NSW GOVERNMENT

Transport for NSW

Schofields Commuter Car Park

Review of Environmental Factors

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

May 2021

Contents

Document control	
Status:	Final
Date of issue:	11 May 2021
Version:	1.0
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Abbreviations

Term	Meaning
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
ARI	Average Recurrence Interval
ASA	Asset Standards Authority (refer to Definitions)
ASS	Acid Sulfate Soils
BCA	Building Code of Australia
BC Act	*Biodiversity Conservation Act 2016* (NSW)
CBD	Central Business District
CCTV	Closed Circuit TV
CEMP	Construction Environmental Management Plan
CLM Act	*Contaminated Land Management Act 1997* (NSW)
CNVMP	Construction Noise and Vibration Management Plan
CPTED	Crime Prevention Through Environmental Design
DAWE	Department of Agriculture, Water and the Environment (Commonwealth)
DBH	Diameter Breast Height
DBYD	Dial Before You Dig
D&C	Design & Construct
DDA	*Disability Discrimination Act 1992* (Commonwealth)
DoE	Commonwealth Department of the Environment
DP&E	NSW Department of Planning and Environment
DPIE	NSW Department of Planning, Industry and Environment
DSAPT	*Disability Standards for Accessible Public Transport (2002)*
DSI	Detailed Site Investigation (Phase II Contamination Investigation)
ECM	Environmental Controls Map
EES	NSW Environment, Energy and Science (Division of Department of Planning Industry and Environment) (formerly OEH)
EMS	Environmental Management System
EPA	Environment Protection Authority

Term	Meaning
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EP&A Regulation	*Environmental Planning and Assessment Regulation 2000* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPI	Environmental Planning Instrument
EPL	Environment Protection Licence
ESD	Ecologically Sustainable Development (refer to Definitions)
FM Act	*Fisheries Management Act 1994* (NSW)
Heritage Act	*Heritage Act 1977* (NSW)
ICNG	*Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2000).
Infrastructure SEPP	*State Environmental Planning Policy (Infrastructure) 2007* (NSW)
LEP	Local Environmental Plan
LGA	Local Government Area
LoS	Level of Service
NES	National Environmental Significance
NPW Act	*National Parks and Wildlife Act 1974* (NSW)
NSW	New South Wales
OEH	Formerly NSW Office of the Environment and Heritage
OOHW	Out of hours works
PDP	Public Domain Plan
POEO Act	*Protection of the Environment Operations Act 1997* (NSW)
RBL	Rating Background Level
REF	Review of Environmental Factors (this document)
Roads Act	*Roads Act 1993* (NSW)
Roads and Maritime	Former NSW Roads and Maritime Services (now Transport for NSW)
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
TCP	Traffic Control Plan
TMP	Traffic Management Plan

Term	Meaning
TPZ	Tree Protection Zone
UHI	Urban heat island
UDP	Urban Design Plan
WARR Act	*Waste Avoidance and Resource Recovery Act 2001* (NSW)
WM Act	*Water Management Act 2000* (NSW)

Definitions

Term	Meaning
At-grade	A ground level car park
Average Recurrence Interval	The likelihood of occurrence, expressed in terms of the long-term average number of years, between flood events as large as or larger than the design flood event. For example, floods with a discharge as large as or larger than the 100-year ARI flood will occur on average once every 100-years.
Asset Standards Authority	The ASA is an independent body within Transport for NSW, responsible for engineering governance, assurance of design safety, and ensuring the integrity of transport and infrastructure assets. Design Authority functions formerly performed by RailCorp are now exercised by the TfNSW Asset Management.
Concept design	The concept design is the preliminary design presented in this REF, which would be refined by the contractor (should the Proposal proceed) to a design suitable for construction (subject to Transport for NSW acceptance).
Construction	Includes all work in respect of the Project, other than Enabling Works and Site Establishment Works, survey, acquisitions, fencing, investigative drilling or excavation, building/road dilapidation surveys, or other activities determined by the TfNSW ADEM to have minimal environmental impact such as minor access roads, minor adjustments to services/utilities, establishing temporary construction compounds (in accordance with this approval), or minor clearing (except where threatened, species, populations or ecological communities would be affected, unless otherwise agreed by the ADEM).
Design and Construct Contract	A method to deliver a project in which the design and construction services are contracted by a single entity known as the contractor. The Contractor completes the project by refining the concept design presented in the REF and completing the detailed design so that it is suitable for construction (subject to Transport for NSW acceptance). The contractor is therefore responsible for all work on the project, both design and construction.
Detailed design	Detailed design broadly refers to the process that the contractor undertakes (should the Proposal proceed) to refine the concept design to a design suitable for construction (subject to Transport for NSW acceptance).
Disability Standards for Accessible Public Transport	The Commonwealth *Disability Standards for Accessible Public Transport 2002* ("Transport Standards") (as amended) are a set of legally enforceable standards, authorised under the Commonwealth *Disability Discrimination Act 1992* (DDA) for the purpose of removing discrimination 'as far as possible' against people with disabilities. The Transport Standards cover premises, infrastructure and conveyances, and apply to public transport operators and premises providers.
Ecologically Sustainable Development	As defined by clause 7(4) Schedule 2 of the EP&A Regulation. Development that uses, conserves and enhances the resources of the community so that ecological processes on which life depends are maintained, and the total quality of life, now and in the future, can be increased.
Enabling Works	Works required to enable main construction activities including survey works, road modifications to Schofields Road, Altrove Boulevard and Calder Street, and the removal of the Altrove Sales and Information Centre.

Term	Meaning
Feasible	A work practice or abatement measure is feasible if it is capable of being put into practice or of being engineered and is practical to build given project constraints such as safety and maintenance requirements.
Interchange	Transport interchange refers to the area/s where passengers transit between vehicles or between transport modes. It includes the pedestrian pathways and cycle facilities in and around an interchange.
Noise sensitive receiver	In addition to residential dwellings, noise sensitive receivers include, but are not limited to, hotels, entertainment venues, pre-schools and day care facilities, educational institutions (e.g. schools, TAFE colleges), health care facilities (e.g. nursing homes, hospitals), recording studios and places of worship/religious facilities (e.g. churches).
Opal card	The integrated ticketing smartcard being introduced by Transport for NSW.
Out of hours works	Defined as works *outside* standard construction hours (i.e. outside of 7am to 6pm Monday to Friday, 8am to 1pm Saturday and no work on Sundays/public holidays).
Park&Ride	A transportation scheme in which travellers park their vehicles some distance away from a city centre, tourist attraction, etc and complete the journey by public transport.
Proponent	A person or body proposing to carry out an activity under Division 5.1 of the EP&A Act - in this instance, Transport for NSW.
Reasonable	Selecting reasonable measures from those that are feasible involves making a judgment to determine whether the overall benefits outweigh the overall adverse social, economic and environmental effects, including the cost of the measure.
Sensitive receivers	Land uses which are sensitive to potential noise, air and visual impacts, such as residential dwellings, schools and hospitals.
Site Establishment	Works required to establish compound sites and ancillary facilities (not including minor construction ancillary facilities).
The Proposal	The construction and operation of the Schofields Commuter Car Park.
Vegetation Offset Guide	The Transport for NSW guide that applies where there is vegetation clearing proposed, and where the impact of the proposed clearing is not deemed 'significant' for the purposes of section 5.5 of the EP&A Act. The Guide provides for planting of a minimum of eight trees for each large tree with a diameter at breast height (DBH) of more than 60 cm, four trees where the DBH is 15-60 cm, or two trees where DBH is less than 15 cm.

Executive summary

Overview

Transport for NSW is proposing to undertake the Schofields Commuter Car Park (the Proposal) to improve access to commuter car parking spaces 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 would provide a range of benefits, including:

- improved customer access to the public transport network
- encouraging mode shift away from private vehicles
- providing customers with more flexibility in the first and last part of their journey
- contributing to reducing congestion on our road network.

As part of this program, the Proposal would aim to provide approximately 700 additional commuter car parking spaces west of Schofields Station.

The Proposal would include the following key features:

- enabling works including road modifications and removal of the Altrove Sales and Information Centre
- an at-grade car park with approximately 700 commuter car parking spaces including five accessible spaces and dedicated motorcycle parking
- conversion of 15 general parking spaces into 10 accessible spaces within the existing commuter car park on Bridge Street, outside the station
- a new accessible path from the car park to Schofields Station
- CCTV, lighting and wayfinding
- Transport Park&Ride infrastructure (i.e. Opal card activated boom gates), and
- provision for future electric vehicle charging spaces.

The Proposal would provide access and egress from:

- Calder Street off Schofields Road
- Calder Street from Altrove Boulevard, and
- Bridge Street

The extension of Calder Street, south of the Proposal, and Altrove Boulevard would be undertaken by Stockland. This work is expected to be complete at the time of the car park opening, however access to the car park has been assessed under the two scenarios below in the event Stockland's work is delayed. They are as follows:

- Scenario 1 – Altrove Boulevard and Calder Street completed and operational plus access/egress via Schofields Road and left in/left out from Bridge Street, and
- Scenario 2 – Altrove Boulevard and Calder Street incomplete, access/egress via Schofields Road and left in/left out from Bridge Street only.

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

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

Subject to approval, construction is expected to commence in mid-2021 and is expected to be complete in mid-2022. A detailed description of the Proposal is provided in Chapter 3 of this REF. An artist's impression of the Proposal from two viewpoints is provided in Figure 1a and Figure 1b while a schematic overview of the Proposal is shown in Figure 2.

Need for the Proposal

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

Transport for NSW recognises the critical role Transport Park&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. Commuter car parks are important gateways to the transport system and as such play a critical role in shaping the customer experience and perception of public transport.

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

Figure 1a Artist's impressions of the Proposal

Figure 1b Artist's impressions of the Proposal

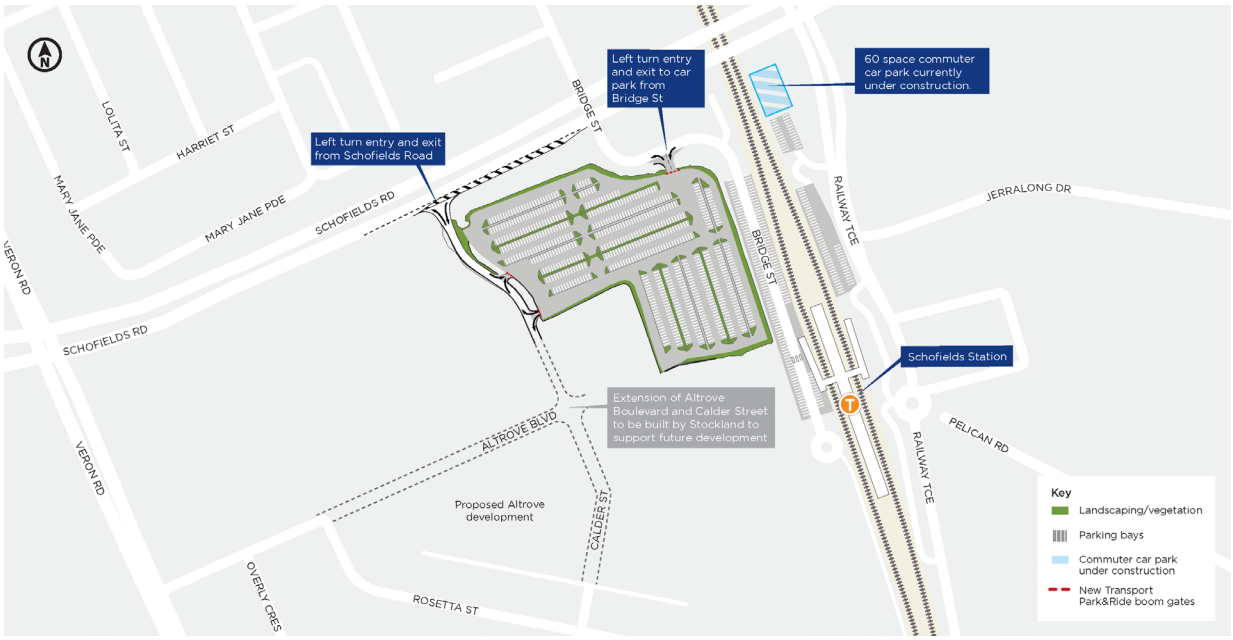

Figure 2 Key features of the Proposal (indicative only, subject to detailed design)

Targeted community and stakeholder consultation

Targeted community and stakeholder consultation activities for the Proposal were undertaken from 26 March 2021 to 11 April 2021 to ensure nearby residents and surrounding community members are aware of the Proposal and had the opportunity to provide feedback and ask questions. Concept design plans for the Proposal have been made available on the project webpage with the public invited to submit feedback to help Transport for NSW understand what is important to customers and the community. Further information about these specific consultation activities is included in Section 5 of this REF.

During the consultation period a Project Infoline (1800 684 490), email address (projects@transport.nsw.gov.au) and project webpage (transport.nsw.gov.au/Schofields) was available for members of the public to make enquiries and view information about the Proposal.

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

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

Should the Proposal proceed to construction, the community would be kept informed throughout the duration of the construction period. Figure 3 shows the planning approval and consultation process for the Proposal.

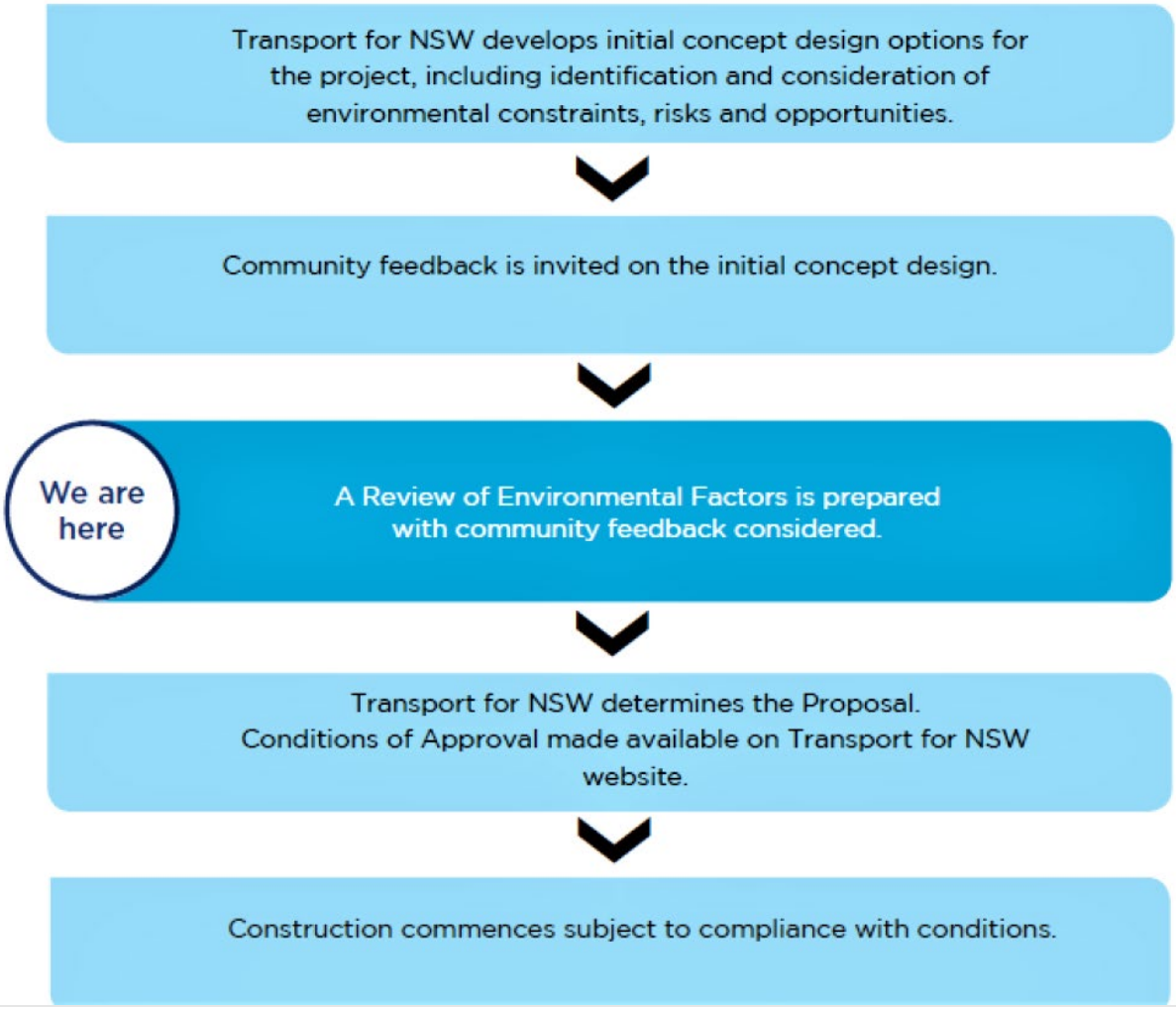

Figure 3 Planning approval and consultation process for the Proposal

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 accessible transport infrastructure by providing more commuter parking. The following key impacts have been identified should the Proposal proceed:

- an increase in traffic movements in Bridge Street, Schofields Road, Altrove Boulevard and Calder Street
- temporary visual, noise and air quality impacts during construction
- increased traffic noise impacts on residents in Bridge Street and Altrove Boulevard
- potential to alter the behaviour of surface water in the vicinity of the car park, increasing run off to Council's stormwater network.

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

Conclusion

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

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

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

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

1 Introduction

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

1.1 Overview of the Proposal

1.1.1 The need for the Proposal

Transport for NSW recognises the critical role Park&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 it is providing more commuter car parks where they are needed. 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.

The existing at-grade car parking facilities at Schofields Station comprises a total of 352 spaces. These car parks are typically full by 8:00am on weekdays, and parking surveys have identified that demand exceeds capacity by as much as 600 spaces.

The Proposal would address the existing parking capacity issues and also assist in responding to forecasted growth in the region and as such would support growth in commercial and residential development.

1.1.2 Key features of the Proposal

The key features of the Proposal are summarised as follows:

- enabling works including road modifications and removal of the Altrove Sales and Information Centre
- an at-grade car park with approximately 700 commuter car parking spaces including five accessible spaces
- additional motorcycle parking spaces
- conversion of fifteen general parking spaces into ten accessible spaces within the existing commuter car park on Bridge Street, outside the station
- a new access path from car park to Schofields Station
- CCTV, lighting and wayfinding
- Transport Park&Ride infrastructure (i.e. Opal card activated boom gates)
- provision for future electric vehicle charging spaces.

Subject to approval, construction is expected to commence in mid-2021 and is expected to be complete in mid-2022. A detailed description of the Proposal is provided in Chapter 3 of this Review of Environmental Factors (REF).

Source: EMM (2021); TfNSW (2021); DFSI (2020, 2017); GA (2011); ASGC (2006)

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GDA 1994 MGA Zone 56

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KEY

- Proposal site
- Altrove Boulevard/ Calder Street extension
- Train station
- Rail line
- Major road
- Minor road
- Watercourse/drainage line
- Waterbody
- NPWS reserve
- Local government area

INSET KEY

- Main road
- NPWS reserve
- State forest

Regional context

Review of environmental factors
Transport for New South Wales
Figure 4

EMM creating opportunities

1.2 Location of the Proposal

The Proposal is located in the suburb of Schofields, NSW, approximately 45 kilometres west of the Sydney Central Business District (CBD) within the Blacktown local government area (LGA). The current location of Schofields Station was established in 2011 and is serviced by T1 North Shore & Western Line and T5 Cumberland Line of the Sydney Trains network. The regional location of the Proposal is shown in Figure 4.

1.2.1 Planned growth area

The North West Priority Growth Area was established under the *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* to facilitate release of land for residential, employment and other urban development. Areas of Schofields and surrounding suburbs have subsequently been rezoned by the NSW Government as part of the North West Priority Growth Area.

Future land use plans for Schofields propose the addition of 2,950 new homes and local amenities close to transport options proposed for the Schofields Road public transport corridor. This includes medium to high density residential land use, indicating a large-expected increase in patronage demand at Schofields Station at the completion of the development.

1.3 Existing site, infrastructure and land uses

The suburb of Schofields is bordered by Riverstone to the north, Rouse Hill to the north-east, The Ponds to the east, Quakers Hill to the south and Marsden Park to the west. Currently, the region surrounding Schofields Station is under development, with sparsely spread residential dwellings either newly completed or in progress. A Woolworths shopping complex lies to the east of the station, which has its own car park facility with restricted customer-only parking arrangements.

Existing at-grade commuter car parks servicing Schofields Station are located to the east and west of the station (Figure 5). Land use zoning surrounding the car park site includes low density residential (R2), medium density residential (R3), local centre (B2), public recreation (RE1) and infrastructure (SP2).

The Proposal is located on cleared land on a parcel of land west of Schofields Station and south of Schofields Road. Access to the site of the Proposal would be from Bridge Street, Schofields Road (Figure 6) and Altrove Boulevard (Figure 7). There is an existing Stockland Altrove Sales and Information Centre located in the north east corner of the Proposal site (Figure 8). Figure 9 shows the local context of the site of the Proposal.

