offset parking would</td>
<td></td>
</tr>
<tr>
<td>be provided under a separate approval to minimise this impact. Mitigation</td>
<td></td>
</tr>
<tr>
<td>measures outlined in Chapter 7 would be implemented to manage and</td>
<td></td>
</tr>
<tr>
<td>minimise adverse impacts.</td>
<td></td>
</tr>
<tr>
<td>(b) Any transformation of a locality?</td>
<td>Minor</td>
</tr>
<tr>
<td>The Proposal would include the introduction of a new visible element</td>
<td></td>
</tr>
<tr>
<td>through the construction of a new multi-storey car park over the</td>
<td></td>
</tr>
<tr>
<td>existing at-grade commuter car park south of Edmondson Park Station.</td>
<td></td>
</tr>
<tr>
<td>The Proposal would have a positive contribution to the locality by</td>
<td></td>
</tr>
<tr>
<td>helping to address the high demand for commuter car parking spaces.</td>
<td></td>
</tr>
<tr>
<td>The Proposal also provides infrastructure that supports potential</td>
<td></td>
</tr>
<tr>
<td>growth and provides improved public transport facilities.</td>
<td></td>
</tr>
<tr>
<td>(c) Any environmental impact on the ecosystem of the locality?</td>
<td>Negligible</td>
</tr>
<tr>
<td>Due to the removal of planted vegetation within the site, the Proposal</td>
<td></td>
</tr>
<tr>
<td>would have a negligible impact on the local ecosystem as discussed in</td>
<td></td>
</tr>
<tr>
<td>Section 6.5. Vegetation removal would be subject to offsetting in</td>
<td></td>
</tr>
<tr>
<td>accordance with the Transport for NSW Vegetation Offset Guide</td>
<td></td>
</tr>
<tr>
<td>(Transport for NSW, 2019).</td>
<td></td>
</tr>
<tr>
<td>(d) Any reduction of the aesthetic, recreational, scientific or other</td>
<td>Moderate</td>
</tr>
<tr>
<td>environmental quality or value of a locality?</td>
<td></td>
</tr>
<tr>
<td>Some short-term impacts during construction would be anticipated,</td>
<td></td>
</tr>
<tr>
<td>particularly in relation to noise, traffic and access and visual</td>
<td></td>
</tr>
<tr>
<td>amenity. There would be some moderate impacts to visual amenity in</td>
<td></td>
</tr>
<tr>
<td>particular for future residents adjacent the Proposal site.</td>
<td></td>
</tr>
<tr>
<td>The visual impacts from the Proposal are anticipated to be moderate</td>
<td></td>
</tr>
<tr>
<td>for adjacent residents during operation. A landscape and visual</td>
<td></td>
</tr>
<tr>
<td>impact assessment was completed and is summarised in Section 6.2.</td>
<td></td>
</tr>
</tbody>
</table>
(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 Aboriginal Heritage items are unlikely to be harmed by the Proposal. The visual impacts from the Proposal are anticipated to be 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 consistent with the form and scale of adjacent developments being/to be constructed as part of the Edmondson Park South town centre.

(f) Any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act 1974)?

The impacts on the habitat of protected fauna is likely to be negligible as the site currently consists of landscaped plantings within the at-grade car park (see Section 6.5). Vegetation removal would be required to facilitate the development of the Proposal and would be subject to offsetting in accordance with the Transport for NSW Vegetation Offset Guide (Transport for NSW, 2019).

(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). Vegetation removal would be required to facilitate the development of the Proposal and would be subject to offsetting in accordance with the Transport for NSW Vegetation Offset Guide (Transport for NSW, 2019).

(h) Any long-term effects on the environment?

The Proposal is unlikely to have any long-term effects on the environment.

(i) Any degradation of the quality of the environment?

The Proposal would result in the removal of vegetation and minor earthworks. Impacts from the Proposal would be minimised by the implementation of the mitigation measures identified in Chapter 7.

(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.

(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.

(l) Any pollution of the environment?

The Proposal is unlikely to cause any pollution to the environment provided the recommended mitigation measures are implemented.
**Factor** | **Impacts**
--- | ---
(m) Any environmental problems associated with the disposal of waste? | Negligible
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.

(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? | Nil
The Proposal is unlikely increase demands on resources that are or are likely to become in short supply.

(o) Any cumulative environmental effect with other existing or likely future activities? | Moderate
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.

(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? | Nil
The Proposal is not located in the coastal zone and would not affect or be affected by any coastal processes or hazards.