Figure 5 Existing at-grade parking west of Schofields Station

Figure 6 Schofields Road looking east to the Richmond Line rail overbridge

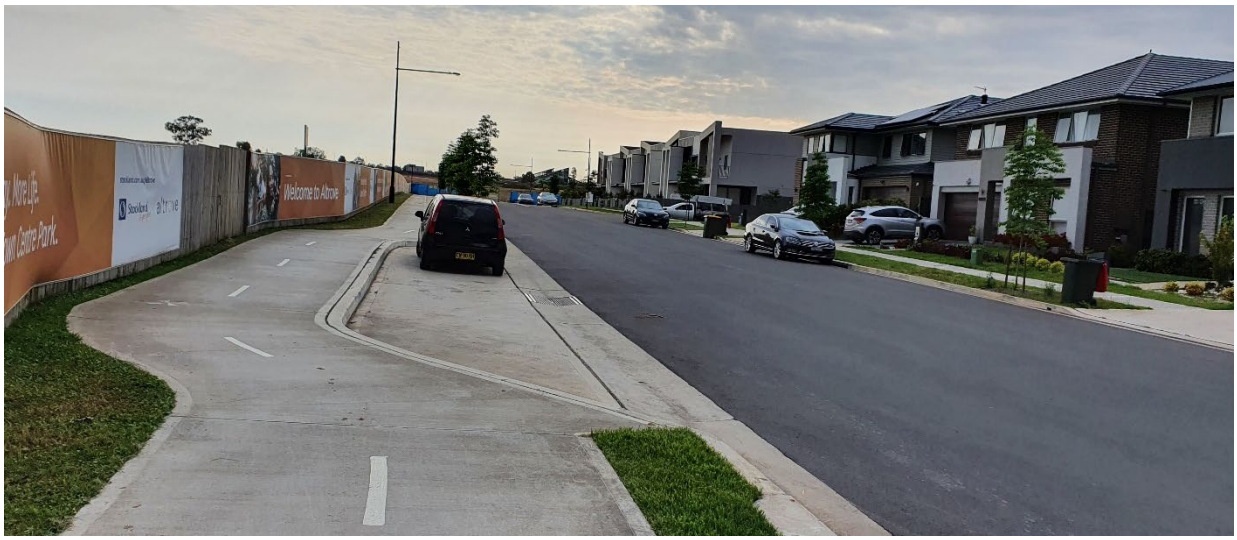
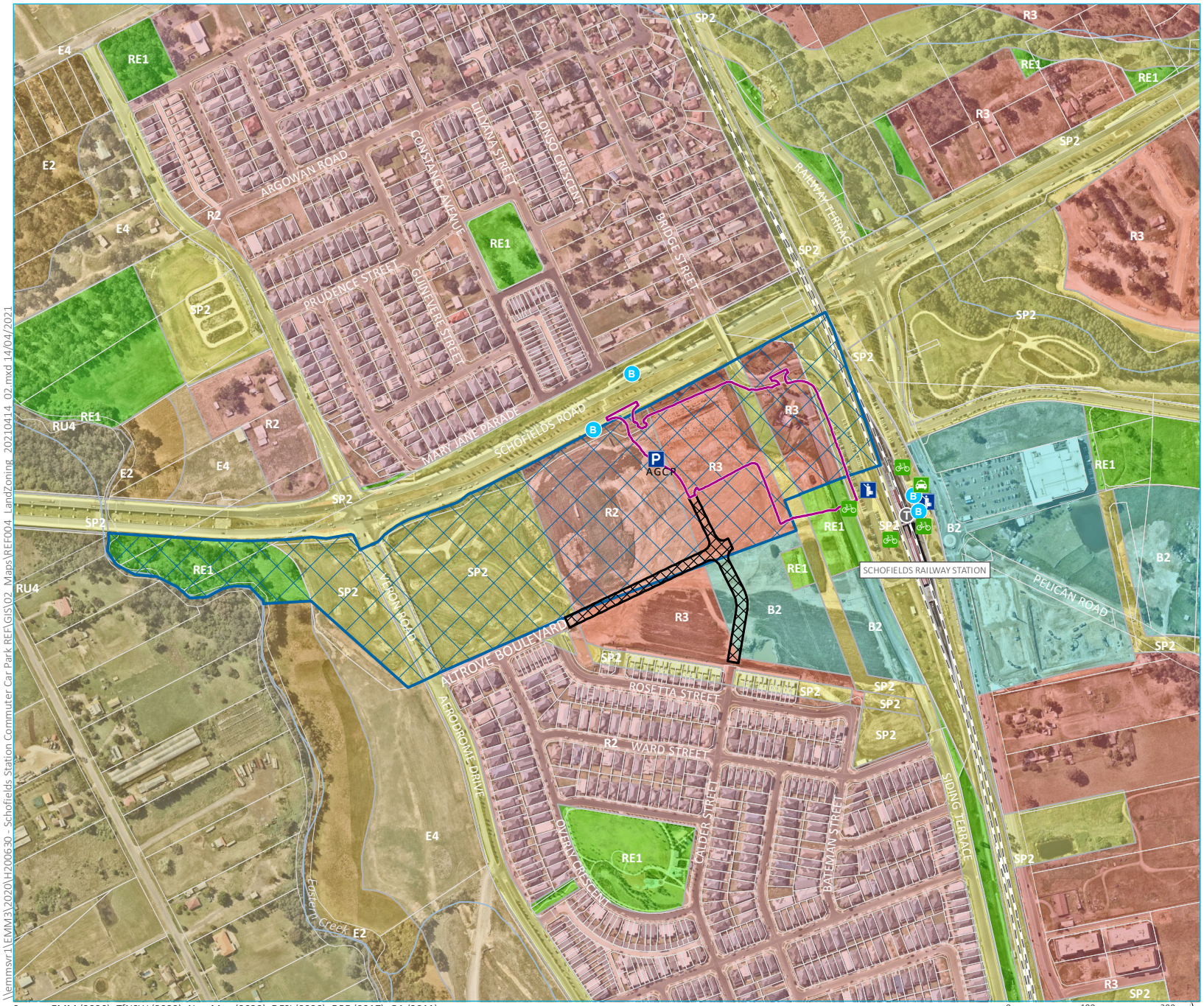


Figure 7 Altrove Boulevard looking east

Figure 8 Stockland Altrove Sales and Information Centre



KEY

- Proposal site
- Altrove Boulevard/ Calder Street extension
- Train station
- Rail line
- Watercourse/drainage line
- Cadastral boundary
- Transport corridor investigation area

Transport zone

- AGCP At grade car park
- Existing bike facilities
- Existing bus dtop
- Existing kiss & ride zone
- Existing taxi zone
- Proposed car park site

Land zone

- B2 Local Centre
- E2 Environmental Conservation
- E4 Environmental Living
- R2 Low Density Residential
- R3 Medium Density Residential
- RE1 Public Recreation
- RU4 Primary Production Small Lots
- SP2 Infrastructure

Source: EMM (2020); TfNSW (2020); NearMap (2020); DFSI (2020); DPE (2017); GA (2011)

0 100 200 m

GDA 1994 MGA Zone 56

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Site locality and land use zones

Review of environmental factors
Transport for New South Wales
Figure 9

EMM
creating opportunities

1.5 Purpose of this Review of Environmental Factors

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

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

This assessment has also considered the relevant provisions of other relevant environmental legislation, including the *Biodiversity Conservation Act 2016* (BC Act), *National Parks and Wildlife Act 1974* (NPW 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 Environment and Energy for any necessary approvals under the EPBC Act. Refer to Chapter 4 for more information on statutory considerations.

2 Need for the Proposal

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

2.1 Strategic justification

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

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

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

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

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

Policy / Strategy	Overview	How the Proposal aligns
Future Transport 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 connectivity and 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 reducing the number of cars on the roads, resulting in less emissions.
Disability Inclusion Action Plan (2018-2022) (Transport for NSW, 2017a)	The *Disability Inclusion Action Plan 2018-2022* was developed by Transport for NSW in consultation with the Accessible Transport Advisory Committee, which consists of representatives from peak disability and ageing organisations within NSW. The Disability Plan identifies the challenges, the achievements to date, the considerable undertaking that is required to finish the job and provides a solid and practical foundation for future progress over the next five years.	As part of the Proposal, 15 accessible spaces would be provided. The pathways connecting the car park to nearby bus stops and Schofields Station would also be made accessible. Elevators and an accessible pedestrian overbridge at the station connect the car park to the Woolworths shopping centre on the eastern side of the railway.
A Metropolis of Three Cities - Greater Sydney Region Plan (Greater Sydney Commission, 2018a)	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. Schofields is located in the Western Parkland City. The plan is designed to complement *Future Transport 2056 and State Infrastructure Strategy* by aligning land use, transport and infrastructure planning. It aims to reshape Greater Sydney as three unique but connected cities. The Plan provides information on the strategies to meet the needs of a growing and changing population.	The Proposal particularly supports Direction 6 of the Three Cities 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 Schofields Station and to the planned Woolworths shopping centre on the eastern side of the railway.

Policy / Strategy	Overview	How the Proposal aligns
Central City District Plan (Greater Sydney Commission, 2018b)	The Central City District Plan applies to the Blacktown, Cumberland, Parramatta and The Hills LGAs. 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.	Schofields is identified as a local centre and a Transit Oriented Development precinct under the Central City District Plan, which requires infrastructure to support future development. Of the 22 planning priorities identified in the District Plan, the Proposal particularly supports the following: • Planning Priority C1: Planning for a city supported by infrastructure • Planning Priority C9: Delivering integrated land use and transport planning and a 30-minute city.
Building Momentum – State Infrastructure Strategy 2018-2038 (Infrastructure NSW, 2018)	The *State Infrastructure Strategy 2018-2038* makes recommendations for each of NSW's key infrastructure sectors including transport. The strategy sets out the Government's priorities for the next 20 years, and combined with the *Future Transport 2056*, the Greater Sydney Region Plan and the Regional Development Framework, brings together infrastructure investment and land-use planning for our cities and regions.	The Proposal supports investment in rail infrastructure and aligns with the need to continue to provide urban public transport to support Sydney's increasing population. The Proposal is also consistent with overall aims and objectives of the *Future Transport 2056* to improve transport infrastructure across NSW.
NSW: Premier Priorities (NSW Government, 2020)	The NSW Government has identified 12 Premier's Priorities and 18 State Priorities that are focused on growing the NSW economy, delivering infrastructure, protecting the vulnerable and improving health, education and public services across the State.	The Proposal would assist in meeting the key priority to develop well connected communities with quality local environments. Achieved by investing in transport infrastructure, improving connectivity to public transport and encouraging greater use of public transport.
Schofields Precinct Plan (Department of Planning, Industry and Environment, 2020a)	The Precinct Plan describes new planning controls and infrastructure works required to enable urban development in Schofields as part of the North West Priority Growth Centre.	The Proposal is located on land identified as a Transport Corridor Investigation Area and zoned residential (R2/R3) under the Precinct Plan.

2.2 Objectives of the Commuter Car Park Program

Transport for NSW is committed to delivering accessible public transport infrastructure, which is why Transport for NSW are providing more commuter car parks through the Commuter Car Park Program. The Commuter Car Park Program is a NSW Government initiative to provide a better experience for public transport customers by delivering accessible, modern, secure and integrated transport infrastructure.

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

Table 2 Objectives of the Commuter Car Park Program

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

2.3 Objectives of the Proposal

The specific objectives of the Schofields Commuter Car Park are to provide:

- additional commuter parking in close proximity to Schofields Station to service increasing demand
- improved accessibility to transport linkages for employment and recreation
- improve integration with surrounding precinct
- improve customer safety
- improve customer amenity
- maintain pedestrian links to Schofields Station, bus stops on Schofields Road and Railway Terrace.

2.4 Alternative options considered

Investigations were undertaken to identify a potential design for additional commuter car parking near Schofields Station. Options considered for the Proposal are outlined below.

2.4.1 Option 1 – At-grade Commuter Car Park

An at-grade car park option on a cleared parcel of land west of Schofields Station and south of Schofields Road would allow for approximately 700 additional commuter car parking spaces to service Schofields Station.

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

2.4.2 Option 2 – Multi-storey Commuter Car Park near town centre

A multi-storey commuter car park option on a cleared parcel of land west of Schofields Station and south of Schofields Road would allow for approximately 700 additional commuter car parking spaces to service Schofields Station.

This option was discounted due to the potential impacts on the future town centre. A multi-storey option would be less flexible should the car park need to be modified or adapted around longer term, future transport developments, such as the proposed metro rail link or other developments in the precinct.

2.4.3 Option 3 – Multi-storey Commuter Car Park in eastern retail precinct

A multi-storey commuter car park option on a cleared parcel of land east of Schofields Station in the retail precinct would allow for approximately 700 additional commuter car parking spaces to service Schofields Station.

This option was discounted as the land was earmarked for a future retail development and therefore no longer available.

2.4.4 Option 4 – The ‘do-nothing’ option

Under a ‘do-nothing’ option, the additional 700 spaces would not be provided. There are 352 available formalised commuter parking spaces in the vicinity of the station. Previous surveys have estimated that this capacity is exceeded by some 600 vehicles during peak demand periods. 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 Schofields community.

2.4.5 Assessment of identified options

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

2.5 Justification for the preferred option

The need for providing additional commuter car parking in the vicinity of Schofields Station is considerable. The commuter parking demand around Schofields Station exceeds the existing car parking facilities by as much as 600 spaces (noting that surveys were conducted prior to the COVID-19 pandemic).

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.

Both options were considered with the needs of Transport customers, the local community and future residents of Schofields in mind and the provision of an at-grade car park at the site was the preferred option.

The Proposal is considered the best outcome for commuters and future residents of the Schofields suburb as it would address the parking shortage in the immediate vicinity of Schofields Station and increase commuter connectivity to the greater Sydney area.

3 Proposal description

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

3.1 The Proposal

As described in Chapter 1, the Proposal involves the delivery of an at-grade commuter car park in the vicinity of Schofields Station as part of the Commuter Car Park Program which would improve accessibility and amenities for customers.

The Proposal would include the following key elements:

- enabling works including road modifications and removal of the Altrove Sales and Information Centre
- an at-grade car park with approximately 700 commuter car parking spaces including five accessible spaces and dedicated motorcycle parking
- conversion of 15 general parking spaces into 10 accessible spaces within the existing commuter car park on Bridge Street, outside the station
- a new accessible path from the car park to Schofields Station
- CCTV, lighting and wayfinding
- landscaping in and around the car park
- Transport Park&Ride infrastructure (i.e. Opal card activated boom gates)
- provision for future electric vehicle charging spaces
- a new Endeavour Energy 11kV substation (1000 kVA rating) and low voltage power distribution system
- ancillary works including services relocation and/or adjustments, including lighting and communications systems (e.g. CCTV), stormwater drainage, retaining walls, and overhead wiring

The Proposal would provide access and egress from:

- Calder Street off Schofields Road
- Calder Street from Altrove Boulevard
- Bridge Street

The extension of Calder Street, south of the Proposal, and Altrove Boulevard would be undertaken by Stockland. This work is expected to be complete at the time of the car park opening, however access to the car park has been assessed under the below two scenarios in the event Stockland's work is delayed. They are as follows:

- Scenario 1 – Altrove Boulevard and Calder Street completed and operational plus access/egress via Schofields Road and left in/left out from Bridge Street; and
- Scenario 2 – Altrove Boulevard and Calder Street incomplete, access/egress via Schofields Road and left in/left out from Bridge Street only.

Figure 10 shows the general layout of key elements for the Proposal.

It is noted that Altrove Boulevard and Calder Street would be extended by a third party (Stockland) prior to construction of the car park commencing. As such, these activities are not included in the scope of the Proposal.

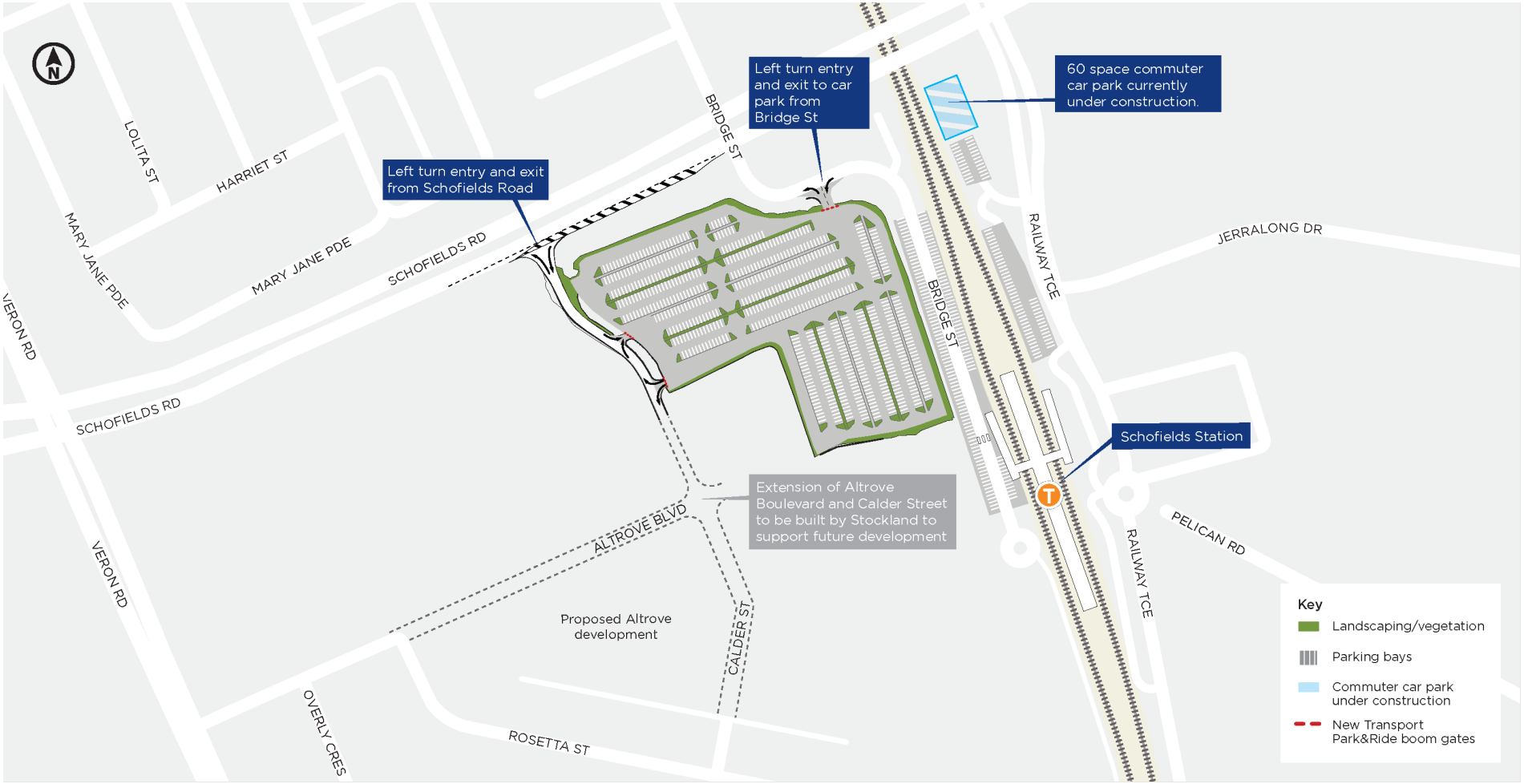


Figure 10 Key features of the Proposal

3.2 Scope of works

3.2.1 Commuter car park

The Proposal involves the provision of additional commuter car parking for Schofields Station as part of the Commuter Car Park Program. The Proposal involves the construction and operation of an at-grade commuter Transport Park&Ride car park with approximately 700 commuter car spaces which is accessed from Schofields Road, Bridge Street and Altrove Boulevard/Calder Street.

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

- 90-degree angle parking for approximately 700 car park spaces, including five accessible spaces
- 15 car spaces in the existing station car park would be converted to ten accessible car spaces
- additional motorcycle parking spaces
- two-way circulation roads around the perimeter of the site
- car park, aisles and circulation road pavements would be asphalt
- concrete kerbs would be provided around all edges of asphalt pavement
- wheel stops would be provided in all car park spaces
- two-way, single-lane entry and two-lane exit from Schofields Road. The design proposes to reuse the existing intersection on Schofields Road, including the auxiliary deceleration and acceleration lanes
- two-way, single-lane entry and exit from Calder Street off Altrove Boulevard. The link road would connect to the existing Altrove Boulevard stub road
- one-way, one-lane vehicle entry from Bridge Street, using the existing Stockland Altrove sales centre driveway
- 1.5 metre-wide concrete footpaths along the west edge of all islands in between car parks, on the outside edge of all circulation roadways, and to connect the car parking spaces to Schofields Station
- new/upgraded wayfinding signage and provision of the statutory/regulatory signage
- pedestrian path and landscaped verge around the perimeter, including provision for screening trees
- provide a raised driveway crossing at the car park entry on Schofields Road to enable safe pedestrian/cycle movement along shared path
- services relocation and/or adjustments, including lighting and communications systems (e.g. CCTV), stormwater drainage and retaining walls
- provision of power supply, which could include the installation of a new Endeavour Energy 11kV padmount substation, earthing/bonding provisions and a low voltage power distribution system (specific power requirements to be determined during detailed design)
- temporary site compounds for storage of materials and equipment

- temporary works (where required) during construction in order to maintain existing pedestrian 'level of service', such as access provisions and temporary footbridge
- decommissioning of temporary construction facilities and site demobilisation.

3.2.2 Ancillary works

Changes to Schofields Road

The design proposes to reuse the existing intersection on Schofields Road, including the auxiliary deceleration and acceleration lanes. The existing pavement markings (chevrons) on Schofields Road would require removal and the existing bus zone in the acceleration lane would need to be relocated. The existing shared path and kerb line along Schofields Road would need to be realigned to allow for the deceleration/acceleration lane.

Altrove Boulevard/Calder Street extension

Altrove Boulevard and Calder Street are currently incomplete stub streets. The Altrove Boulevard and Calder Street extensions would be completed by Stockland at the same time, or before completion of the Transport for NSW works.

Drainage

Stormwater drainage works would be provided for the car parking spaces and pedestrian paths, which would connect into existing Council drainage systems.

Swale drains would be provided on the eastern side of car parking area to collect pedestrian path runoff and raingardens to manage water quality.

A culvert crossing at the entry and exit between Schofields Road and the commuter car park would also be provided.

Fencing

Fencing for the security and management of commuter vehicles would be provided around the perimeter of the new commuter car park. A new gate would be provided on Siding Terrace for pedestrian access between the station and car park.

3.2.3 Materials and finishes

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

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

The design would be submitted to Transport for NSW's Design Review Panel at various stages for comment before being accepted by Transport for NSW. An Urban Design and Landscape Plan (UDLP) and Public Domain Plan (PDP) would also be prepared by the contractor, prior to finalisation of detailed design for endorsement by Transport for NSW.

3.3 Design development

3.3.1 Engineering constraints

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

- **earthworks:** the design is based on assumed earthwork slope angles of 3:1 (horizontal to vertical). Existing ground conditions may require flatter earthwork slopes or increased retaining walls.
- **electrical:** the installation of the new 11kV padmount substation may require ancillary upgrades to Endeavour Energy's high voltage network.
- **urban design and architecture:** an accessible route between the car park and Schofields Station would be provided to comply with the *Disability Discrimination Act 1992*. 15 temporary parking spaces to the west of the existing pedestrian path would be removed as part of the Proposal.
- **drainage:** proposed pit and pipe drainage system may not have sufficient fall to outlet into the Council drainage system. Drainage capacity would need to be confirmed prior to the commencement of construction.
- **geotechnical:** depth to bedrock and the presence/extent of contamination on site would need to be confirmed prior to the commencement of works. Contamination risks are assumed to be low given previous land uses on the site.

3.3.2 Design standards

The Proposal would be designed having regard to the following:

- *Disability Standards for Accessible Public Transport 2002* (issued under the Commonwealth *Disability Discrimination Act 1992*)
- Building Code of Australia
- relevant Australian Standards
- Asset Standards Authority standards
- Sydney Trains standards
- *NSW Sustainable Design Guidelines – Version 4.*0 (Transport for NSW, 2019a)
- *Guidelines for the Development of Public Transport Interchange Facilities* (Ministry of Transport, 2008)
- Crime Prevention Through Environmental Design (CPTED) principles
- other Transport for NSW policies and guidelines
- Blacktown City Council standards where relevant.

3.3.3 Sustainability in design

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

- energy and greenhouse gases
- climate resilience

- materials and waste
- biodiversity and heritage
- water
- pollution control
- sustainable procurement
- community benefit.

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

3.4 Construction activities

3.4.1 Work methodology

Subject to approval, construction is expected to take 12 months, commencing in mid-2021 and is expected to be completed in mid-2022. The construction methodology would be further developed during the detailed design of the Proposal by the nominated contractor in consultation with Transport for NSW.

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

Table 3 Indicative construction staging for key activities

Stage	Activities
Site establishment and enabling works	• secure site perimeter boundary with temporary fencing • undertake survey to identify site boundary and mark out existing services • establish site office, amenities and plant/material storage areas • establish other environmental controls, such as erosion and sediment controls • road modifications to Schofields Road and Altrove Boulevard/Calder Street • removal of the Altrove Sales and Information Centre
Relocation of services and preparation of substructure	• identification of services for protection or relocation • relocation or protection of services
Construction of commuter car park	• excavation of topsoil and preparation of sub-base layer • removal of existing Stockland Altrove Sales and Information Centre • place and compact sub-base layer to ensure meets geotechnical requirements • place and compact base layer • prepare kerb, guttering and install drainage • place and compact asphalt layer for car park including entry and exit points • construction of pedestrian access paths and car park entry • line marking, installation of lighting and landscaping

Stage	Activities
Testing and commissioning	• various activities to test and commission power supply and lighting
Decommissioning of temporary facilities and site demobilisation	• decommissioning of temporary construction facilities and site demobilisation • removal of footpath/pedestrian management and traffic controls • removal of environmental control measures • site clean-up and tidying works

3.4.2 Plant and equipment

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

- trucks
- generator
- bobcat
- hand tools
- mulcher
- chainsaw
- excavator (with auger)
- crane (20 tonne)
- concrete helicopter (smoothing out concrete)
- rattle gun
- lighting towers
- vibratory roller
- demolition saw
- jack hammer
- grinder
- continuous flight auger rig
- concrete truck and agitator
- concrete pump
- mobile crane
- small mobile crane
- hand-held soil compactor or Wacker rammer
- nail gun
- scissor lift
- paving machine
- coring machine
- grinder
- stump grinder
- elevated working platform

3.4.3 Working hours

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

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

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

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

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

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

The Order extends the standard construction hours to allow infrastructure construction work on Saturday, Sunday and Public holidays (7am to 6pm), without the need for any approval (excluding high noise generating works such as rock breaking or pile driving and the like).

These extended working hours were due to expire on 25 March 2021. However, on Wednesday 24 March 2021, the NSW Government introduced the *COVID-19 Legislation Amendment (Emergency Measures) Bill 2020*, which was subsequently passed by parliament, and came into effect on 25 March 2021. A section of the Bill enabled the extension of the extended working hours until 31 March 2022.

Whilst no further approvals are required for these extended working hours, in the event that Transport for NSW would seek to utilise the extended working hours permitted by the Order, advance notification would be provided to the community.

Whilst consideration of the additional working hours permitted under the Order does not require additional assessment under the EP&A Act, in the event that these additional working hours are utilised during the construction of the Schofields Commuter Car Park, the associated mitigation measures required under the TfNSW *Construction Noise and Vibration Strategy* (2019) which would normally apply to working outside of standard construction hours would be applied.

3.4.4 Extended Working Hours during COVID-19

The Minister for Planning and Public Spaces has made a number of Orders under Section 10.17 of the *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 No. 2) Order 2020* (the 'Order'), which commenced on 24 December 2020, and is applicable to construction activities for projects which have been subject to an assessment under Division 5.1, or approval under Division 5.2 of the EP&A Act. The Order extends the standard construction hours to allow infrastructure construction work on Saturday, Sunday and Public holidays (7am to 6pm), without the need for any approval (excluding high noise generating works such as rock breaking or pile driving and the like).

These extended working hours were due to expire on 25 March 2021. However, on Wednesday 24 March 2021, the NSW Government introduced the *COVID-19 Legislation Amendment (Emergency Measures) Bill 2020*, which was subsequently passed by parliament, and came into effect on 25 March 2021. A section of the Bill enabled the extension of the extended working hours until 31 March 2022.

Whilst no further assessment of the environmental impacts are required for these extended working hours, in the event that Transport for NSW would seek to utilise the extended working hours permitted by the Order, advance notification would be provided to the community.

3.4.5 Earthworks

Earthworks to achieve the desired finished levels of the above ground car park would be carried out as part of the construction phase of the Proposal. Excavations and earthworks would generally be required for the following:

- piling and excavation for car park foundations and support structures
- tie-in works in relation to existing roads and pathways
- other minor civil works, including drainage/stormwater works, and trenching activities for underground service adjustments and relocations.

It is estimated that there would be approximately 13,000 cubic metres of material to be excavated, and 5,500 cubic metres of material for filling purposes, creating a surplus of about 7,500 cubic metres of spoil to be removed off site.

3.4.6 Source and quantity of materials

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

3.4.7 Traffic access and vehicle movements

For construction vehicle site access, it is proposed that during enabling works, road modifications to Schofields Road would occur which would allow construction vehicles to enter and exit the car park footprint (left in, left out) without impacting the neighbouring community and local streets. Light vehicle access only would be provided off Bridge Street during the initial stages of the project (refer to Figure 12).

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:

- construction vehicle movements for staff access and the delivery of materials and equipment on Bridge Street, Altrove Boulevard and Schofields Road
- construction staff parking, which would be located on the Proposal site
- temporary changes in pedestrian, cyclist and vehicle access and movements around Schofields Station.

3.4.8 Ancillary facilities

A temporary construction compound would be required to accommodate a site office, amenities, laydown and storage area for materials. Two areas for construction compounds have been proposed (refer to Figure 11):

- Near the Schofields Road entrance
- Near the Bridge Street entrance

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

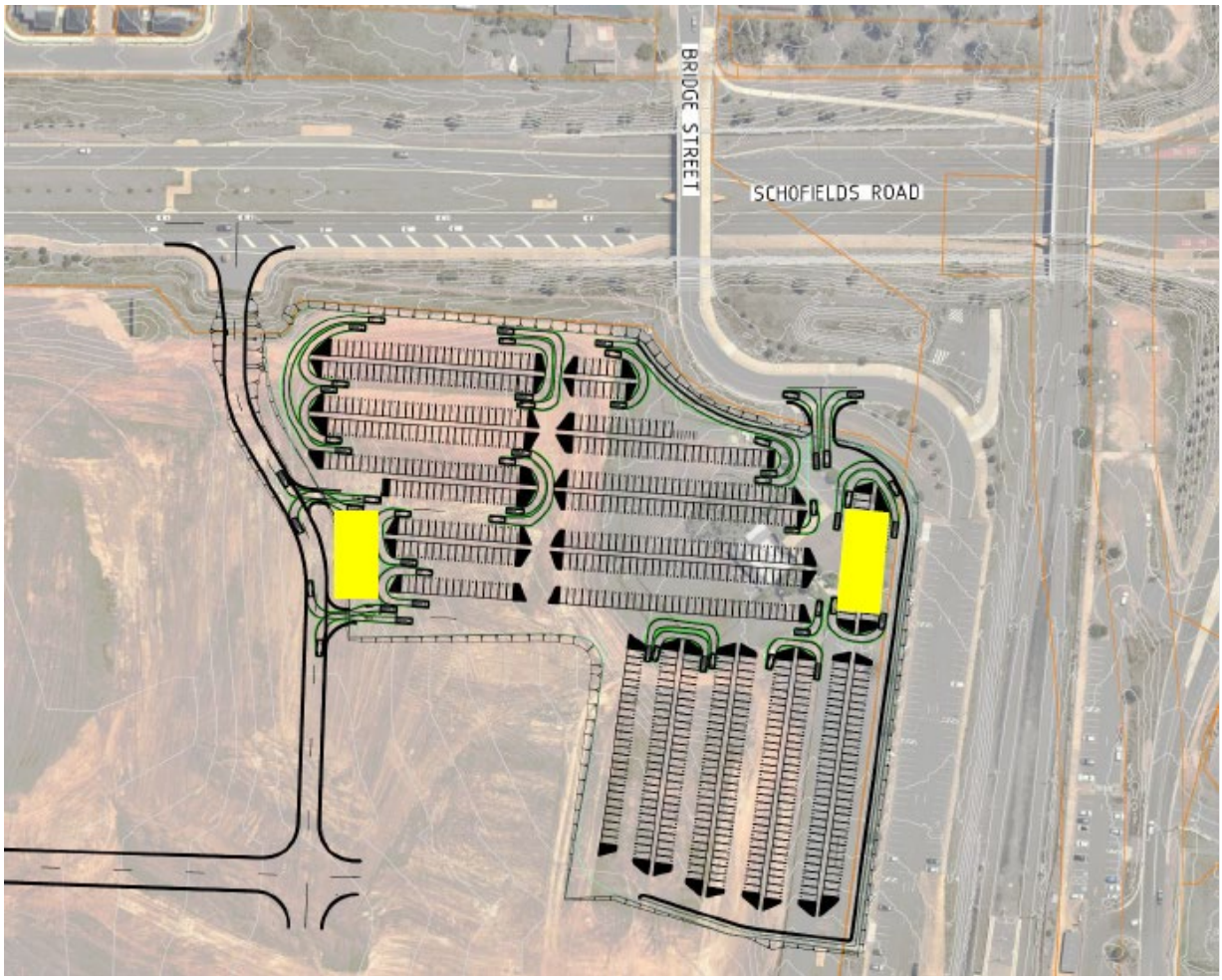


Figure 11 Proposed site compound and material laydown areas

(source: FutureRail, 2021)

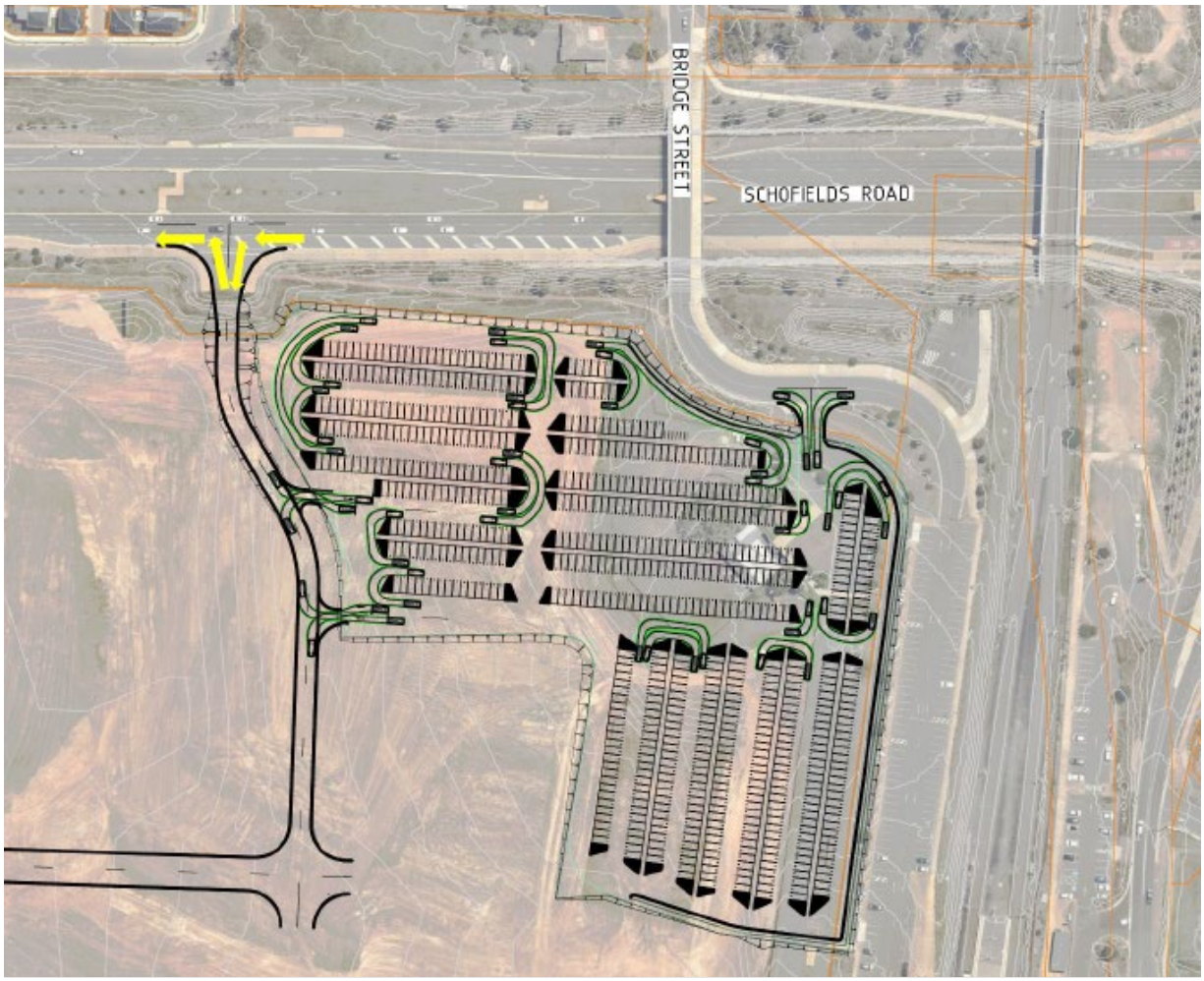


Figure 12 Construction vehicle access

(source: FutureRail, 2021)

3.4.9 Public utility adjustments

The Proposal has been designed to avoid relocation of services where feasible, however further investigation may be required. It is likely some services may require protection or relocation, but such relocation is unlikely to occur outside of the footprint of the works assessed in this REF. Should public utility adjustments be required outside of this footprint, further environmental impact assessment would be undertaken. The appropriate utility providers would be consulted during the detailed design phase.

3.5 Property acquisition

The Proposal site is currently owned by Stockland. TfNSW is currently in the process of acquiring this land from Stockland (Lot 12 DP1256003).

3.6 Operation and maintenance

The future operation and maintenance of the car park is subject to further discussions with Sydney Trains, Transport for NSW and Blacktown City Council. Infrastructure provided under this Proposal would be maintained by Sydney Trains. However, it is expected that adjacent garden/landscape areas would continue to be maintained by Blacktown City Council.

4 Statutory considerations

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

4.1 Commonwealth legislation

4.1.1 Environment Protection and Biodiversity Conservation Act 1999

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

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

4.1.2 Other Commonwealth legislation

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

Table 4 Other Commonwealth legislation applicable to the Proposal

Applicable legislation	Considerations
Aboriginal and Torres Strait Islander Heritage Protection Act 1984	There is an obligation on a person who discovers anything which he or she has reasonable grounds to suspect are Aboriginal remains to report that discovery to the Minister, giving particulars of the remains and their location. The Proposal does not include any active sites of Aboriginal remains (refer Section 6.4); however, considerations for unexpected finds are further detailed in mitigation measures and applies to this Act.
Disability Discrimination Act 1992 (DDA)	This Act aims to eliminate as far as possible, discrimination against persons on the ground of disability in areas including access to premises and the provision of facilities, services and land. The Proposal would be designed having regard to the requirements of this Act. The key objective of the Proposal is to improve the accessibility of Schofields Station which is consistent with the objectives of this Act.

4.2 NSW legislation and regulations

4.2.1 Transport Administration Act 1988

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

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

2A Objects of Act

…

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

b) to promote the integration of the transport system,

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

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

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

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

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

…

(a) ***Environmental sustainability***

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

(b) ***Social benefits***

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

4.2.2 Environmental Planning and Assessment Act 1979

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

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

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

4.2.3 Other NSW legislation and regulations

Table 5 provides a list of other relevant legislation applicable to the Proposal.

Table 5 Other legislation applicable to the Proposal

Applicable legislation	Considerations
Biodiversity Conservation Act 2016 (BC Act) (NSW)	The site does not contain suitable habitat for any listed threatened species or community and is unlikely to have a significant impact on any threatened species or community (refer Section 6.6).

Applicable legislation	Considerations
Biosecurity Act 2015 (NSW)	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 Blacktown LGA are identified (refer to Section 7).
Contaminated Land Management Act 1997 (CLM Act) (NSW)	Section 60 of the CLM Act imposes a duty on landowners to notify the NSW Department of Planning, Industry and Environment (formerly Office of Environment and Heritage (OEH)), and potentially investigate and remediate land if contamination is above EPA guideline levels. The site has not been declared under the CLM Act as being significantly contaminated (refer Section 6.7).
Crown Lands Act 1987 (NSW)	The Proposal does not involve works on Crown land.
Disability Discrimination Act 1992 (DDA Act) (Commonwealth)	The Proposal would be designed having regard to the requirements of this Act.
Heritage Act 1977 (Heritage Act) (NSW)	No listed heritage items are located on or near the Proposal. No approvals or permits under sections 57, 60, 139 or 140 are required.
Land Acquisition (Just Terms Compensation) Act 1991	Property acquisition would need to be managed in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*.
National Parks and Wildlife Act 1974 (NPW Act) (NSW)	Sections 86, 87 and 90 of the NPW Act require consent from NSW Department of Planning, Industry and Environment (formerly OEH) for the destruction or damage of Indigenous objects. The Proposal is unlikely to disturb any Indigenous objects (refer Section 6.13). However, if unexpected archaeological items or items of Indigenous heritage significance are discovered during the construction of the Proposal, all works would cease and appropriate advice sought.
Protection of the Environment Operations Act 1997 (PoEO Act) (NSW)	The Proposal does not involve a 'scheduled activity' under Schedule 1 of the PoEO Act. Accordingly, an Environment Protection Licence (EPL) is not required for the Proposal. However, in accordance with Part 5.7 of the PoEO Act, Transport for NSW would notify the EPA of any pollution incidents that occur onsite. This would be managed in the CEMP to be prepared and implemented by the contractor.
Roads Act 1993 (Roads Act) (NSW)	Section 138 of the Roads Act requires consent from the relevant road authority for the carrying out of work in, on or over a public road. However, clause 5(1) in Schedule 2 of the Roads Act states that public authorities do not require consent for works on unclassified roads. The construction contractor would obtain any necessary approvals or licences from the relevant roads authority (Council or Transport for NSW) under the Roads Act for kerb realignment, and changes to linemarking and signage proposed in Schofields Road and Bridge Street.
Sydney Water Act 1994 (NSW)	The Proposal would not involve discharge of wastewater to the sewer.

Applicable legislation	Considerations
Waste Avoidance and Resource Recovery Act 2001 (WARR Act) (NSW)	Transport for NSW would carry out the Proposal having regard to the requirements of the WARR Act. A site-specific Waste Management Plan would be prepared.
Water Management Act 2000 (NSW)	The Proposal would not involve any water use (from a natural source e.g. aquifer, river – only from the network), water management works, drainage or flood works, controlled activities or aquifer interference.

4.2.4 State Environmental Planning Policies

State Environmental Planning Policy (Infrastructure) 2007

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

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.

Part 2 of the Infrastructure SEPP contains provisions for public authorities to consult with local councils and other agencies prior to the commencement of certain types of development. Section 5.3 of this REF discusses the consultation undertaken under the requirements of the Infrastructure SEPP.

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

State Environmental Planning Policy 55 – Remediation of Land

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

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

Impacts of contaminated lands and potential remediation are in Section 6.7.

State Environmental Planning Policy (Sydney Region Growth Centres) 2006

The *State Environmental Planning Policy (Sydney Region Growth Centres) 2006* (Sydney Region Growth Centres SEPP) aims to co-ordinate the release of land for residential, employment and other urban development in the North West Priority Growth Area, the South West Priority Growth Area, the Wilton Growth Area and the Greater Macarthur Growth Area. Schofields is part of the North West Priority Growth Area identified in the SEPP.

The planning provisions prescribed by the Sydney Growth Centres SEPP apply in place of a Local Environmental Plan. Although the Infrastructure SEPP prevails over the Sydney Region Growth Centres SEPP, the provision of the Sydney Region Growth Centres SEPP have been considered in design development.

4.2.5 Blacktown Local Environmental Plan 2015

The Proposal is located within the Blacktown LGA. The Infrastructure SEPP prevails over all other environmental planning instruments (such as LEPs) except where there is an inconsistency with *State Environmental Planning Policy (State Significant Precincts) 2005* or certain provisions of *State Environmental Planning Policy (Coastal Management) 2018.*

Because of the effect of the Schofields Precinct Plan (refer to Table 1), which was prepared by Department of Planning, Industry and Environment under the Sydney Growth Centres SEPP, the *Blacktown Local Environmental Plan 2015* does not include land use zones for the Proposal site.

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 Schofields Commuter Car Park. Section 3.3.3 summarises how ESD would be incorporated in the design development of the Proposal. Sections 6.10 and 6.11 include an assessment of the Proposal on climate change and sustainability, and Section 7.2 lists mitigation measures to ensure ESD principles are incorporated during the construction phase of the Proposal.

5 Community and stakeholder consultation

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

5.1 Early engagement

In late 2020, Transport for NSW sought feedback from the community and Blacktown City Council on a proposal for a new ground level commuter car park to the west of Schofields Station. A concept design for the proposal was shared with the community for feedback over a three-week period.

Consultation activities during this period included newsletters distributed to local residents, signage installed at the station and in surrounding commuter car parks, doorknocks to local residents and a livestream was hosted by the project team outlining the proposal and providing an opportunity for the community to provide feedback and submit questions. During the feedback period a follow up notification was provided to the community answering commonly asked questions. During the feedback period approximately 110 community submissions were received.

Following community consultation on the proposed concept design, discussions with the current landowner (Stockland) progressed and a revised footprint was selected. Community consultation on the revised footprint occurred in March and April 2021. During this feedback period, approximately 105 submissions were received, these are summarised and addressed in Section 5.5.

5.2 Stakeholder consultation

5.2.1 Consultation with Blacktown City Council

Blacktown City Council were briefed in December 2020 on the original proposal and again in April 2021 on the revised footprint. Council provided the following feedback on the revised concept design presented to them in April 2021:

- Council noted the importance of the Calder Street and Altrove Boulevard entry and exit to the car park
- Council requested shared user paths be incorporated into the design and construction of the extensions of Calder Street and Altrove Boulevard
- Council requested the final design of the car park include tree planting to address heat island effect

5.2.2 Consultation with Stockland

Throughout the planning phase for the Proposal, Transport for NSW has been in discussions with Stockland to acquire land for the Proposal. The below section summarises key matters have that have been discussed in relation to the Proposal:

- Lot size necessary for providing 700 car spaces and requiring acquisition
- Surveying and valuation for acquisition
- Traffic access to and from the car park as well access for any potential future development in the area
- Provision of future connectivity for roads and services

- Consideration of future town centre and Stockland's staged development for housing
- General pedestrian access to and from the station and from the car park
- Any future design and construction interfaces if Proposal was to proceed
- Timing of car park delivery and Stockland's proposed extension of Calder Street and Altrove Boulevard.

Engagement with Stockland would continue throughout detailed design and construction.

5.3 Consultation requirements under the Infrastructure SEPP

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

Table 6 provides details of consultation requirements under the Infrastructure SEPP for the Proposal.

Table 6 Infrastructure SEPP consultation requirements

Clause	Clause particulars	Relevance to the Proposal
Clause 13 | Consultation with Councils – development with impacts on council related infrastructure and services	Consultation is required where the Proposal would result in: • substantial impact on stormwater management services • generating traffic that would place a local road system under strain • involve connection to or impact on a council owned sewerage system • involve connection to and substantial use of council owned water supply • significantly disrupt pedestrian or vehicle movement • involve significant excavation to a road surface or footpath for which Council has responsibility.	The Proposal includes works that would: • require connections or impacts the stormwater system • disrupt pedestrian and vehicle movements • impact on road pavements under Council's care and control (Altrove Boulevard) • impact on Council-operated footpaths. Consultation with Blacktown 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 or a heritage conservation area. Accordingly, consultation with Council is not required. Refer to Section 6.13.
Clause 15 | Consultation with Councils – development with impacts on flood liable land	Where railway station works: • impact on land that is susceptible to flooding – reference would be made to *Floodplain Development Manual: the management of flood liable land.*	The Proposal is located adjacent to a Council flood detention basin, however the Proposal site does not extend into the flood liable land. Accordingly, consultation with Council is not required in regard to this aspect. Refer to Section 6.8.

Clause	Clause particulars	Relevance to the Proposal
Clause 15A Consultation with Councils – development with impacts on certain land within the coastal zone	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.	Schofields Commuter Car Park is not located on land within a coastal vulnerability area.
Clause 15AA Consultation with State Emergency Service – development with impacts on flood liable land	Where railway station works: • impact on flood liable land -written notice must be given (together with a scope of works) to the State Emergency Services and taken into consideration any response to the notice received from the State Emergency Service within 21 days after the notice is given.	The Proposal is not located on flood liable land and therefore consultation with Council is not required in regard to this aspect.
Clause 16 | Consultation with public authorities other than Councils	For *specified development* which is: • adjacent to land reserved under the *National Parks and Wildlife Act 1974* • on land in Zone E1 or an equivalent land use zone • Adjacent to an aquatic reserve or marine park • In the Sydney Harbour Foreshore area • a fixed or floating structure in or over navigable waters • on land within the dark sky region • on defence communications facility buffer land • on land in a mine subsidence district.	The Proposal is not located on land that would trigger any of the items under Clause 16. Accordingly, consultation with the Heritage NSW or other authorities on this matter is not required.
Clause 104 | Consultation with relevant roads authority	For traffic-generating development specified in Column 1 of the Table to Schedule 3 that involves new premises of the relevant size or capacity, or an enlargement or extension of existing premises, being an alteration or addition of the relevant size or capacity – written notice of the intention to carry out the development must be given to the relevant roads authority in relation to the development. Any response to the notice that is received from the relevant roads authority within 21 days after the notice is given must be taken into consideration.	The Proposal is deemed a traffic generating development as a car park with approximately 700 car parking spaces. Accordingly, consultation with the relevant division of Transport for NSW is required in regard to this aspect. Refer to Section 6.1.

A notification letter outlining the scope of the Proposed Activity was sent to Blacktown City Council on 26 March 2021 in accordance with the consultation requirements under clause 13 of the Infrastructure SEPP, which provides Council with 21 days to provide a response.

Blacktown City Council provided a response on 16 April 2021, Table 7 outlines issues raised by Council along with Transport for NSW's response.

Table 7 Council feedback themes

No	Issues raised	Response
1	**Carpark access and safety**	
1.1	Concern the lack of traffic lights for right-turns between Calder Street and Schofields Road, has the potential to adversely impact on residents in Bridge Street and Argowan Road.	A Traffic Impact Assessment has been undertaken as part of the REF and is summarised in Section 6.1. Although right turns will not be permitted into the proposed carpark from Schofields Road, access to the carpark from suburbs to the west (e.g. Marsden Park) in the AM peak would be available via Railway Terrace. Vehicles could return to the east (e.g. The Ponds and Kellyville Ridge) in the PM peak from the carpark via Veron Road. These routes would reduce the desire for car park users to access the carpark via Bridge Street and Argowan Road from locations outside of the immediate northern catchment of the car park. Road safety audits would be undertaken during detailed design development and following the opening of the car park. The road safety audit would be provided to Council for their information. Any feasible and reasonable mitigation measures would be implemented. Consultation would occur with the relevant section of Transport for NSW to explore opportunities to optimise signal phasing at key intersections in the local traffic network to reduce impacts on intersection queuing in the area.
1.2	Concerns with the timing of Altrove Boulevard and Calder Street extension. A comprehensive wayfinding signage scheme is to be installed, to direct traffic to and from the car park via Schofields Road, Veron Road, Altrove Boulevard and Calder Street.	Altrove Boulevard and Calder Street would be constructed by Stockland as part of the development in the area. TfNSW is consulting with Stockland as part of the land purchase agreement for the timing of these works to align with the car park opening. Appropriate wayfinding signage would be provided at relevant locations along the road network surrounding the Proposal.
1.3	Request for an independent report to be provided to Blacktown City Council, to assess the traffic safety and flow impacts on Argowan Road and Bridge Street, and propose remedial actions to resolve problems identified. The report should include a safety assessment of access to the new car park from Bridge Street, and propose remedial actions to resolve problems identified.	A Traffic Impact Assessment Report has been undertaken as part of the REF and is summarised in Section 6.1. Road safety audits would be undertaken during detailed design development and following car park opening. The road safety audit would be provided to Council for their information. Any feasible and reasonable mitigation measures would be implemented.

No	Issues raised	Response
2	**Car park design**	
2.1	Request for the car park to be designed according to the requirements of the relevant standards, including AS2890.1.	The Proposal would be designed and constructed in accordance with AS2890.1 and other relevant standards.
3	**Landscaping and trees**	
3.1	Request the project implements a tree planting scheme, to reduce the urban heat island effect. A detailed tree planting and landscaping plan is to be provided to Blacktown City Council for comment.	An Urban Design and Landscape Plan would be prepared during the detailed design. The Plan would include materials and landscaping, that would be selected on the basis of sustainability principles. The detailed design process would seek to retain existing vegetation where possible, however where this cannot be achieved, any vegetation removed would be offset as per the TfNSW Vegetation Offset Guide. No less than 15% of the total car park area would be landscaped. TfNSW would continue to consult with Council throughout detailed design and construction on the proposed landscaping for the car park.
4	**Stormwater drainage**	
4.1	Blacktown City requires detailed information on stormwater drainage proposed for the new car park.	The stormwater management system would be designed in accordance with Council specifications. TfNSW would consult with Council on stormwater design prior to construction.

5.4 Consultation strategy

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

The objectives of the consultation strategy are to:

- provide accurate and timely information about the Proposal and REF process to relevant stakeholders
- raise awareness of the various components of the Proposal and the specialist environmental investigations
- ensure that the directly impacted community are aware of the project and consulted where appropriate
- provide opportunities for stakeholders and the community to express their view about the Proposal
- understand and access valuable local knowledge from the community and stakeholders
- utilise community feedback to inform the detailed design of the project

- build positive relationships with identified community stakeholders
- ensure a comprehensive and transparent approach.

5.5 Targeted consultation

The REF targeted consultation strategy adopted a range of consultation mechanisms, including:

- installation of signage at the station and in existing commuter car parks informing commuters of the Proposal and contact information to provide feedback
- distribution of a project update to surrounding residents and businesses outlining the Proposal and inviting feedback
- dedicated project webpage on Transport for NSW website that includes a summary of the Proposal and information on how to provide feedback
- geographically targeted social media post to Schofields and surrounding suburbs to inform social media users of the Proposal and link to view the plans
- email project update to project distribution list to advise the community of revised footprint and seek feedback
- consultation with Blacktown City Council and Stockland.

Community consultation activities for the Proposal were undertaken from 26 March 2021 to 11 April 2021.

The feedback received from the community regarding the Proposal during the consultation process has been categorised into the key themes in Table 8.

Table 8 Community feedback themes

No	Issues raised	Response
1	**Support**	
1.1	Supportive of the Proposal	Improving commuter parking at Schofields Station is a priority for Transport for NSW. Construction of the at-grade car park is planned to begin mid-2021 and take around 12 months to complete.
2	**Design**	
2.1	Request for multi-storey car park	Multiple options were considered before the current proposal was progressed for community feedback. These options are discussed in Section 2.4. At this stage, a new at-grade commuter car park is considered the best option in delivering much needed additional commuter parking to the community in the shortest timeframe. An at-grade commuter car park provides us the greatest flexibility should Transport for NSW need to modify or adapt the land around longer term, future transport developments, such as the proposed metro rail link or other developments in the precinct. There are currently no plans to construct a multi-storey car park at Schofields Station however the current proposal does not preclude any future plans for a multi-storey car park.

No	Issues raised	Response
2.2	Request for provision of additional parking spaces beyond the 700 spaces proposed	The car park is designed to meet current and future demand in Schofields and surrounding suburbs. The nature of the car park as at-grade facility provides the greatest flexibility should there be a need to expand or integrate it into future transport infrastructure.
2.3	Request for restricted hours of access/use of car park (day-time hours only)	The commuter car park would be operational 24 hours a day, 7 days a week. The car park would have Park&Ride facilities installed (Opal activated boom gates) to provide parking for those who want to travel on public transport. The primary goal of Park&Ride is to make sure commuter car parks are available for those using public transport, and not those who might be shopping or working locally.
2.4	Request for additional pedestrian paths to access the station	There are several pedestrian paths and crossings in the vicinity of the Proposal site. This includes a shared pedestrian and bicycle path 2.5 metres wide along the site frontage of Schofields Road and Railway Terrace, a pedestrian crossing refuge island across Schofields Road directly north of the proposal site, and the signalised intersections at Schofields Road/Railway Terrace and Schofields Road/Veron Road have pedestrian crossing facilities provided on all approaches. The Proposal maintains pedestrian connectivity throughout the car park with the provision of 1.5 metre wide pedestrian paths. The pedestrian paths are linked with pedestrian crossings on approach to station entrance. A 3 metre wide pedestrian path would provide direct connection between the car park and the station entrance. The existing and proposed pedestrian paths are considered adequate in providing connectivity to the station.
2.5	Request for grade separated (footbridge) crossing of Bridge Street/railway/Railway Terrace between car park and Woolworths	The existing station footbridge provides access across the rail corridor. A grade separated (footbridge) crossing of Bridge Street/railway/Railway Terrace between car park and Woolworths was not considered as part of this proposal.
2.6	Request for additional disabled parking spaces	The Proposal includes the conversion of 15 general parking spaces into 10 accessible spaces within the existing commuter car park on Bridge Street, outside the station entrance. An additional five accessible spaces would be provided within the new car park.
2.7	Request for additional kiss and ride spaces on western side of station	There is an existing kiss and ride area on the western side of the station within the Bridge Street car park. Additional kiss and ride spaces were not considered as part of this Proposal.

No	Issues raised	Response
2.8	Request for additional bicycle storage	There are no plans to increase bike storage as part of the concept design for the new commuter car park. There are currently bike sheds and cages at the station that have capacity. Transport for NSW would continue to monitor bike usage at the station and if required, look to increase bike storage.
2.9	Request for development of a café on the western side of the station	The provision of a café does not form part of the current Proposal scope of works.
2.10	Request for car park to be relocated to the airspace over the rail corridor with direct access to the station via vertical transport	The location for the car park was chosen as it is close to the station, provides flexibility for potential future transport infrastructure as it is zoned for transport infrastructure and has the necessary space to accommodate much needed additional commuter parking in Schofields. The Proposal would be designed and built to provide the community with much needed additional parking for many years. As Schofields is a growing area and there are plans for a proposed future metro link, the design of the car park, as an at-grade, provides us with the flexibility to adapt or modify the car park as needed around longer term, future transport developments. The current Proposal does not preclude construction of a multi-storey car park at some point in the future.
2.11	Requests north/south configuration (as opposed to L-shape) to reduce walking distances to station	The Proposal footprint is designed to fit within the future transport corridor identified in NSW Government and local council planning documents. Alternate configurations may negatively impact planning for the future town centre development proposed by Stockland.
3	**Traffic and transport**	
3.1	Request for provision of an intersection at the Schofields Road entrance which would also accommodate a right turn entry and exit	Traffic assessments have been undertaken to understand traffic flows in the area and entry and exit points. The main entry and exit point to and from the car park, and where Transport for NSW expect the majority of commuters to enter and exit, is from Schofields Road. A new right in and right out access from Schofields Road would require a new signalised intersection which would not be supported due to its close proximity to existing intersections on Schofields Road. A non-signalised intersection is not proposed due to multiple entry and exit points being a more cost-effective solution.

No	Issues raised	Response
3.2	Concerns with future traffic capacity on Altrove Boulevard	A traffic assessment was undertaken to understand traffic flows in the area and entry and exit points and assess potential impacts of the Proposal. The Traffic Impact Assessment Report found that Altrove Boulevard would exceed capacity goals for the PM peak in the 2021 and 2031 scenarios (Section 6.1). However, it should be noted that the capacity issue would arise only during the two-hour window in the PM peak where there are no conflicting movements between the residents vehicles and commuter car park users (i.e. during the AM and PM peaks, resident vehicles would generally be moving in the opposite direction to that of car park users). As discussed in Section 6.1.2, minor exceedances of the TfNSW local road capacity goals (peak hour volume of 200 vehicles/hour) are anticipated for the operational traffic modelling scenarios 2021/2031. It is also noted that with the completion of the Altrove Boulevard/Calder Street extension, the Altrove Boulevard/Veron Road intersection would perform satisfactorily within capacity, with an average delay of <14 seconds/vehicle. Overall, the Altrove Boulevard/Veron Road intersection would have additional capacity to accommodate traffic generated by the Proposal.
3.3	Request for signalisation of Calder Street/Rosetta Street intersection	Traffic generated by the proposal is not expected to warrant the need for the signalisation of Calder Street/Rosetta Street. Potential traffic impacts are discussed in Section 6.1.
3.4	Request for access from Siding Terrace to/from Bridge Street without having to pass through car park	Siding Terrace was constructed to provide access to the existing Altrove sales centre and is not designed to be a traffic thoroughfare. Consequently, this road is not suitable to be used as a public access way to the car park.
3.5	Concerns with traffic and pedestrian safety, given narrow local street widths which provide access to the car park (Altrove Boulevard, Calder Street and Bridge Street)	Pedestrian connectivity is maintained throughout the proposed car park with the provision of 1.5 m wide pedestrian paths. The pedestrian paths are linked with pedestrian crossings on approach to station entrance. A 3 m wide pedestrian path would provide direct connection between the car park and the station entrance. A Road Safety Audit would be undertaken as part of the detailed design process and on completion of construction. The need for adjustments to local streets would be considered in consultation with Blacktown City Council as part of design development. The opportunity to widen local streets may be constrained by road reserve widths.

No	Issues raised	Response
3.6	Request for removal of access to/from car park from Bridge Street	The removal of access/egress from Bridge Street would limit circulation between the existing western car park and the proposed car park. A traffic assessment has been undertaken to understand traffic flows in the area and entry and exit points and the potential impacts of the Proposal. Potential operational impacts are discussed in Section 6.1. Local traffic impacts on Bridge Street are considered in Section 6.1.2. Access to/from Bridge Street is advantageous for commuters approaching the proposed car park from the north, and those commuters who cannot find a space in the existing car park to the west of the station.
3.7	Request that the car park does not commence operations without access from Altrove Boulevard	Transport for NSW is currently discussing the timing of the Altrove Boulevard/ Calder Street extensions with Stockland. The noise and traffic impact assessments in Chapter 6 have considered the potential impacts of the proposal should access from Altrove Boulevard be unavailable at the commencement of operation. Access to/from Altrove Boulevard is advantageous, particularly for commuters approaching from suburbs to the west and south of the Proposal.
3.8	Request removal of access to/from Altrove Boulevard/Calder Street from the design	The likely distribution of traffic generation to/from Altrove Boulevard and Calder Street is considered in Section 6.1.2. Altrove Boulevard is earmarked for extension by Stockland for their future development in the area, regardless of the car park proposal. Extension of Altrove Boulevard and Calder Street to connect with Schofields Road would provide access to the growth area for the current and future residents, therefore access via Altrove Boulevard cannot be restricted.
3.9	Concerns with traffic delays associated with the existing pedestrian crossing on Railway Terrace	Adjustments to the Railway Terrace pedestrian crossing were not considered as part of the Proposal. A Road Safety Audit would be undertaken as part of the detailed design process and on completion of construction.
3.10	Concerns with intersection performance of the Railway Terrace/Woolworths entrance roundabout	Intersection performance is considered in Section 6.1.2. With the Altrove Boulevard extension completed (Case 1), no impacts on this intersection are likely as vehicles approaching from the west would be able to access the car park via Altrove Boulevard/Calder Street. As discussed in Section 6.1.2, should the Altrove Boulevard extension not proceed prior to commencement of operation (Case 2) for the operational traffic modelling scenarios 2021/2031, increases to queue lengths for the Railway Terrace/ Woolworths entrance roundabout may occur in the AM site peak of over 61 metres, however this would be temporary until the completion of the Altrove Boulevard extension.

No	Issues raised	Response
3.11	Concern with capacity of Schofields Road/Veron Road intersection	The need for adjustments to turning lane capacity and signal optimisation would be considered in consultation with Blacktown City Council as part of design development. The opportunity to extend the right turn lane on Veron Road may be accommodated with the removal of the existing median and would be further considered during detailed design.
3.12	Request for intersection upgrade and right turn lane extension at south approach to Schofields Road/Veron Road intersection	The need for adjustments to the south approach to Schofields Road on Veron Road would be considered in consultation with Blacktown City Council as part of design development. The opportunity to extend the right turn lane on Veron Road may be accommodated with the removal of the existing median and would be further considered during detailed design.
3.13	Request for extension of Aerodrome Driveway to Quakers Road, and various extensions to connect the Akuna Vista estate to the Western Sydney University campus and other streets to the south of the proposal	The key objective of the Proposed Activity is to provide an increased number of commuter parking spaces. These road extensions to the south of the site of the proposal fall outside the scope of works for this Proposal.
3.14	Request for completion of the Burdekin Road upgrade	The key objective of the Proposed Activity is to provide an increased number of commuter parking spaces. The Burdekin Road upgrade falls outside the scope of works for this proposal.
3.15	Request for one-way or contraflow arrangement on Bridge Street/Westminster Street rail overbridge	The key objective of the Proposed Activity is to provide an increased number of commuter parking spaces. A one-way or contraflow arrangement on Bridge Street/Westminster Street rail overbridge was not considered as part of this proposal. Whilst these measures would increase capacity in the direction of travel, they would significantly decrease capacity for movements in the opposing direction and lead to increased journey times for those drivers.
3.16	Request for reconfiguration of kiss and ride facility on eastern side (Railway Terrace) of the station	The key objective of the Proposed Activity is to provide an increased number of commuter parking spaces. Reconfiguration of kiss and ride facilities in Railway Terrace was not considered as part of this proposal. Plans are underway by Council to upgrade the bus interchange/kiss and ride facility. This feedback would be forwarded to Council for their consideration in the upgrade of the interchange.
3.17	Concerns with access to car park from suburbs to the west of the proposal (e.g. Marsden Park)	The likely distribution of traffic generation to/from suburbs to the west of the proposal is considered in Section 6.1. Altrove Boulevard would provide access to the car park from locations in the west via Veron Road/Altrove Boulevard. Vehicles could return via left turn at Schofields Road exit.

No	Issues raised	Response
3.18	Request for reduction/removal of commuter parking in Bridge Street (e.g. residents only parking)	Blacktown City Council is responsible for the street parking on Bridge Street. Transport for NSW would refer this request to Blacktown City Council for consideration during detailed design.
3.19	Request for traffic calming measures in Bridge Street	The need for traffic calming measures on Bridge Street would be considered in consultation with Blacktown City Council as part of design development. A Road Safety Audit shall be undertaken as part of the detailed design process and on completion of construction. The findings of the Road Safety Audit shall be provided to Blacktown Council for information.
3.20	Requests for a right turn lane on the south approach to Aerodrome Drive (Veron Road)/Altrove Boulevard intersection	The need for adjustments to the south approach to Altrove Boulevard on Aerodrome Drive would be considered in consultation with Blacktown City Council as part of design development. A right turn lane on the south approach to Aerodrome Drive is not part of the scope of works however the Proposal does not preclude the future construction of an additional turning lane to Aerodrome Drive.
3.21	Requests a right turn lane on the west approach to Aerodrome Drive (Veron Road)/Altrove Boulevard intersection	The need for adjustments to the west approach to Aerodrome Driveway on Altrove Boulevard would be considered in consultation with Blacktown City Council as part of design development. The opportunity to widen Altrove Boulevard may be constrained by road reserve widths.
3.22	Request for removal of access to/from Calder Street	The likely distribution of traffic generation to/from Calder Street is considered in Section 6.1. Movements to/from Calder Street are likely to be minimal as local residents are likely to walk to the station given the proximity. Residents further south of the Proposal (e.g. Akuna Vista) are likely to access/egress via Altrove Boulevard/Aerodrome Driveway.
4	**Public and active transport**	
4.1	Request for improvements to local bus services and other public transport infrastructure to reduce demand on commuter parking	Separate to the Proposal, TfNSW are currently investigating opportunities to introduce additional bus services are expected to be operational later this year. These new services would service customers travelling between Marsden Park and Schofields Station.

No	Issues raised	Response
4.2	Request for extension of the Metro line west of Tallawong	The Australian and NSW Governments have a shared objective of delivering Sydney Metro – Western Sydney Airport in time for the planned opening of passenger services at Western Sydney International. To further integrate public transport into the region, work on early planning for future extensions north towards Tallawong and south towards Macarthur would be undertaken over the next few years. The car park site is within the corridor investigation area for the proposed future metro link and does not preclude any future transport infrastructure due to its flexible and adaptable design.
5	**Consultation**	
5.1	Concerns with the consultation process associated with the Proposal	Community engagement for the Proposal has included notifications to nearby residents, signage at the station and surrounding commuter car parks, email updates to the project mailing list, geographically targeted social media posts and a project webpage. As part of the consultation process, TfNSW has received valuable feedback from the community. This feedback has been reviewed by TfNSW, with corresponding responses provided within this document (the REF) TfNSW would continue to engage with the community during detailed design and construction phases, through notifications distributed to local residents, email updates and updates published on our website.
6	**Noise**	
6.1	Concerns with potential noise impacts	A Noise and Vibration Impact Assessment (NVIA) was undertaken for the Proposal. The potential impacts and mitigation measures for noise and vibration impacts are given in Section 6.3. Noise impacts are anticipated for nearby receivers during construction, however these would be managed by applying reasonable and feasible mitigations. Transport for NSW would consult with land owners on Altrove Boulevard and Bridge Street regarding feasible and reasonable mitigation measures that can be undertaken to address noise associated with the operation of the proposed commuter car park.
7	**Urban design and landscaping**	
7.1	Request for additional public open space on western side of railway	The primary purpose of the Proposal is to provide additional commuter parking to address the current excess demand. The provision of open space within the site would therefore inhibit this objective. Accordingly, the provision of open space within the car park is not proposed. The Proposal does not preclude future development in adjacent areas including public open space.

No	Issues raised	Response
7.2	Request for additional landscaping of the car park	An Urban Design and Landscape Plan would be prepared during the detailed design The Plan would include materials and landscaping, that would be selected on the basis of sustainability principles. The detailed design process would seek to retain existing vegetation where possible, however where this cannot be achieved, any vegetation removed would be offset as per the TfNSW Vegetation Offset Guide. Furthermore, no less than 15% of the total car park area would be landscaped.
7.3	Request for appropriate maintenance of landscaped area during operation	An Urban Design and Landscape Plan would be prepared during the detailed design, this would include vegetation selected for suitability in the area and in consultation with Council. The car park and associated vegetation would be maintained by Sydney Trains during operation.
7.4	Request for additional safety (CPTED) measures as part of design	Customer safety is always at the forefront of decision making in the design and operation of all of our infrastructure and services at Transport for NSW. The commuter car park would be available for customers to use 24 hours a day. The car park would be designed using Crime Prevention Through Environmental Design principles, including features such as full CCTV coverage, lighting and wayfinding signage to help customers navigate the car park in the safest way possible and to discourage undesirable behaviour. Security and safety workshops would also be undertaken during detail design to identify potential safety risks/issues and propose appropriate mitigation measures to ensure safety of commuters using the proposed car park. Access would be controlled through the Transport Park&Ride boom gate system which provides parking for commuters tapping on to connecting public transport journeys and discourages use of the car park by non-genuine commuters.
8	**Contamination**	
8.1	Request for removal of contaminated material on Stockland development site	If contaminated material is identified on the Proposal site, it would be managed in accordance with the EP&A Act and TfNSW Guidelines. Contaminated material located on the Stockland development site would be managed by Stockland as the landowner and developer.

5.6 Aboriginal community involvement

An Indigenous heritage assessment was conducted for the Altrove residential subdivision and construction that has occurred next to and encompassing the Proposal site. An Aboriginal Heritage Impact Permit (AHIP) was sought for the Altrove subdivision activity. The AHIP provided permission for several of these sites, and all those in proximity to the Proposal site to be destroyed as part of the subdivision works.

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

5.7 Ongoing consultation

At the conclusion of the consultation period for the Proposal, Transport for NSW would acknowledge receipt of feedback from each respondent. The issues raised by the respondents would be considered by Transport for NSW before determining whether to proceed with the Proposal (refer to Figure 2, page 14).

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

Should Transport for NSW determine to proceed with the Proposal, the project team would keep the community, council and other key stakeholders informed of the process, identify any further issues as they arise, and develop additional mitigation measures to minimise the impacts of the Proposal. The interaction with the community would be undertaken in accordance with a Community Liaison 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 and transport impact assessment (TTIA) report has been prepared by EMM (March 2021) and is summarised below.

6.1.1 Existing environment

The site is located south of Schofields Road between the intersections of Schofields Road/Veron Road and Schofields Road/Railway Terrace. The area immediately south of the site is occupied by the Altrove residential development (by Stockland). Schofields Station along with Schofields town centre (including the Woolworths supermarket) is located to the east of the site.

Public and active transport

The existing public and active transport network in vicinity to the Proposal site includes:

- **Trains** – Schofields Station is serviced by Sydney Trains T1 North Shore & Western Line and T5 Cumberland Line. Peak hour train frequency in the peak direction is 15 minutes for T1 Line and 30 minutes for T5 Line, and lesser frequencies during the weekends and public holidays.
- **Bus service** – Bus services in this area are operated by Busways and are part of the Greater Western Sydney Bus Network. The nearest bus stops are located on Schofields Road less than 50 metres from the site (to be relocated as part of the Proposal). Bus stops on Railway Terrace are approximately 250 metres from the site.
- **Sydney Metro shuttle bus** – An on-demand bus service is being operated by Cooee Busways in The Ponds, Schofields and Kellyville Ridge areas. The buses can provide pick-ups from agreed points and drop-off at Schofields, Tallawong or Rouse Hill Stations on weekdays 5:00 am to 9:00 pm including weekday public holidays.
- **Pedestrian network and crossing facilities** – There are pedestrian paths and crossing facilities in the vicinity of the site. A shared pedestrian and bicycle path 2.5 metres wide are provided along the site frontage of Schofields Road and Railway Terrace. A pedestrian crossing facility is provided by a refuge island across Schofields Road directly north of the site. The signalised intersections at Schofields Road/Railway Terrace and Schofields Road/Veron Road have pedestrian crossing facilities provided on all approaches.
- **Bicycle network** – There is cycleway connectivity in the vicinity of the Proposal site. Bicycle parking facilities are provided on both sides of Schofields Station. There is a secure bicycle storage shed on the eastern side and bike racks on the western side of the station.

Existing road network

The Proposal site is located south of Schofields Road between the intersections of Schofields Road/Veron Road and Schofields Road/Railway Terrace. The Proposal site has road frontages to Schofields Road and Bridge Street to the north and would, in the future, be linked to an extension of Altrove Boulevard to the south-west.

Table 8 Summary of existing roads surrounding the Proposal site

Road	Road classification	Posted speed limit (Km/h)	Number of lanes each way (excluding near intersections)
Schofields Road	State	70km/h	Two
Veron Road	Local	Typical speed limit of 50 km/h for NSW local roads	Two
Railway Terrace	Regional	50 km/h north of Schofields Road, 60 km/h south of Schofields Road	One
Altrove Boulevard	Local	Typical speed limit of 50 km/h for NSW local roads	One
Bridge Street	Local	Typical speed limit of 50 km/h for NSW local roads	One

Key intersections surrounding the Proposal site comprise:

- Schofields Road and Railway Terrace – signalised intersection with two through lanes in all approaches
- Schofields Road and Veron Road – signalised intersection with one through lane in the north/south directions, and two through lanes in the east west approaches
- Veron Road and Altrove Boulevard – unsignalised intersection, with one through lane in the north, south and east approaches
- Railway Terrace/Bridge Street – signalised intersection with two through lanes in the north/south directions and one through lane in the east/west directions
- Railway Terrace/Woolworths Car Park entrance – roundabout with one through lane on all approaches

6.1.2 Potential impacts

a) Construction phase

During construction, potential impacts include:

- temporary changes in pedestrian and vehicle movements
- temporary increase in heavy and light vehicle movements.

The proposed site compound locations and construction vehicle access points are identified in Figures 11 and 12 respectively.

The volume of construction vehicles accessing the site are expected to be on average 10-20 vehicles per hour, and up to 34 vehicles per hour at peak construction activity with haulage routes expected to utilise Schofields Road.

Construction staff parking would be located on the Proposal site.

b) Operational phase

Traffic generation

During operation, the car park would be accessible 24 hours a day, seven days a week.

For this assessment, the traffic generation has been categorized into site peak and network peak. The site peak represents the peak hour where traffic generated from the site would be at a maximum. It is assumed that 70% (490 trips) of the traffic generation would take place within the site during peak hour. The network peak represents the peak hour where the traffic on the road and intersections in the vicinity would be at a maximum. Consequently, 30% (210 trips) of the remaining traffic generation would take place within the network peak hour or site off-peak hour.

It is further assumed that 90% (441 trips) of the traffic would be inbound within the peak hour, with the remaining 10% (49 trips) being outbound traffic during the AM peak and vice versa during the PM peak. Further details are provided in Table 3.1 of the Traffic Impact Assessment.

Traffic distribution assumptions have been made keeping in view the surrounding land use context, potential for future traffic growth and proposed Schofields Commuter Car Park ingress and egress points. Traffic distribution has been prepared for two potential operational cases as follows:

- Case 1: Altrove Boulevard completed and operational. Vehicular access/ egress via Altrove Boulevard, plus a left in/left access/egress via Schofields Road and Bridge Street, totalling three access/egress points. Refer to Figure 13 for the Case 1 traffic distribution.
- Case 2: Altrove Boulevard/Calder Street extension incomplete, a left in/left out access/egress via Schofields Road and Bridge Street, totalling two access/ egress points. Refer to Figure 14 for the Case 2 traffic distribution.

Intersection performance

The potential operational impacts of the proposal on key intersections were modelled using the SIDRA software. The SIDRA analysis considered existing conditions and two future post-development scenarios in 2021 and 2031 (refer to section 5.1 of the Traffic Impact Assessment).

Schofields Road/Railway Terrace

During Case 1, for both the AM and PM periods, the intersection would operate close to capacity in 2021 and 2031. There would likely be queuing overspills on right turn bays on the Schofields Road south-west approach which would affect northbound through movements.

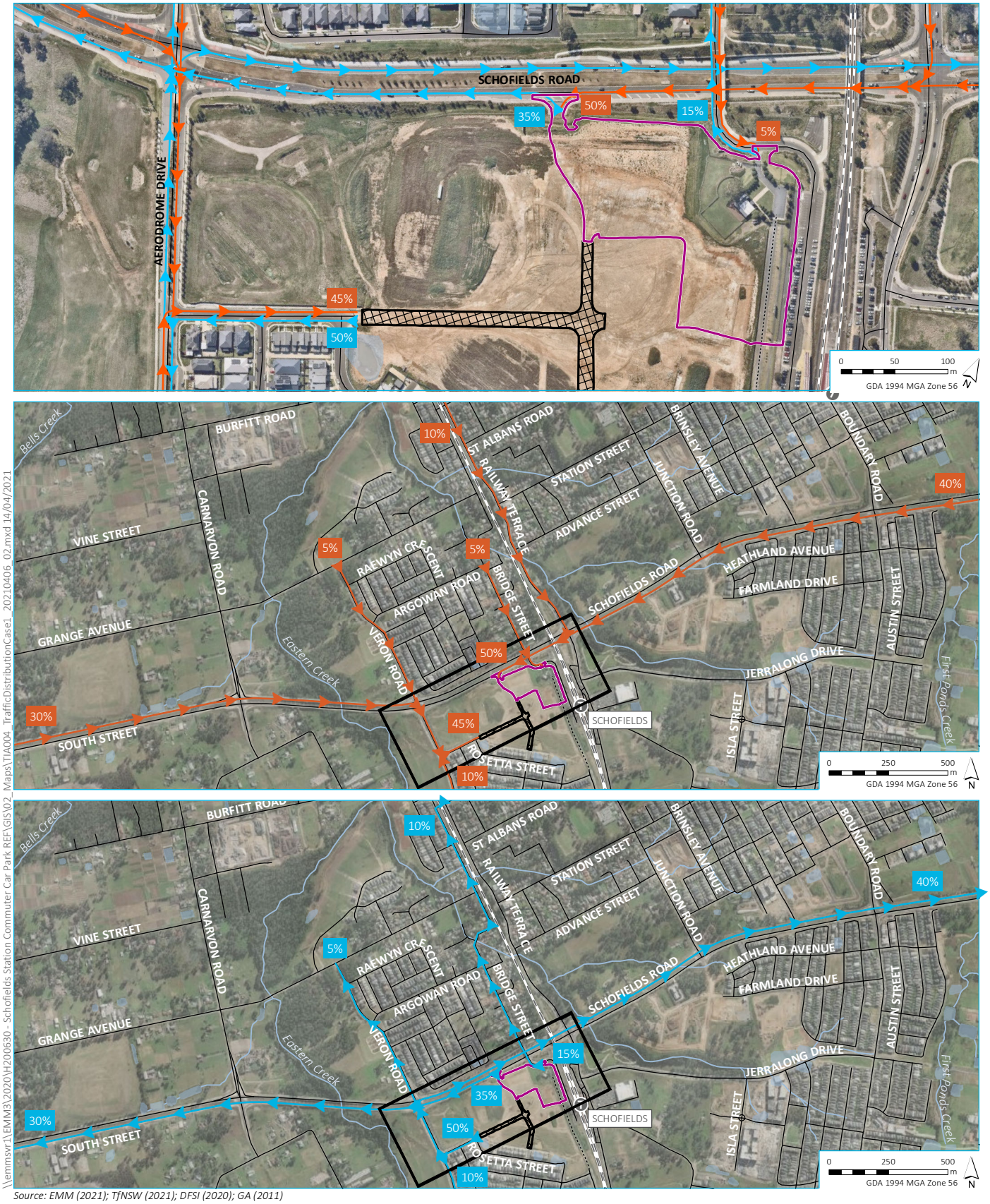
Should the Altrove Boulevard/Calder Street not be completed prior to operation (Case 2), during the AM (network) peak, southern approach queuing would likely extend back to the Woolworths entrance roundabout. This is due to vehicles approaching from the west being required to enter the site via Schofields Road (eastbound), a U turn at the Woolworths entrance roundabout, a left turn at Schofields Road, and a left turn into the car park entrance.

Schofields Road/Veron Road

During Case 1, the intersection performs satisfactorily except in the site PM peak where it would be over capacity in the 2021 and 2031 operational scenarios. There would be queuing of over 100 metres on the Veron Road southern approach which may conflict with northbound through movements.

During Case 2, the intersection performs satisfactorily except in the site PM peak where it would be over capacity in the 2021 and 2031 operational scenarios. The construction of the Altrove Boulevard/Calder Street extension is expected to be completed prior to the car park opening, thus over capacity impacts in 2021 and 2031 operational scenarios are not anticipated.

Considering the predicted Schofields Road/Veron Road intersection impacts, the opportunity to extend the right turn lane by approximately 55m on Veron Road (south approach) could be accommodated through modifications to the existing median. The extension of the right turn lane would likely allow Veron Road to operate at an acceptable level, further sensitivity analysis would be required to confirm the level of service. Modifications to the Schofields Road/Veron Road intersection would be implemented during detailed design.



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Source: EMM (2021); TfNSW (2021); DFSI (2020); GA (2011)

KEY

- Proposal site
- Altrove Boulevard/ Calder Street extension
- Inbound traffic route
- Outbound traffic route
- Train station
- Rail line
- Minor road
- Vehicular track
- Watercourse/drainage line
- Waterbody

Traffic distribution - Case 1

Works by Stockland for extension of Calder Street and Altrove Boulevard completed on the opening of AGCP

Review of environmental factors
Transport for New South Wales
Figure 13

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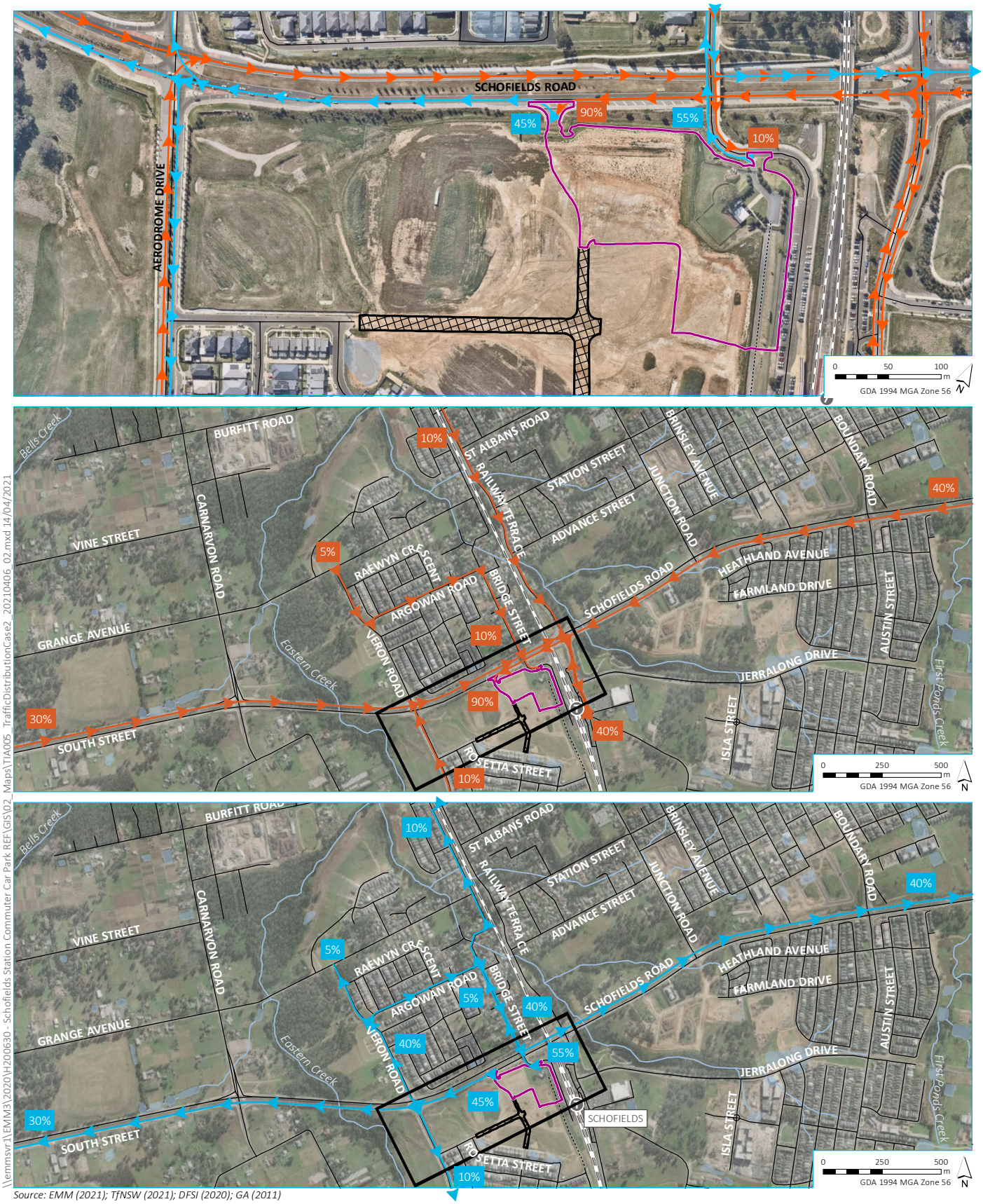

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Source: EMM (2021); TfNSW (2021); DFSI (2020); GA (2011)

KEY

- Proposal site
- Altrove Boulevard/ Calder Street extension
- Inbound traffic route
- Outbound traffic route
- Train station
- Rail line
- Minor road
- Vehicular track
- Watercourse/drainage line
- Waterbody

Traffic distribution - Case 2

Works by Stockland for extension of Calder Street and Altrove Boulevard not completed on the opening of AGCP

Review of environmental factors
Transport for New South Wales
Figure 14

EMM
creating opportunities

Veron Road/Altrove Boulevard

During Case 1, the intersection performs satisfactorily in all scenarios. During the site PM peak, there would be substantial queuing of traffic turning right on to Veron Road for northbound movements from Altrove Boulevard. However overall the intersection would have capacity to accommodate traffic generated by the Proposal.

Should the Altrove Boulevard/Calder Street extension not be completed prior to commencement of operation (Case 2), direct access would not be available to this intersection from the car park.

Railway Terrace/Bridge Street (Westminster Street)

During both Cases 1 and 2, the intersection performs satisfactorily in all scenarios. Although maximum queue lengths (north-western approach) may extend to over 116 metres in the AM peak in 2031, vehicles are likely to be able to clear the intersection in one cycle.

Railway Terrace/Woolworths car park entrance roundabout

During Case 1, no impacts on this intersection are likely as vehicles approaching from the west would be able to access the car park via the Altrove Boulevard extension.

Should the Altrove Boulevard/Calder Street extension not be completed prior to commencement of operation (Case 2), maximum queuing on the southern approach in the AM peak in 2031 of over 61 metres is predicted, due to the requirement for vehicles approaching from the west to carry out a U Turn at the roundabout to enter the Schofields Road entrance.

Road capacity

As part of the traffic impact assessment, the Proposal's potential impacts on mid-block road capacity for Bridge Street and Altrove Boulevard was considered in accordance with the *Guide to Traffic Generating Developments* (RTA, 2002) (refer to Section 5.2 of the Traffic Impact Assessment).

Bridge Street

In Case 1, mid-block capacity was demonstrated to be satisfactory for the two future operating scenarios (2021/2031).

Should the Altrove Boulevard/Calder Street extension not proceed however (Case 2), northbound PM movements in 2021 (297 vehicles) and 2031 (308 vehicles) would approach/exceed the environmental goal of 200 vehicles per hour for the two hour site peak.

Altrove Boulevard

In Case 1, mid-block capacity was demonstrated to exceed the environmental goal (200 vehicles per hour) in the 2021 and 2031 scenarios, for both AM eastbound (215/218 vehicles) and PM westbound (285/298 vehicles).

No operational road capacity impacts would be anticipated for Altrove Boulevard in Case 2.

Impacts on bus stop location

The existing bus stop on Schofields Road near site access would conflict with the presumed changes to the site access acceleration lane. There is potential to relocate the existing bus stop on Schofields Road before the start of site access deceleration lane. The eventual location of the existing bus stop would be finalised after consultation with the relevant sections within Transport for NSW.

Parking

The Proposal would increase the commuter car parking capacity at Schofield Station by approximately 700 spaces. This is expected to reduce informal overflow parking issues throughout the precinct.

Access

Pedestrian, cyclist and bus access to Schofield Station from surrounding areas would remain largely unchanged during operation of the Proposal. However the pedestrian crossing at Schofields Road (refer to Figure 15) would require removal due to a risk of pedestrian-vehicle collision from future exiting vehicles. If removed, pedestrians would be required to cross Schofields Road at either Railway Terrace or Veron Road signalised crossing locations, adding approximately four minutes to their journey.

Notwithstanding, opportunities to relocate the mid-block pedestrian crossing to the west of the current location would be considered as part of detailed design. These opportunities would be developed in consultation with the relevant sections within Transport for NSW.

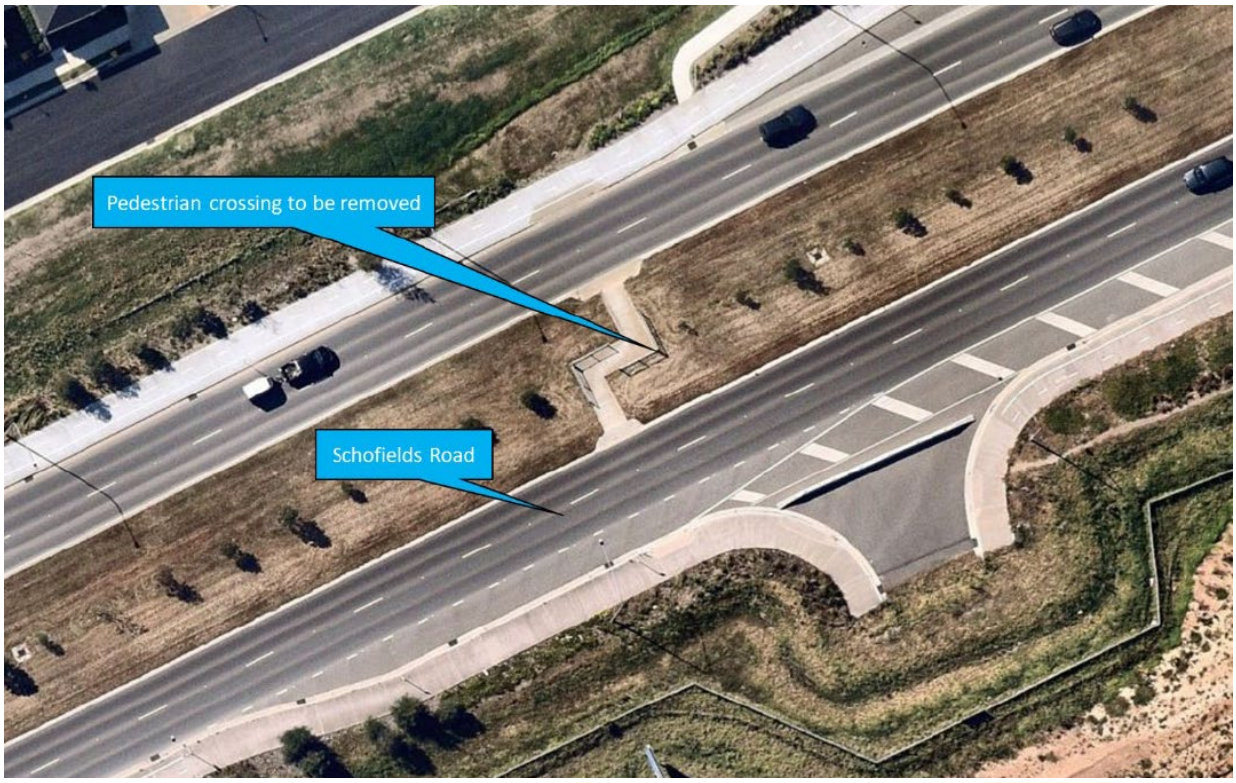


Figure 15 Pedestrian crossing to be removed

6.1.3 Mitigation measures

Refer to Table 15 for a list of proposed mitigation measures.

6.2 Urban design, landscape and visual amenity

An Urban Design Technical Note and Definition Design Report was prepared by FutureRail in February 2021, while visual montages for the Proposal have been prepared by Transport for NSW. This material has been considered during the preparation of this chapter.

6.2.1 Existing environment

The suburb of Schofields is bordered by Riverstone to the north, Rouse Hill to the north-east, The Ponds to the east, Quakers Hill to the south and Marsden Park to the west (refer to Figure 4). Currently, the region surrounding Schofields Station is under development, with a number of residential dwellings either newly completed or in progress. A Woolworths shopping complex lies to the east of the station, which has its own car park facility with restricted customer-only parking arrangements.

a) Existing urban design and landscape character

The Proposal site is spread across R2 Low Density Residential, R3 Medium Density Residential, SP2 Special Purpose and RE1 Public recreation land zones and is bounded by Schofields Road to the north, Bridge Street and Siding Terrace to the east, Altrove Boulevard to the south and Veron Road to the west. Schofields Station is to the east of the Proposal site and Altrove residential development by Stockland is to the south. The Proposal site itself is highly disturbed, having undergone earthworks for construction of the surrounding developments including roads, the railway station and more recently for the Stockland residential development.

This is evident in the aerial photograph of the Proposal site from February 2021, provided in Figure 16. There is an existing Sales and Information Centre for the Altrove residential development in the north-eastern corner of the Proposal site, with a landscaped garden and planted trees.

Figure 16 Aerial view of the Proposal site (FutureRail, 2021)

b) Planned urban design and landscape character

As described in Section 1.2, Schofields is part of the North West Growth Area, which has been identified as an area where significantly more homes would be provided over the next ten years along with associated facilities and infrastructure. In the medium to long term, the Proposal site was planned for medium to high density residential land use, but is also designated as a 'Transport Corridor Investigation Area' (Figure 17) and may support an extension of the Sydney Metro Northwest from Tallawong to Marsden Park. The mix of land uses and public recreation space adjacent to the station would contribute to a vibrant and activated Town Centre in the future, while a local neighbourhood centre would be located immediately south of the Proposal site (Figure 17).

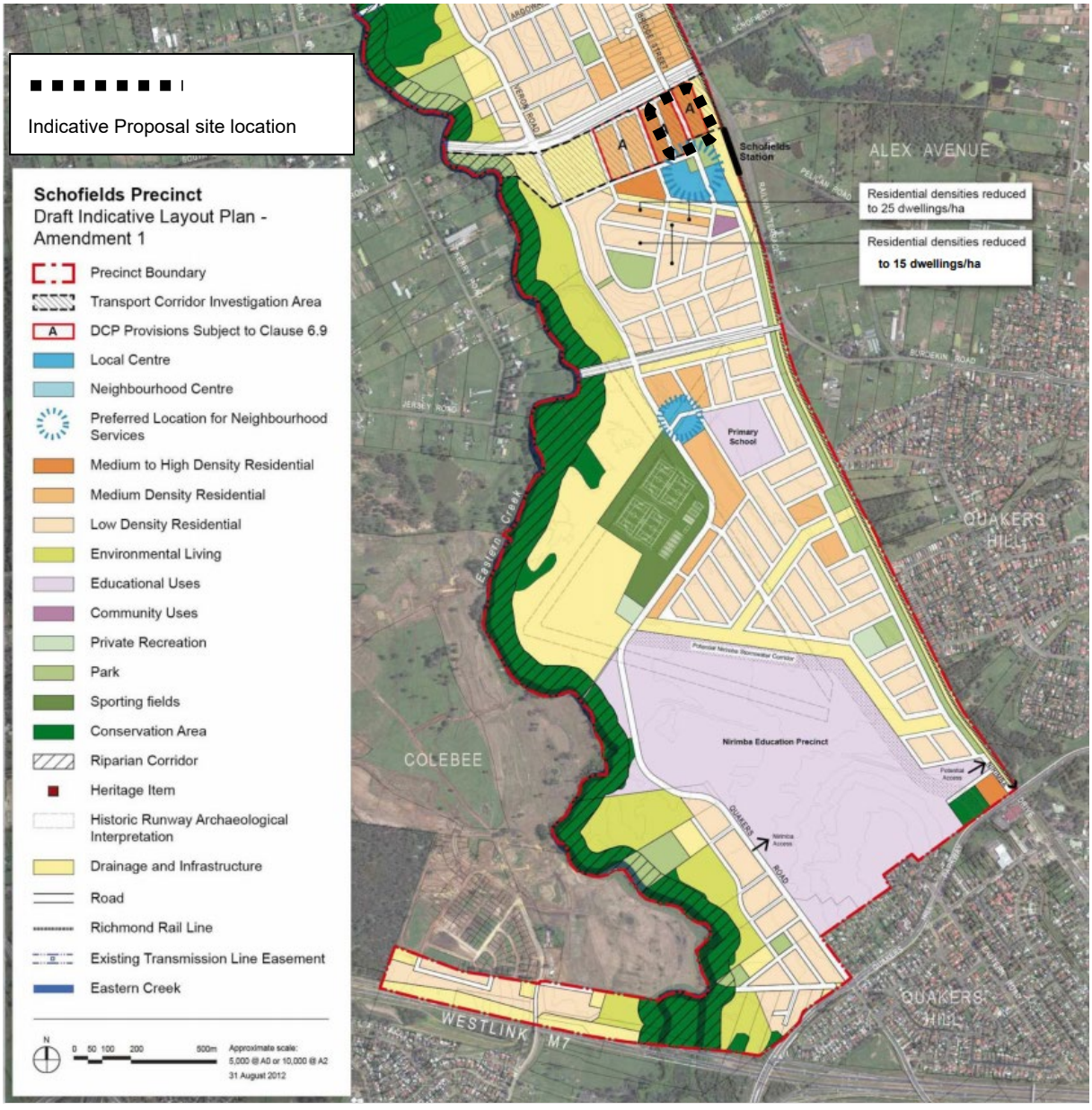


Figure 17 Schofields Precinct Plan, Amendment 1 (DPIE, 2020a)

c) Visual amenity

The Proposal site is located within a generally flat landform, with ground slopes and inclines generally less than five degrees (FutureRail, 2021). Views of the Proposal site from the northeast are partially obstructed by an embankment. However, residences along Altrove Boulevard and those located along Schofields Road to the northwest would have a sensitive viewpoint of the site. Under current conditions, the Proposal site is considered to have a relatively low visual amenity as it comprises a disturbed area with earthworks and construction conducted relatively recently.

6.2.2 Potential impacts

a) Construction phase

Temporary works associated with construction of the car park would include the use of plant and equipment, establishment of site compounds and stockpiling of materials. The construction works would have similar visual characteristics to the recent and previous clearing and earthworks conducted at the site. Further, changes would be temporary and therefore would not have a long term visual impact on the existing or future landscape character.

b) Operational phase

The Proposal would result in a change to the site from the existing cleared area with intermittent stockpiles, to a paved area with associated infrastructure including access control system and vehicle charge points. The car park would be at-grade and as such there would be no new visual receivers or obstruction of views compared with the existing conditions; however, there could be an increase in the potential for receivers to be affected by intermittent glare from cars under certain conditions. Following development, the Proposal would be similar in landscape character to the surrounding area, i.e. mixed-use precinct with existing car parks along Bridge Street and Railway Terrace. Artist's impression of the Proposal is shown in Figure 18a and Figure 18b.

With regards to urban design, would promote beneficial use of a vacant and disturbed site in the short to long term and add to the utilisation of the broader urban area and transport network. Further, unauthorised parking in the surrounding area would be reduced and the car park would have a landscaped verge with screening trees, which could improve the general landscape and visual amenity of the locality and reduce the potential for receivers to be impacted by glare.

6.2.3 Mitigation measures

The design for the Proposal has incorporated a number of features which aim to improve the urban design, landscape character and visual amenity. This would include the provision of a landscaped verge around the perimeter of the car park with provision for screening trees to act as a visual buffer for existing residents. Further, the worksite would be screened with shade cloth (or similar material, where necessary) during construction to minimise visual impacts from key viewing locations.

Refer to Table 15 for a list of proposed mitigation measures.

Figure 18a Artist's impressions of the Proposal

Figure 18b Artist's impressions of the Proposal

6.3 Noise and vibration

A noise and vibration assessment has been prepared by EMM (March 2021) with the results summarised below.

6.3.1 Existing environment

The ambient noise environment of the Proposal site is dominated by road traffic on Schofields Road, Veron Street and Altrove Boulevard. Adjacent to the east of the site is the T1 Western Rail Line whilst further to the east of the rail line are commercial premises including a Woolworths supermarket and BWS.

There are a number of receivers surrounding the Proposal site which may be sensitive to noise, including residential and commercial/retail. Representative noise sensitive locations have been identified for the purpose of assessing potential noise and vibration impacts and are shown in Figure 19. These locations were selected to represent the range and extent of noise impacts from the site and are referred to as assessment locations.

In order to establish the existing ambient noise environment of the area, unattended noise surveys and operator-attended aural observations were conducted at monitoring locations as guided by the procedures described in Australian Standard AS 1055-1997 - *Acoustics - Description and Measurement of Environmental Noise*. The locations at which the existing noise levels were monitored (NM1 and NM2) are shown in Figure 19. The locations were selected as they are considered to be representative of the range of noise levels likely to be experienced by residential assessment locations in the vicinity of the site.

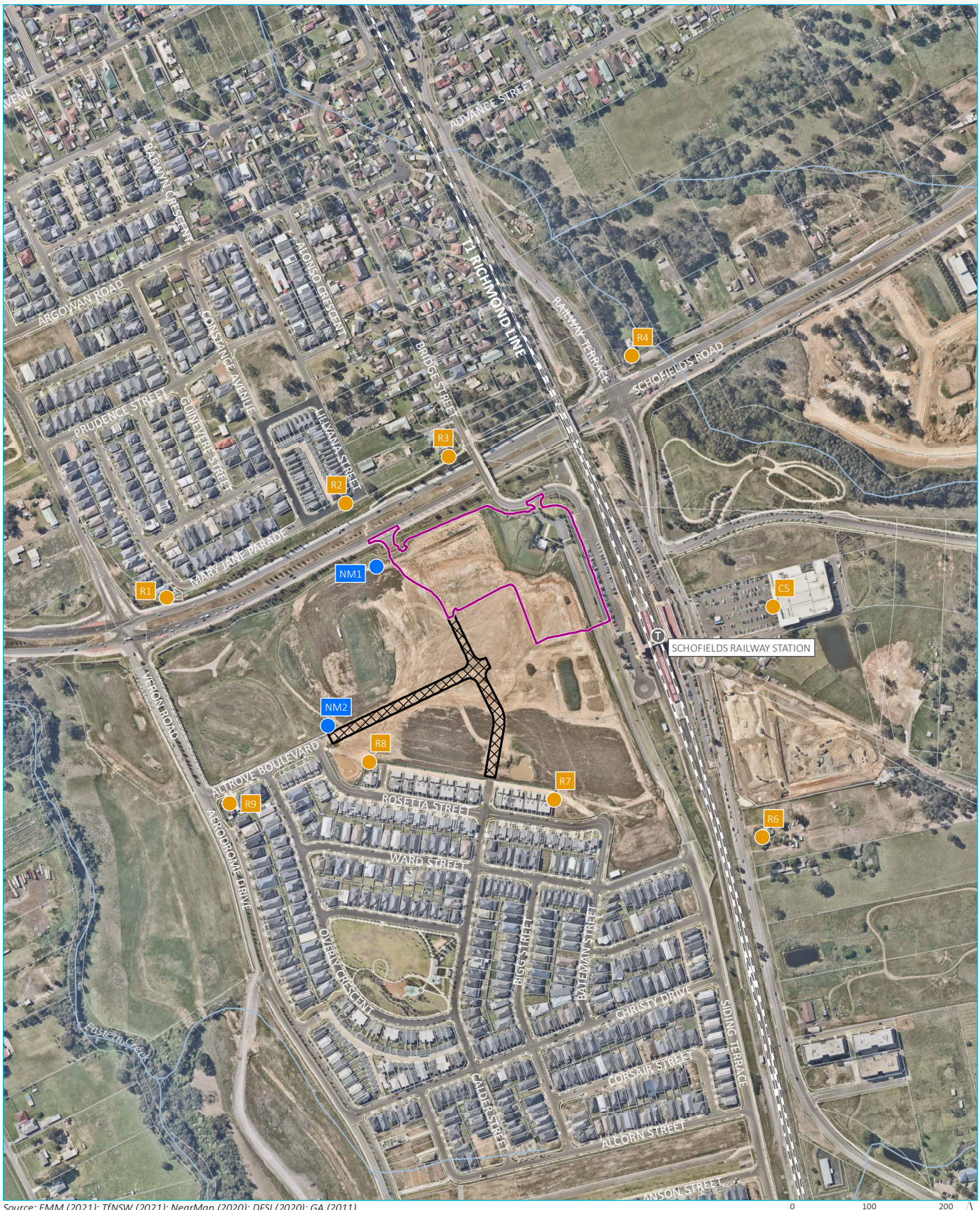
Ambient or background noise level is identified by:

- The 'Rating Background Noise Level' (RBL) – generally determined from the measurement of L_{A90} noise levels, which represents the ambient noise level exceeded for 90 per cent of the monitoring period.
- The equivalent continuous sound level (L_{Aeq}) – the average of the varying noise levels over the monitoring period.

The results of the unattended noise measurements for both monitoring locations, including derived RBLs and equivalent continuous sound are summarised in Table 9.

Table 9 Summary of existing background and ambient noise

Location	Day (7 am to 6 pm Monday to Saturday; 8 am to 6 pm Sundays and public holidays)	Evening (6 pm to 10 pm)	Night (10 pm to 7 am, Sunday to Friday and 10 pm to 8 am Saturday and public holidays)
Rating background level (dBA)			
NM1	45	45	35
NM2	41	43	36
Measured L_{Aeq} noise level (dBA)			
NM1	59	57	52
NM2	52	51	48



Source: EMM (2021); TfNSW (2021); NearMap (2020); DFSI (2020); GA (2011)

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KEY

- Proposal site
- Altrove Boulevard/ Calder Street extension
- Assessment location
- Monitoring location
- Train station
- Rail line
- Watercourse/drainage line
- Cadastral boundary

Noise sensitive receivers and noise monitoring locations

Review of environmental factors
Transport for New South Wales
Figure 19

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Noise monitoring location NM1 was located approximately 36 metres from the nearest road traffic lane on Schofields Road. The day time ($L_{Aeq15hr}$) and night time (L_{Aeq9hr}) noise levels measured at NM1 represent a summary of the existing traffic noise levels, which comprised:

- Day time ($L_{Aeq15hr}$): 58 dBA
- Night time (L_{Aeq9hr}): 52 dBA

6.3.2 Potential impacts

a) Construction phase

Noise

The *NSW Interim Construction Noise Guideline* (ICNG) (Department of Environment and Climate Change, 2009) provides a framework to consider the impacts of construction noise on residences and other sensitive land uses. The guideline recommends that where noise from construction activities could be audible at residential premises, works should be undertaken during standard construction hours, as follows:

- ● Monday to Friday 7 am to 6 pm
- ● Saturday 8 am to 1 pm
- ● no construction work is to take place on Sundays or public holidays.

The ICNG acknowledges that works outside standard hours may be necessary, however, justification should be provided to the relevant authorities.

Under the ICNG, development of specific Noise Management Levels (NML) for standard and out of hours works is required to provide specific noise criteria for construction. There are two types of NML: 'noise affected' and 'highly noise affected'. The noise affected NML, which is the location specific RBL plus 10 dBA, represents the point above which there may be some community reaction to noise. The highly noise affected NML is 75 dBA and represents the level above which there may be strong community reaction to noise.

A computer model was developed to predict and quantify project noise emissions to neighbouring receivers for typical construction activities. The results of the predicted construction noise levels at each assessment location are provided in Table 10 along with a comparison against the relevant NMLs to predict compliance or exceedance. The level presented for each assessment location represents the energy-average noise level over a 15-minute period and assumes all plant operating concurrently.

It is acknowledged that construction of the proposed car park would be during daytime hours only and therefore only NMLs for standard construction hours are provided.

Table 10 Predicted construction noise levels and compliance with NML

Assessment location	Predicted construction noise level, dB $L_{Aeq, 15 mins}$	Noise affected NML ($L_{Aeq, 15 mins}$, dB)	Compliance with noise affected NML	Highly noise affected NML	Compliance with highly noise affected NML
Residential					
R1	53	55	Yes	75	Yes
R2	62	55	No (+4 dB)	75	Yes
R3	62	55	No (+7 dB)	75	Yes
R4	53	55	Yes	75	Yes

Assessment location	Predicted construction noise level, dB $L_{Aeq, 15 mins}$	Noise affected NML ($L_{Aeq, 15 mins}$, dB)	Compliance with noise affected NML	Highly noise affected NML	Compliance with highly noise affected NML
R6	52	51	Yes	75	Yes
R7	56	51	No (+5 dB)	75	Yes
R8	54	51	No (+3 dB)	75	Yes
R9	53	51	No (+2 dB)	75	Yes
Commercial					
C5	55	70*	Yes	75	Yes

**ICNG NML at offices and retail outlets – external noise level when in use*

Construction noise levels are predicted to exceed the noise affected NMLs at a number of assessment locations for standard day construction hours, with modelled contours shown in Figure 20. It is noted that the highly noise affected NML of 75dB is predicted to be met at all locations. Mitigation measures are discussed in Section 6.3.3.

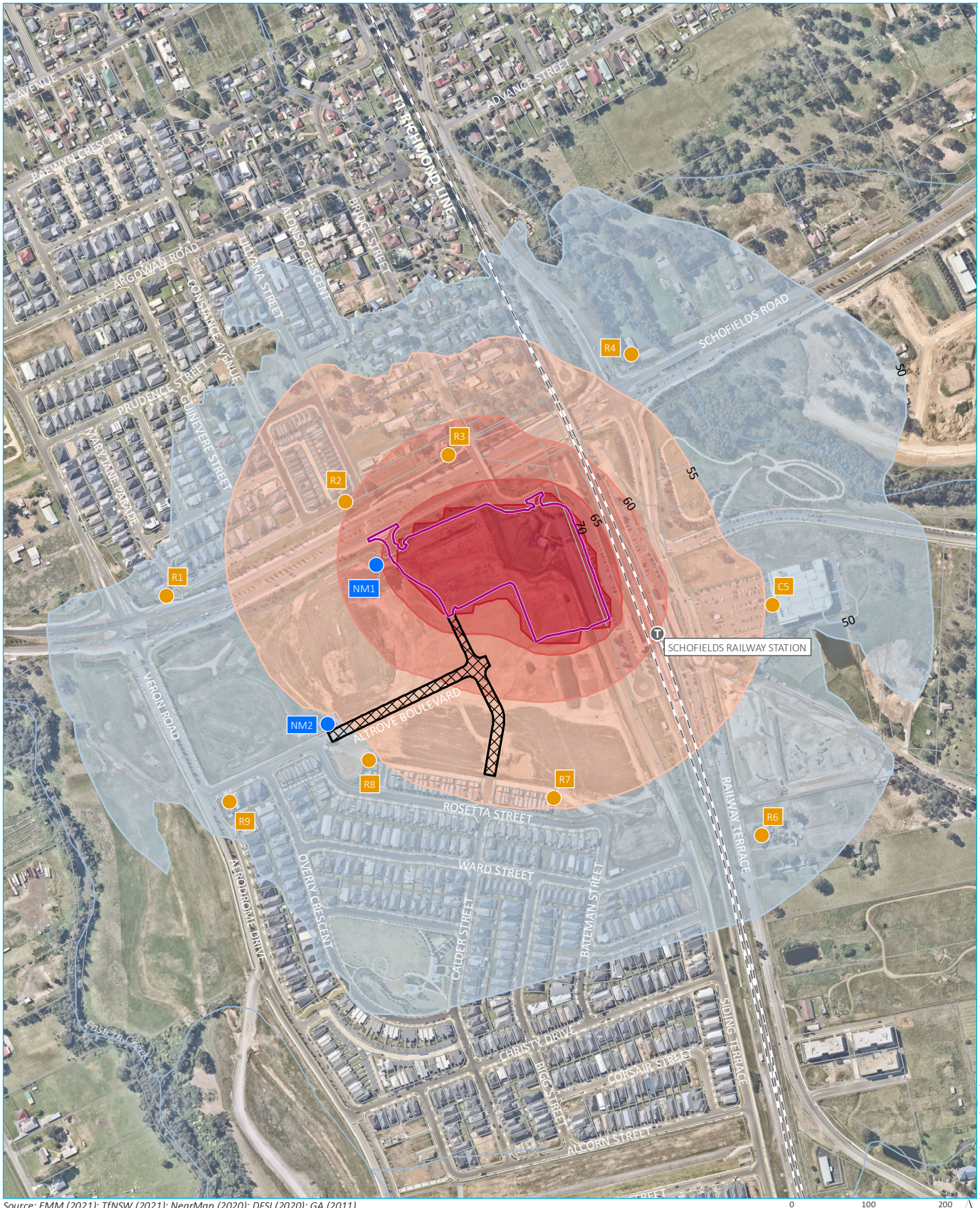
Construction traffic noise

With regards to construction traffic noise, the volume of traffic would be significantly lower than the operational traffic for the site and access for the construction vehicles associated with the commuter car park construction would be via Schofields Road only.

Vibration

An indication of potential offset distances required from sensitive receivers in order to comply with relevant vibration criteria is provided in Table 11. This data is based on publicly available data for other large infrastructure projects in Sydney.

The closest existing residential properties are in excess of 100 metres from the Proposal site. As such, both the human comfort and structural damage criteria are expected to be achieved (Table 11). No additional mitigation is therefore required.



Source: EMM (2021); TfNSW (2021); NearMap (2020); DFSI (2020); GA (2011)

0 100 200 m

GDA 1994 MGA Zone 56

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KEY

- Proposal site
- Altrove Boulevard/ Calder Street extension
- Assessment location
- Monitoring location
- Train station
- Rail line
- Watercourse/drainage line
- Cadastral boundary

Day period noise level contour range

- 50 - 55 dB(A)
- 55 - 60 dB(A)
- 60 - 65 dB(A)
- 65 - 70 dB(A)
- 70 - 75 dB(A)

Construction noise contours, day time

Review of environmental factors
Transport for New South Wales
Figure 20

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Table 11 Estimated safe working distance guidance

Equipment type	Human comfort	Commercial, industrial or similar structures	Dwellings and similar structures	Heritage and other sensitive structures
Large Vibratory Roller (20t)	100m	5m	33m	50m
Medium Vibratory Roller (10t)	100m	5m	20m	31m
Compactor (7t)	50m	5m	20m	20m
Medium Hydraulic Hammer (900kg hammer on 18t excavator)	23m	5m	10m	15m
Light Hydraulic Hammer (300kg on 5t excavator)	10m	5m	5m	5m

Note - The safe working distances provided are indicative and would vary depending on the particular item of plant and local geotechnical conditions. They apply to cosmetic damage of typical buildings under typical geotechnical conditions.

b) Operational phase

Car park noise

The Proposal represents a static noise generating source. Accordingly, guidance for the assessment of operational noise impacts originating from within the car park is taken from the *NSW Noise Policy for Industry* (NPfI) (Environment Protection Authority, 2017). The NPfI sets assessment noise levels, consistent methods, and best practice measures to manage industrial noise.

Operational noise from the car park is associated with vehicles moving, engines starting, vehicles accelerating and doors closing. For the assessment of operational noise, a sound power level of $L_{Aeq(15min)}$ 74 dB was adopted for a single vehicle within the car park. Considering a peak hour utilisation of 70% of the car park the modelling has adopted a worst case scenario of 150 vehicles within a 15 minute assessment period and considering that each vehicle would emit noise typically for five minutes whilst in the car park. Peak usage is anticipated between 6-7am in the morning and 6-7pm in the evening as established in the EMM Traffic report based on Opal card statistics for Schofields station, with relatively little activity during the majority of the night period (i.e. 10pm – 7am).

The predicted operational noise levels at each assessment location during day, evening and night time is provided in Table 12, along with a comparison against project noise trigger levels. Predicted worst case operational noise levels during adverse weather conditions for peak use during the peak ‘night’ (6-7am) and evening (6-7pm) periods are provided in Figure 21.

Noise modelling has demonstrated the project noise trigger levels are satisfied at all assessment locations during day, evening and night time use of the car park facility.

Table 12 Predicted operational noise levels and project noise trigger level

Assessment location	Period	Predicted noise level, $L_{Aeq, 15\ min}$, dB	Project noise trigger level[1], $L_{Aeq, 15\ min}$, dB
R1 to R4	Day (standard ICNG hours)	<35 to 36	50
	Evening (out of hours)		48
	Night (out of hours)		40
R6 to R9	Day (standard ICNG hours)	<35	46
	Evening (out of hours)		46
	Night (out of hours)		41
C5	'When in use'	<35	68

1. The lower of the project intrusiveness (RBL + 5 dB) or project amenity (recommended amenity noise level $L_{Aeq,period}$ from Table 2.2 of NPfI, +3 dB) noise levels

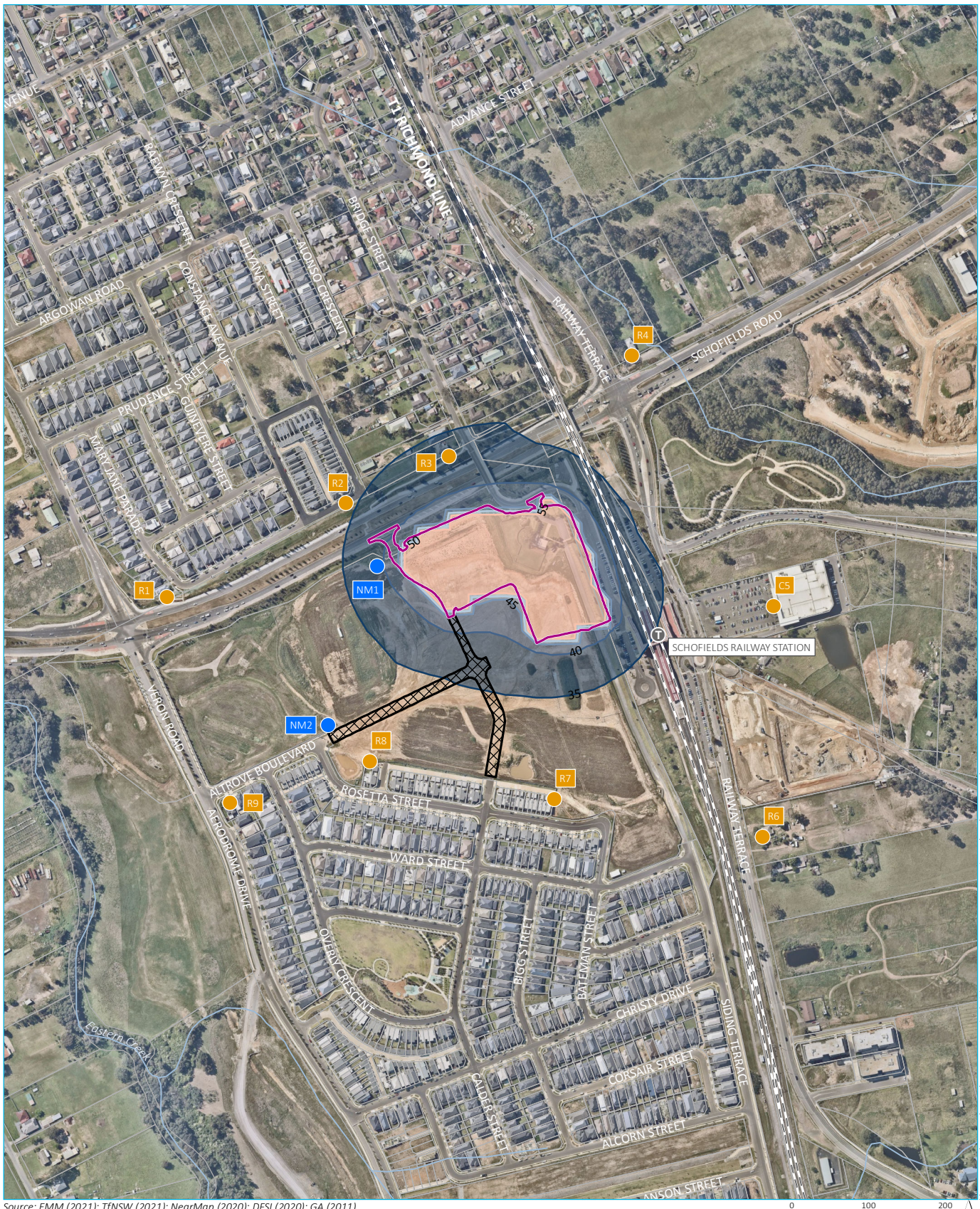
In addition to the general car usage assessment, the impact of transient or intermittent noise events such as door or boot closing was also assessed, with a source sound power level of 95 to 98 dBA adopted. Potential for these events were considered for the full extent of the car parking area. Results of modelling confirm compliance with the sleep disturbance screening level of 52 dBA for all residential assessment locations.

Road traffic noise

The *NSW Road Noise Policy* (Department of Environment, Climate Change and Water NSW, 2011) (RNP) provides the framework for the assessment of noise from vehicular traffic. Road traffic volumes as identified by the traffic impact assessment for the Proposal (EMM, 2021) 6.16.1[OBJ], which identifies the largest potential for increases in road traffic along Bridge Street and Altrove Boulevard.

Road traffic noise levels calculated for existing conditions and predicted levels with the Proposal are provided in Table 13. Under calculated existing conditions, road traffic noise exceeds criteria at Schofields Road during day and night and Bridge Street at night. The RNP states that where existing road traffic noise criteria are already exceeded, any additional increase in total traffic noise level should be limited to an increase of up to 2 dB. The predicted increase in noise levels on Schofields Road and Bridge Street do not exceed 2 dB (for the Case 1 scenario) during the day or night and therefore the road traffic noise would be in compliance with criteria. Although exceedances of the RNP criteria are predicted for the Case 2 scenario for receivers on Bridge St, if this were to eventuate, it would only occur for a short period of time until completion of the Altrove Boulevard connection (at which time the noise environment would change to the Case 1 scenario).

However, an increase in the $L_{Aeq,1hr}$ for Altrove Boulevard of 5.4 dB during the day and 6.9 dB during the night assessment period has been predicted for Case 1 traffic scenario (with Altrove Boulevard completed). This is a 4 dB and 5.6 dB exceedance of the day and night criterion recommended in the RNP for local roads, respectively. It is noted that high levels of road traffic from the Proposal are not anticipated during the night time, however, the AM peak (6-7am) falls in the night assessment period for road traffic noise impacts.



Source: EMM (2021); TfNSW (2021); NearMap (2020); DFSI (2020); GA (2011)

0 100 200 m

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KEY

- Proposal site
- Altrove Boulevard/ Calder Street extension
- Assessment location
- Monitoring location
- Train station
- Rail line
- Watercourse/drainage line
- Cadastral boundary

Day/night period noise level contour range

- 35 - 40 dB(A)
- 40 - 45 dB(A)
- 45 - 50 dB(A)
- 50 - 55 dB(A)
- 55 - 60 dB(A)

Operational noise contours, day / night

Review of environmental factors
Transport for New South Wales
Figure 21

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Table 13 Road traffic noise calculations for peak traffic generation

	Schofields Road (arterial / sub-arterial road)	Altrove Boulevard (local road)	Bridge Street (local road)
Case 1 – Altrove Boulevard/Calder Street extension completed			
Day (7am to 10pm)			
Assessment criteria	60	55	55
Calculated existing level	**68.2**	53.6	51.3
Predicted level	**68.6**	**57.7**	53.9
Increase from calculated existing level	0.4	4.1	2.6
Night (1 pm to 7am)			
Assessment criteria	55	50	50
Calculated existing level	**62.9**	48.7	**52.1**
Predicted level	**63.5**	**56.1**	**53.2**
Increase from calculated existing level	0.6	7.4	1.1
Case 2 – Altrove Boulevard/Calder Street extension incomplete			
Day (7am to 10pm)			
Assessment criteria	60	55	55
Calculated existing level	**68.2**	53.6	51.3
Predicted level	**68.8**	No change	**57.3**
Increase from calculated existing level	0.5	No change	6.0
Night (1pm to 7am)			
Assessment criteria	55	50	50
Calculated existing level	**62.9**	48.7	**52.1**
Predicted level	**64.3**	No change	**54.4**
Increase from calculated existing level	1.3	No change	2.4

Note - bold text indicates an exceedance of assessment criteria.

6.3.3 Mitigation measures

Construction

The ICNG recommends the following where NMLs are predicted to be exceeded:

- application of feasible and reasonable work practices to minimise noise
- inform potentially impacted residents of the nature of the works to be carried out, expected noise levels and duration and relevant contact details.

There is limited opportunity to provide at source or mitigation in the form of acoustic barriers due to site topography and extent of working area for mobile plant. In accordance with the ICNG, residents would be notified prior to works commencing and inform them of the duration and noise level of the works and any proposed respite periods.

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) and the *Construction Noise and Vibration Strategy* (Transport for NSW, 2019b). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.

Operation

During detailed design, feasible and reasonable mitigation measures should be considered to reduce road traffic noise on Altrove Boulevard. Mitigation options to be considered include:

- Restriction of vehicles on Altrove Boulevard through various design options (redesign of access / egress options, provision of a new private access road to Veron Road, etc.)
- Receptor noise mitigation (at-receiver building treatments).

Refer to Table 15 for a full list of proposed mitigation measures.

6.4 Indigenous heritage

An Aboriginal heritage due diligence assessment has been prepared by EMM (May 2021). The results of the due diligence are summarised below.

6.4.1 Existing environment

The Proposal site is situated on the shoulder of a ridge line (upon which Railway Terrace is situated) on moderate slopes. This type of landscape restricts a number of archaeological site types, such as rock shelter and rock engravings, which require sharp exposed sandstone relief not common in these areas. Conversely, surface artefact scatters and, to a lesser extent, buried cultural material are likely to be more prevalent.

There have been a number of archaeological studies in the Schofields region as a result of urban development. The studies generally found that there were Aboriginal sites in the locality, which were largely restricted to isolated artefacts and / or artefact scatters of varying density. As such, any cultural materials would be most likely to occur on the surface or in the upper part of the soil profile in this region.

An Indigenous heritage assessment was conducted for the Altrove residential subdivision and construction that has occurred next to and encompassing the Proposal site. An Aboriginal heritage impact permit (AHIP) was sought for the Altrove subdivision activity, which appears to have used data from the AECOM study of the larger Schofields precinct study (2011).

This study identified eight Aboriginal sites in close proximity to the Proposal site, primarily isolated Aboriginal objects and/or low-density artefact scatters. The AHIP provided permission for several of these sites, and all those in close proximity to the Proposal site to be destroyed as part of the subdivision works. As evident from the disturbed nature of the site, these works appear to have been initiated in the last few years, and as such these sites are considered to have been destroyed. This is confirmed by a search of the Aboriginal Heritage Information System (AHIMS) database, which found there are no Aboriginal sites within the Proposal site.

6.4.2 Potential impacts

a) Construction phase

It is considered that there is a low risk of further Aboriginal objects being present within the Proposal site and therefore there is a low impact of impacting Aboriginal heritage objects or sites.

a) Operational phase

During operation of the car park, there would be no disturbance to the surface or sub-surface, which would be paved. As such, no impacts to Indigenous heritage are expected.

6.4.3 Mitigation measures

In the event of an unexpected find of potential Aboriginal objects, sites or places during construction, all works in the vicinity should cease and the proponent should determine the subsequent course of action in consultation with a heritage professional and/or the relevant State government agency as appropriate.

Refer to Table 15 for a list of proposed mitigation measures.

6.5 Socio-economic impacts

6.5.1 Existing environment

As outlined in Section 1.2, the Proposal is located within the suburb of Schofields in the Blacktown LGA, approximately 45 kilometres west of the Sydney CBD.

The Western Sydney University campus is located within the Schofields suburb, approximately 2.5 kilometres south of the Proposal site. There are also a number of childcare facilities, schools and amenities including cafes, grocery stores and recreational areas. The Proposal site is wholly within land owned by Stockland, planned for future residential development in the mid to long term.

The population of Schofields was 4,983 in 2016 (ABS, 2016). The suburb has a relatively low median age of 32 (compared with a State and National median of 38) and has an average of 3.1 people per household. Dominant occupations for residents of the suburb are professionals (21 per cent), clerical and administrative workers (17 per cent) and technicians and trades workers (15 per cent) (ABS, 2016).

The population of the Blacktown LGA is forecast to grow from approximately 380,000 in 2020 to 500,000 by 2036, an increase of 33 percent (idcommunity, 2017). Large areas in the Blacktown LGA have been identified for urban development over the next 20 to 30 years, which includes Schofields. As part of the North West Growth Area, Schofields has been identified to benefit from up to 2,950 new homes and the delivery of local amenities close to transport options, including:

- 61 hectares of conservation land, focused along Eastern Creek
- 31 hectares of open space and recreation areas
- retail space in three neighbourhood centres
- a potential public transport corridor linking Schofields station to Rouse Hill
- upgrades to key roads
- improved connections to encourage walking and cycling.

Accessible, safe and connected transport options are a key infrastructure component for this developing community. Key transportation networks within Blacktown are the Great Western Highway, Westlink (M7), Western Motorway (M4) and the Richmond and Main Western railway lines. The commuter parking demand around Schofields Station exceeds the existing car parking facilities comprising a total of 352 spaces. These car parks are typically full by 8:00am on weekdays and parking surveys have identified that demand exceeds capacity by as much as 600 spaces (noting that these surveys were conducted prior to the COVID-19 pandemic). This leads to unauthorised parking along surrounding local roads and within nearby private customer-only car parks.

6.5.2 Potential impacts

a) Construction phase

During construction of the Proposal, the surrounding residents and businesses may be affected by a minor increase in traffic and temporary visual, dust and noise impacts. However, construction activities would be similar to those recently conducted in the area as part of the broader urban and residential development.

The construction activities including construction compounds and any site facilities would be located wholly within the Proposal site. The existing Altrove Sales and Information Centre would require removal, but is anticipated to be replaced by a new centre outside of the Proposal site (subject to a separate assessment and approval).

Sustainability criteria for the Proposal would be established to encourage the construction contractor to purchase goods and services locally and from responsible suppliers in accordance with the sustainable procurement policies. This would help to ensure the local community benefits from the construction of the Proposal in a sustainable manner.

b) Operational phase

The Proposal would provide an additional 700 commuter parking spaces and improve the accessibility, safety and connectivity to public transport for surrounding residents and users of Schofields Station. The Proposal would encourage public transport use and reduce the current unauthorised parking along surrounding local roads and in private car parks, providing improved amenity for the surrounding residents and businesses. The provision of accessible, safe and connected transport infrastructure is in accordance with the Commuter Car Park Program objectives.

Potential social impacts from operation of the Proposal include reduced amenity for local residents as a result of increased traffic and associated noise, as described in Sections 6.1 and 6.3. Further, the adjustment to the bus zone, shared pathway and pedestrian crossing on Schofields Road could result in users of the bus stop being required to walk further to access it. However, the distance is not expected to be significant, and the distance would equally be reduced for other users.

The Proposal would be located on land intended for future residential development and would require a lease or temporary acquisition for its operation. However, given that there is no planned interim use for the vacant land, this would provide a positive use of the land in the short to medium term.

6.5.3 Mitigation measures

Implementation of the mitigation measures for traffic, noise, air quality and visual amenity would avoid or minimise potential socio-economic impacts. These mitigation measures are outlined in Sections 6.1, 6.2, 6.3 and 6.13. Further, consultation and engagement with the local community prior to and during construction would encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where practicable.

This would include mechanisms to provide details and timing of proposed activities to affected residents and businesses, including changed traffic and access conditions. Community and stakeholder consultation is addressed in Section 5.

Refer to Table 15 for a list of proposed mitigation measures.

6.6 Biodiversity

6.6.1 Existing environment

A search of the EPBC Act Protected Matters Search Tool on 8 November 2020 identified six threatened ecological communities, 39 threatened species and 15 migratory species within approximately one kilometre of the Proposal site (Appendix C). Threatened species identified in the search as having the potential to occur in the area included nine birds, two fish, two frogs, seven mammals and 19 plants.

The Proposal site is heavily disturbed and predominantly devoid of vegetation due to earthworks conducted as part of groundworks for the existing and future Stockland residential development. The exception is the Altrove Sales and Information Centre located in the north eastern corner of the Proposal site, which has a landscaped garden with planted trees and contains one mature native tree, likely a Eucalyptus or Corymbia (Figure 22). The mature native tree is located within the landscaped garden and could provide habitat for native fauna, particularly if any hollows are present.

Figure 22 Planted trees and mature native tree within Altrove Sales and Information Centre

6.6.2 Potential impacts

a) Construction phase

The majority of the Proposal site has been recently cleared as part of residential developments and therefore would not require clearing of vegetation for construction. The planted trees and landscaped garden within the Altrove Sales and Information Centre would be removed, but this vegetation is not considered to be of ecological significance.

If possible, the mature native tree (Eucalyptus or Corymbia) in the north east of the Proposal site should be retained. If retaining the tree is not possible then removal could impact threatened fauna in the area as identified in Appendix C if it is being used as habitat. However, this is considered unlikely given that the tree is isolated and surrounded by an urban environment. Mitigation measures described below would minimise the potential impact to fauna.

No impacts on matters of national environmental significance are predicted as a result of the Proposal, as summarised in Appendix A.

b) Operational phase

The trees to be planted as part of the landscaping around the perimeter of the car park would contribute toward offsetting the vegetation removed from within the Altrove Sales and Information Centre during construction.

6.6.3 Mitigation measures

The mature native tree would be preserved if possible, however, should it need to be removed, provide clearance supervision by an appropriately qualified ecologist. This would include the inspection for habitat items (for example nests or tree hollows) prior to felling and the supervision of the removal of any habitat items if required.

Refer to Table 15 for a list of proposed mitigation measures.

6.7 Contamination, landform, geology and soils

A Phase 1 Geotechnical Report was prepared by FutureRail in February 2021, with the results summarised below.

6.7.1 Existing environment

Soil landscape and geology

Schofields is underlain by the Blacktown soil unit, which comprises of gently undulating rises on Wianamatta Group shales with local reliefs to 30 metres. Ground slopes and inclines are generally less than five degrees. Silts and clays are the predominant soils within this soil landscape unit, with varying degrees of plasticity. Soil erodibility is generally moderate, but where there are highly dispersible soils there is the potential for higher erodibility. Erosion from water is generally considered to be moderate to high under significant flows. Poor soil drainage can also be expected in low lying, constrained areas. Localised areas of high shrink-swell potential may also be prevalent which impact on shallow foundations for structures.

Due to the earthworks already conducted at the site to create levelled areas and new roads, fill material can be anticipated across the site. The type, thickness and extent of the fill material is unknown, but it was noted that the fill is likely to be controlled and compacted to a standard suitable for development (FutureRail, 2021b).

Acid sulphate soil

Reference to the Acid Sulfate Soil Risk Map for Springwood/Riverstone indicates that there is no known occurrence of Acid Sulphate Soils at the Proposal site.

Contamination

As described above, the Proposal site has undergone earthworks with fill material likely to dominate the land surface. The origin and quality of this fill is unknown and therefore has the potential to include contaminants.

A stockpile with asbestos-containing material is located on the southeast corner of the Proposal site. The stockpile would be removed by Stockland prior to construction.

Surrounding the Proposal site, potentially contaminated land uses include:

- Schofields Station and rail corridor located to the east
- road corridors to the north, east, south and west, with the potential for historical or current spills / leaks from vehicles or vehicle crashes.

A review of the NSW EPA contaminated land register and the POEO Act public register on 12 November 2020 indicates 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 PoEO Act register did identify a former Environmental Protection Licences (EPL) in vicinity to the Proposal site for the Richmond Line Duplication Project Stage One – Quakers Hill to Schofields Veron Road (reference 13189). No non-compliances related to contamination were raised through the duration of the licence (2009 – 2012).

A site inspection conducted by Future Rail on 8 January 2020 did not identify any obvious soil contamination issues.

6.7.2 Potential impacts

a) Construction phase

The Proposal would require earthworks and some trenching, excavation or grading for installing services, drainage works and new paving. Soils across the site are expected to be readily excavatable with conventional earthmoving equipment and the site is relatively flat and not within a mapped acid sulfate soils area. Accordingly impacts to soils are not anticipated as part of the Proposal.

While there is no existing known contamination in the Proposal site, there is always the potential to encounter previously unknown contamination during construction. Further, the Proposal has the potential to cause soil contamination from accidental spills or leaks of fuels, oils and other chemicals from equipment and vehicles during construction. The construction works would also have the potential to increase erosion at the site. The management measures outlined in Section 6.7.3 would be implemented to mitigate the potential impacts identified.

b) Operational phase

The operation of the Proposal would have no material change to geology, soils, hazardous materials or contamination. The risk of soil erosion within the Proposal site during operation would be minimal as all areas impacted during construction would be sealed or landscaped to prevent soil erosion. However, there could be a risk of run-off from the car park causing erosion in the receiving environment if not managed appropriately.

Use of the car park may result in negligible spills and leaks from cars during operation however these would be managed as part of the water sensitive urban design elements of the Proposal.

6.7.3 Mitigation measures

A Construction Environmental Management Plan (CEMP) would be developed for the Proposal. The CEMP would include mitigation measures to manage erosion and sediment control as well as adequate water quality and hazardous materials procedures (including spill management procedures, use of spill kits and procedures for refuelling and maintaining construction vehicles/equipment) in accordance with relevant EPA guidelines and the Transport for NSW *Chemical Storage and Spill Response Guidelines*. An appropriate unexpected finds protocol, considering potential contaminants, would be also included in the CEMP.

Refer to Table 15 for a list of proposed mitigation measures.

6.8 Hydrology and water quality

6.8.1 Existing environment

Surface water

Eastern Creek is located approximately 400 metres from the Proposal site, to the west of Veron Road. A tributary of Eastern Creek is located on the eastern side of Railway Terrace. There is a stormwater retention basin located immediately adjacent to the Proposal site to the west. The Proposal site slopes from east to west and therefore surface water would flow into the detention basin to the west and then onwards into Eastern Creek. The water quality in Eastern Creek is generally good, but Eastern Creek to the north of the Proposal site had a reduction in water quality in 2018 from 'good' to 'fair', with some indication of potential water pollution (Blacktown City Council, 2018).

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. Whilst there was no site-specific groundwater information available, it is likely that depth to groundwater would be lower on the western side of the Proposal site compared to the east, given the topography of the site and presence of a natural waterway to the west of the Proposal site.

Flooding

The Blacktown LEP mapping does not identify the Proposal site as flood liable. Review of the NSW State Emergency Service website for flood risk in the Hawkesbury-Nepean Valley (NSW SES, 2020) identified that the Proposal site is likely to be outside of the flood zone for the majority of flood events (up to a one in 500 chance per year flood).

6.8.2 Potential impacts

a) Construction phase

During construction, there is a risk of contamination to surrounding surface water or groundwater as a result of accidental spills of fuels, oils or chemicals, or inappropriate management of wastewater. Further, run off from the site could cause sedimentation of nearby waterways if appropriate erosion and sediment controls are not implemented.

Implementation of appropriate mitigation measures would adequately manage the potential for impacts to water quality.

b) Operational phase

The Proposal would result in an increase in impervious areas due to the existing soil / grassed area being replaced with hardstand. This would result in a change to the drainage of the current area. Design of the stormwater and drainage infrastructure including on-site detention in accordance with the relevant Transport for NSW, Sydney Water and Council standards and requirements would mitigate the potential impact of surface runoff. A system to collect contaminants from the stormwater such as heavy metals or fuel from vehicles using the car park would also be required to prevent pollution of the nearby waterways.

The Proposal site has a very low flood risk. As part of construction, the car park would be raised and therefore it would be unlikely to be inundated during a flood when operational. However, as a result of the altered topography and increased impervious surface, the Proposal has the potential to alter flood behaviour in the vicinity of the Proposal. Further hydrological assessment would be undertaken to ensure the detailed design would take into consideration stormwater management and flood risks.

6.8.3 Mitigation measures

The following mitigation measures would be implemented to minimise hydrological and water quality impacts:

- a detailed stormwater design would be undertaken to confirm the potential changes to flooding impacts for surrounding properties which have potential to be affected by changes in flood levels and behaviour as a result of the Proposal.
- adequate measures are to be provided to ensure that the Proposal would (as far as practicable) avoid any increase in existing flood impacts to surrounding areas/properties and to minimise flood risks within the car park. The potential impacts of climate change on flooding shall be considered to ensure safe access and infrastructure is maintained.
- runoff would require water treatment before discharge into the existing road drainage or waterways. Stormwater is to be managed in accordance with Blacktown City Council's Water Sensitive Urban Design Development Control Plan.
- Implement mitigation measures described for contamination and soils as described in Section 6.7 to minimise potential water quality impacts.

Refer to Table 15 for a list of proposed mitigation measures.

6.9 Waste

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

- Excess or unusable spoil
- Building materials and green waste from relocation of the Altrove Sales and Information Centre
- Packaging and general waste from staff (for example paper, lunch packaging)
- Chemicals and oils
- Wastewater from portable toilets, wash-down and bunded areas
- Excess concrete
- Redundant erosion and sediment controls.

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

The handling, storage, transport and disposal of asbestos and hazardous waste (including any lead waste) would be in accordance with the requirements of relevant EPA and Safe Work NSW guidelines. Waste management targets in consideration of the *NSW Sustainable Design Guidelines – Version 4.0* (Transport for NSW, 2019a) would be developed for the Proposal and would include reuse and recycling.

Table 15 provides a list of mitigation measures that are proposed to manage waste during construction.

6.10 Sustainability

Sustainability approach

A Sustainability Technical Memo was prepared by FutureRail in October 2020, which states that through embedding environmental, social and economic considerations across all disciplines, at every design stage and in every significant project decision, the Schofields Commuter Car Park design supports Transport for NSW's commitment to 'delivering transport services, projects, operations and programs in a manner that balances economic, environmental and social issues to ensure a sustainable transport system in NSW'.

An integrated sustainability approach is being implemented to generate multiple benefits. This includes designing better building and infrastructure performance, operational efficiency and maintenance requirements, whole-of-life cost and greenhouse gas (GHG) emission savings and, importantly, safe and healthy environments for the community and customers.

A Sustainability Strategic Management Plan was developed for the Commuter Car Park program and provides a framework for identifying and managing sustainability risks, impacts and opportunities associated with the delivery and operation of the program. The Proposal would be delivered under this program.

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

Construction phase constraints and opportunities

Construction of the Proposal would require the use of a number of resources, including:

- Resources associated with the operation of construction machinery and motor vehicles (e.g. use of diesel and petrol)
- Material required for car park surface and pavements (such as road base, asphalt, spray seal, sand, concrete and aggregate)
- Fill required to meet design levels
- Construction water (e.g. for concrete mixing and dust suppression).

The materials required for construction of the Proposal are not currently limited in availability. However, materials such as metal and fuel are non-renewable and would be used conservatively. The existing Altrove Sales and Information Centre is a prefabricated structure and therefore would be relocated and reused at a new location, rather than requiring demolition.

Operation phase constraints and opportunities

The large area of hardstand presents a risk of increased stormwater runoff associated with the loss of soil. Opportunities to mitigate this risk include landscaping around and within the car park site and implementing water sensitive urban design principles in accordance with TfNSW Water Sensitive Urban Design Guideline.

Urban areas can become substantially warmer than surrounding areas when there is less green cover and more hard surfaces which absorb, store and radiate heat (i.e. the urban heat island (UHI) effect). The construction of the Schofields Commuter Car Park is expected to contribute to the local UHI. However, as part of detailed design, TfNSW would investigate opportunities to mitigate the effects of UHI through initiatives that increase shade (e.g. landscaping) and increase the reflection of sunlight (e.g. light coloured material).

The Proposal supports the principles of sustainability by encouraging a reduction in private vehicle use and increase in the accessibility of public transport services.

6.11 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 bushfire.

A high-level climate change risk assessment screening was performed using the Transport for NSW *Climate Risk Assessment Guidelines* (TfNSW, 2017b), and relevant climate data and projections from Adapt NSW and the Bureau of Meteorology as part of the design development of the Proposal.

Climate change could lead to an increase in the intensity of rainfall events, whereby the rainfall expected to occur in a 100-year average recurrence interval flood event would occur more frequently.

The climate projections for Metropolitan Sydney in 2030 include an increase in mean temperature of 0.65°C which is expected to rise 1.94°C by 2070.

Projections also include an increase in the number of hot days with a maximum temperature of over 40°C and increased annual rainfall and rainfall extremes.

The climate change risk assessment is based on the projected changes in the climate and the estimated design life of Proposal components to assess the likely consequences and likelihood of climate risks occurring. The detailed design would consider the impacts of climate change on the Proposal through:

- selection of materials and equipment for durability in extreme conditions and that minimise heat retention to reduce the heat island effect
- implementing a landscaping plan that would help to reduce the effects of increase heat and the urban heat island effect
- incorporate fire resistant/retarding materials wherever practicable
- incorporate engineering and design features to ensure structures are constructed to minimise direct impacts from severe storms and strong winds.

6.12 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.

Due to the small scale of the Proposal and the short-term temporary nature of the individual construction works, it is considered that greenhouse gas emissions resulting from the construction of the Proposal would be minimal. Furthermore, greenhouse gas emissions generated during construction would be kept to a minimum through the implementation of the standard mitigation measures detailed in Table 15.

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

6.13 Other impacts

The existing environment, potential impacts and associated safeguards and management measures for environmental factors with negligible to minor impacts is provided in Table 14.

Database searches were conducted to inform the existing environment on 11 April 2021 of the Australian Heritage Database, State Heritage Inventory, Blacktown LEP, the Section 170 Heritage and Conservation Registers of Transport for NSW and the National Pollution Inventory (NPI).

Table 14 Environmental impact assessment – other impacts

Existing environment	Potential impacts	Safeguards and management measures
Non-indigenous heritage		
There are no recorded Non-indigenous heritage items within or in close vicinity of the Proposal site.	No known historical heritage items or places would be impacted by construction of the Proposal. The risk of discovering an unidentified relic or areas of predicted occupation deposit during construction within the Proposal site is considered very low.	In the event that any unexpected archaeological deposits are identified within the Proposal site during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019c) would be followed, and works within the vicinity of the find would cease immediately.

Existing environment	Potential impacts	Safeguards and management measures
Non-indigenous heritage		
Air quality		
The existing air quality in the area surrounding the Proposal is predominantly influenced by emissions from motor vehicles from the surrounding road and rail network. One facility with air emissions was identified by the NPI within the Schofields suburb, namely PGH Bricks and Pavers, located approximately two kilometres from the Proposal. Nearby sensitive receivers are predominantly residences, while the surrounding area includes businesses, childcare centres and schools.	***Construction*** Operation of vehicles, plant and equipment would generate exhaust emissions during the construction phase, although it is unlikely that these would result in adverse air quality given the context of works along an existing heavily trafficked rail line and road network. Construction of the Proposal would generate dust from mechanical disturbance and wind erosion from disturbed surfaces. Sensitive receptors closest to the Proposal site have the highest potential for adverse air quality impacts. ***Operation*** The Proposal would promote use of public transport causing a relative decrease in the use of private motor vehicles by commuters and an associated overall reduction in exhaust emissions. However, on a local scale is it expected that exhaust emissions could increase, for example during the evening peak when vehicles may queue along Altrove Boulevard to exit the car park.	A CEMP would be developed for the Proposal which would include management measures to reduce exhaust and dust emissions to minimise the impact to air quality.

6.14 Cumulative impacts

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

A search of the planning registers was conducted on 11 April 2021, the results are summarised below:

Department of Planning, Industry and Environment's Major Projects Register

- one major development application in vicinity of the Proposal, namely Alex Avenue Public School Mod 3 (approved in December 2020), for the staged construction and operation of a new school located approximately one kilometre from the Proposal site

Sydney Central City Planning Panel Portal – three determined projects within the past two years within Schofields suburb, comprising:

- staged subdivision for residential lots at Burdekin Road, approximately 1.2 kilometres from the Proposal site (approved in May 2020)

- shopping centre at Railway Terrace approximately 500 metres from the Proposal site (approved August 2019)
- multi dwelling housing located approximately 1.5 kilometres east of the Proposal site (approved August 2019)

Blacktown City Council Development Application register

- a number of development applications are outstanding across the suburb of Schofields for projects including subdivisions, residential modifications and intersection modifications.

The database searches identified a number of developments which are either ongoing or planned in the near future, confirming the significant growth and development that Schofields and the broader LGA is undergoing. It is reasonable to consider that the construction of the Proposal may coincide with the construction phase of one or more of these upcoming projects. As none of these developments occur in close proximity to the Proposal site, the potential for cumulative impacts is minimised. However, there is potential for cumulative traffic impacts associated with vehicle movements on arterial roads and connecting.

Consultation and liaison would occur with Blacktown City Council, Sydney Trains, and any other developers identified, to minimise cumulative construction impacts such as traffic and noise.

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

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

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

7 Environmental management

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

7.1 Environmental management plans

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

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

7.2 Mitigation measures

Mitigation measures for the Proposal are listed below in Table 15. These proposed measures would minimise the potential adverse impacts of the Proposal identified in Chapter 6 should the Proposal proceed.

Table 15 Proposed mitigation measures

No.	Mitigation measure
	General
1.	A Construction Environmental Management Plan (CEMP) would be prepared by the contractor in accordance with the relevant requirements of *Environmental Management Plan Guideline – Guideline for Infrastructure Projects* (NSW Department of Planning, Industry and Environment, 2020b) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
2.	A project risk assessment including environmental aspects and impacts would be undertaken by the contractor prior to the commencement of construction and documented as part of the CEMP.
3.	An Environmental Controls Map (ECM) would be developed by the contractor in accordance with Transport for NSW's *Guide to Environmental Controls Map* (Transport for NSW, 2019d) for approval by Transport for NSW, prior to the commencement of construction and following any revisions made throughout construction.
4.	Prior to the commencement of construction, all contractors would be inducted on the key project environmental risks, procedures, mitigation measures and conditions of approval.
5.	Site inspections to monitor environmental compliance and performance would be undertaken during construction at appropriate intervals.
6.	Service relocation would be undertaken in consultation with the relevant authority. contractors would mark existing services on the ECM to avoid direct impacts during construction.
7.	Any modifications to the Proposal, if approved, would be subject to further assessment and approval by Transport for NSW. This assessment would need to demonstrate that any environmental impacts resulting from the modifications have been minimised.

No.	Mitigation measure
	Traffic and site access
8.	Prior to the commencement of construction, a Traffic Management Plan (TMP) would be prepared as part of the CEMP and would include at a minimum: • ensuring adequate road signage at construction work sites to inform motorists and pedestrians of the work site ahead to ensure that the risk of road accidents and disruption to surrounding land uses is minimised • maximising safety and accessibility for pedestrians and cyclists • ensuring adequate sight lines to allow for safe entry and exit from the site • ensuring access to railway stations, businesses, entertainment premises and residential properties (unless affected property owners have been consulted and appropriate alternative arrangements made) • managing impacts and changes to on and off street parking and requirements for any temporary replacement provision • parking locations for construction workers away from stations and busy residential areas and details of how this would be monitored for compliance • routes to be used by heavy construction-related vehicles to minimise impacts on sensitive land uses and businesses • details for relocating kiss and ride, taxi ranks and rail replacement bus stops if required, including appropriate signage to direct patrons, in consultation with the relevant bus/taxi operators. Particular provisions would also be considered for the accessibility impaired • measures to manage traffic flows around the area affected by the Proposal, including as required regulatory and direction signposting, line marking and variable message signs and all other traffic control devices necessary for the implementation of the TMP. Consultation with the relevant roads authorities would be undertaken during preparation of the construction TMP. The performance of all project traffic arrangements must be monitored during construction.
9.	Communication would be provided to the community and local residents to inform them of changes to parking, pedestrian access and/or traffic conditions including vehicle movements and anticipated effects on the local road network relating to site works.
10.	Road Occupancy Licences for temporary road closures would be obtained, where required.
11.	Notification of Bridge Street and Altrove Boulevard residents of traffic increases prior to operation of the car park.
12.	Detailed design would investigate the relocation of bus stop on Schofields Road (westbound) to avoid conflict from the construction site entrance from Schofields Road. The relocation of the bus stop would be finalised in consultation with the relevant section within Transport for NSW prior to the commencement of main works.
13.	Detailed design would consider the relocation of the pedestrian crossing further west along Schofields Road to address risk of pedestrian-vehicle collision. Consultation with the relevant sections within Transport for NSW would be undertaken to determine the final location (where reasonable and feasible).
14.	Further sensitivity analysis would be undertaken for the intersection of Veron and Schofields Roads to ensure the traffic treatment delivers an acceptable level of service. Feasible and reasonable design considerations to address capacity issues would be implemented.

No.	Mitigation measure
	Urban design, landscape and visual amenity
15.	An Urban and Landscape Design Plan (ULDP) would be prepared by the contractor, in consultation with Blacktown City Council, and submitted to Transport for NSW for endorsement by the Precincts and Urban Design team, prior to finalisation of the detailed design. The ULDP, at a minimum, would address the following: • the appropriateness of the proposed design with respect to the existing surrounding landscape, built form, behaviours and use-patterns (including consideration of Crime Prevention Through Environmental Design principles). • connectivity with surrounding local and regional movement networks including street networks, other transport modes and active transport networks. Existing and proposed paths of travel for pedestrians and bicycles should be shown • integration with surrounding local and regional open space and or landscape networks. Existing and proposed open space infrastructure/landscape elements should be shown • integration with surrounding streetscape including street trees, entries, vehicle cross overs etc. The ULDP is to include the Public Domain Plan and would provide analysis of the: • landscape treatments and tree planting to integrate with surrounding streetscape • location and design of pedestrian and bicycle pathways, street furniture including relocated bus facilities and lighting equipment • total water management principles to be integrated into the design where considered appropriate • materials, finishes, colour schemes and maintenance procedures including graffiti control for new barriers and fences. The following design guidelines are available to assist and inform the Urban Design Plan for the Proposal: • *Water Sensitive Urban Design Guideline* (Transport for NSW, 2019l) • *NSW Sustainable Design Guidelines -Version 4.0* (Transport for NSW, 2019a).
16.	Light spill from the construction area into adjacent visually sensitive properties would be minimised by directing construction lighting into the construction areas and ensuring the site is not over-lit. This includes the sensitive placement and specification of lighting to minimise any potential increase in light pollution.
17.	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.*
18.	The detailed design of the Proposal would comply with Crime Prevention Through Environmental Design principles.
19.	The worksite would be screened with shade cloth (or similar material, where necessary) to minimise visual impacts from key viewing locations.
20.	Temporary hoardings, barriers, traffic management and signage would be removed when no longer required.
21.	During construction, graffiti would be removed in accordance with Transport for NSW's Standard Requirements.

No.	Mitigation measure
	Noise and vibration
22.	Prior to commencement of works, a Construction Noise and Vibration Management Plan (CNVMP) would be prepared and implemented in accordance with the requirements of the *Interim Construction Noise Guideline* (Department of Environment and Climate Change, 2009), *Construction Noise and Vibration Strategy* (TfNSW, 2019b) and the Noise and Vibration Impact Assessment for the Proposal (EMM Consulting, 2021). The CNVMP would take into consideration measures for reducing the source noise levels of construction equipment by construction planning and equipment selection where practicable.
23.	The CNVMP would outline measures to reduce the noise impact from construction activities. Reasonable and feasible noise mitigation measures which would be considered, include: • regularly training workers and contractors (such as at the site induction and toolbox talks) on the importance of minimising noise emissions and how to use equipment in ways to minimise noise • avoiding any unnecessary noise when carrying out manual operations and when operating plant • ensuring spoil is placed and not dropped into awaiting trucks • avoiding/limiting simultaneous operation of noisy plant and equipment within discernible range of a sensitive receiver where practicable • switching off any equipment not in use for extended periods e.g. heavy vehicles engines would be switched off whilst being unloaded • avoiding deliveries at night/evenings wherever practicable • no idling of delivery trucks • keeping truck drivers informed of designated vehicle routes, parking locations and acceptable delivery hours for the site • minimising talking loudly; no swearing or unnecessary shouting, or loud stereos/radios onsite; no dropping of materials from height where practicable, no throwing of metal items and slamming of doors.
24.	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 works at any one time • directing noise-emitting plant away from sensitive receivers • regularly inspecting and maintaining plant to avoid increased noise levels from rattling hatches, loose fittings etc • using non-tonal reversing/movement alarms such as broadband (non-tonal) alarms or ambient noise-sensing alarms for all plant used regularly onsite (greater than one day), and for any out of hours works • use of quieter and less vibration emitting construction methods where feasible and reasonable.
25.	Works would generally be carried out during standard construction hours (i.e. 7.00 am to 6.00 pm Monday to Friday; 8.00 am to 1.00 pm Saturdays). Any works outside these hours may be undertaken if approved by Transport for NSW or authorised under the *Environmental Planning and Assessment (COVID-19 Development – Infrastructure Construction Work Days No. 2) Order 2020* (whilst the Order is in effect), and the community is notified prior to these works commencing. An Out of Hours Work application form would need to be prepared by the Contractor and submitted to the Transport for NSW Environment and Planning Manager for any works outside normal hours.

No.	Mitigation measure
26.	As per the *Construction Noise and Vibration Strategy* (TfNSW, 2019b), construction activities with special audible characteristics (high noise impact, intensive vibration, impulsive or tonal noise emissions) would be limited to standard hours, starting no earlier than 8am; and to continuous blocks not exceeding three hours each with a minimum respite from those activities and works of not less than one hour between each block, unless otherwise approved by Transport for NSW.
27.	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.
28.	To avoid structural impacts as a result of vibration or direct contact with structures, the proposed works would be undertaken in accordance with the safe work distances outlined in the Noise and Vibration Assessment (EMM Consulting, 2021) and attended vibration monitoring or vibration trials would be undertaken where these distances are required to be challenged.
29.	Vibration (other than from blasting) resulting from construction and received at any structure outside of the project would be managed in accordance with: • for structural damage vibration –British Standard BS 7385-2:1993 Evaluation and measurement for vibration in buildings Part 2 and German Standard DIN 4150:Part 3 – 1999: Structural Vibration in Buildings: Effects on Structures For human exposure to vibration the acceptable vibration - values set out in the *Environmental Noise Management Assessing Vibration: A Technical Guideline* (Department of Environment and Conservation, 2006) which includes British Standard BS 6472-2:1992 *Guide to Evaluation of Human Exposure to Vibration in Buildings (1 Hz to 80 Hz).*
30.	Property conditions surveys would be completed prior to piling, excavation of bulk fill or any vibratory works including jack hammering and compaction for all buildings/structures/roads with a plan distance of 50 metres from the works (unless otherwise determined following additional assessment they are not likely to be adversely affected).
31.	Detailed design should consider the following mitigation measures to reduce noise impacts on Altrove Boulevard: • Restriction of vehicles on Altrove Boulevard through various design options (redesign of access / egress options, provision of a new private access road to Veron Road, etc.) • Receptor mitigation - (at-receiver building treatments).
	Indigenous heritage
32.	All construction staff would undergo an induction in the recognition of Indigenous cultural heritage material. This training would include information such as the importance of Indigenous cultural heritage material and places to the Indigenous community, as well as the legal implications of removal, disturbance and damage to any Indigenous cultural heritage material and sites.

No.	Mitigation measure
33.	If unforeseen Indigenous objects are uncovered during construction, the procedures contained in Transport for NSW's *Unexpected Heritage Finds Guideline* (Transport for NSW, 2019c) would be followed, and works within the vicinity of the find would cease immediately. The contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager so they can assist in co-ordinating next steps which are likely to involve consultation with an Aboriginal heritage consultant, Heritage NSW and the Local Aboriginal Land Council. If human remains are found, work would cease, the site secured and the NSW Police and Heritage NSW notified. Where required, further archaeological investigations and an Aboriginal Heritage Impact Permit would be obtained prior to works recommencing at the location.
	Socio-economic
34.	Sustainability criteria for the Proposal would be established to encourage the contractor to purchase goods and services locally, helping to ensure the local community benefits from the construction of the Proposal.
35.	Feedback through the submissions process would be encouraged to facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
36.	A Community Liaison Plan would be prepared prior to construction to identify all potential stakeholders and best practice methods for consultation with these groups during construction. The plan would also encourage feedback and facilitate opportunities for the community and stakeholders to have input into the project, where practicable.
37.	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.
38.	The community would be kept informed of construction progress, activities and impacts in accordance with the Community Liaison Plan to be developed prior to construction.
	Biodiversity
39.	Disturbance of vegetation would be limited to the minimum amount necessary to construct the Proposal. The mature native tree in the north east of the Proposal site should be retained if possible. Should the tree require removal, provide clearance supervision by an appropriately qualified ecologist, including the inspection for habitat items (for example nests or tree hollows) prior to felling and the supervision of the removal of any habitat items if required.
40.	Tree Protection Zones (TPZs) would be determined by a qualified arborist and established around trees to be retained. Tree protection would be undertaken in line with *AS 4970-2009 Protection of Trees on Development Sites* and would include exclusion fencing of TPZs.
41.	Offsets and/or landscaping would be undertaken in accordance with Transport for NSW's *Vegetation Offset Guide* (Transport for NSW, 2019e) and in consultation with the Blacktown Council, and the owner of the land upon which the vegetation is to be planted.
42.	For new landscaping works, mulching and watering would be undertaken until plants are established.
43.	Weed control measures, consistent with Transport for NSW's *Weed Management and Disposal Guideline* (Transport for NSW, 2019f), would be developed and implemented as part of the CEMP to manage the potential dispersal and establishment of weeds during the construction phase of the project. This would include the management and disposal of weeds in accordance with the *Biosecurity Act 2015.*

No.	Mitigation measure
	Soils and water
44.	Prior to commencement of works, a site-specific Erosion and Sediment Control Plan would be prepared in accordance with the 'Blue Book' *Managing Urban Stormwater: Soils and Construction Guidelines* (Landcom, 2004) and updated throughout construction so it remains relevant to the activities. The Erosion and Sediment Control Plan measures would be implemented prior to commencement of works and maintained throughout construction.
45.	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.
46.	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.
47.	All fuels, chemicals and hazardous liquids would be stored away from drainage lines, within an impervious bunded area in accordance with Australian Standards, EPA Guidelines and Transport for NSW's *Chemical Storage and Spill Response Guidelines* (Transport for NSW, 2019g).
48.	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* (Transport for NSW, 2019g) during the construction phase. All staff would be made aware of the location of the spill kits and be trained in how to use the kits in the case of a spill.
49.	In the event of a pollution incident, works would cease in the immediate vicinity and the contractor would immediately notify the Transport for NSW Project Manager and Transport for NSW Environment and Planning Manager. The EPA would be notified by Transport for NSW if required, in accordance with Part 5.7 of the POEO Act.
50.	The existing drainage systems would remain operational throughout the construction phase.
51.	Should groundwater be encountered during excavation works, groundwater would be managed in accordance with the requirements of the *Waste Classification Guidelines* (EPA, 2014) and Transport for NSW's *Water Discharge and Reuse Guideline* (Transport for NSW, 2019h).
52.	Stockpiles would be located outside flood prone areas and away from existing waterways, order to reduce the potential impacts to surface water systems.
53.	A detailed stormwater design would be undertaken to confirm the potential changes to flooding impacts for surrounding properties which have potential to be affected by changes in flood levels and behaviour as a result of the Proposal. The stormwater design would include adequate measures to ensure that the Proposal would (as far as practicable) avoid any increase in existing flood impacts to surrounding areas/properties and to minimise flood risks within the car park. The potential impacts of climate change on flooding shall be considered to ensure safe access and infrastructure is maintained.
54.	Runoff from the surface of the car park would be treated before discharge into the existing road drainage or waterways.

No.	Mitigation measure
	Waste and contamination
55.	The CEMP must address waste management and would at a minimum: • identify all potential waste streams associated with the works and outline methods of disposal of waste that cannot be reused or recycled at appropriately licensed facilities • detail other onsite management practices such as keeping areas free of rubbish • specify controls and containment procedures for hazardous waste and asbestos waste • outline the reporting regime for collating construction waste data.
56.	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.
57.	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.
58.	All spoil and waste must be classified in accordance with the *Waste Classification Guidelines Part 1: Classifying waste (*EPA, 2014) prior to disposal.
59.	Any concrete washout would be established and maintained in accordance with Transport for NSW's *Concrete Washout Guideline* – draft (Transport for NSW, 2019i) with details included in the CEMP and location marked on the ECM.
60.	The existing stockpile with asbestos-containing material would be removed by Stockland prior to construction. A clearance certificate would be provided to Transport for NSW.
	Sustainability, climate change and greenhouse gases
61.	Detailed design of the Proposal would be undertaken in accordance with the *NSW Sustainable Design Guidelines – Version 4.0* (Transport for NSW, 2019a).
62.	The detailed design process would undertake a compliant carbon foot printing exercise in accordance with Transport for NSW's *Carbon Estimate and Reporting Tool Manual* (Transport for NSW, 2019j) or other approved modelling tools. The carbon footprint would to be used to inform decision making in design and construction.
63.	Due to the Proposal being planned for the short to medium term, the detailed design phase should consider methods to design the car park in a way that maximises the potential for reuse and recycling of decommissioned infrastructure and materials.
64.	The following urban heat island mitigation measures are to be delivered during detailed design and construction: • green infrastructure such as landscaping and trees • Water Sensitive Urban Design (WSUD) technologies such as bio-retention systems (rain gardens) in line TfNSW Water Sensitive Urban Design Guideline (Transport for NSW, 2019l)

No.	Mitigation measure
	Non-Indigenous heritage
65.	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, 2019c) would be followed, and works within the vicinity of the find would cease immediately. The contractor would immediately notify the Transport for NSW Project Manager and the Transport for NSW Environment and Planning Manager so they can assist in co-ordinating the next steps which are likely to involve consultation with an archaeologist and Heritage NSW. Where required, further archaeological work and/or consents would be obtained for any unanticipated archaeological deposits prior to works recommencing at the location.
	Air quality
66.	Air quality management and monitoring for the Proposal would be undertaken in accordance with Transport for NSW's *Air Quality Management Guideline* (Transport for NSW, 2019k).
67.	Methods for management of emissions would be incorporated into project inductions, training and pre-start/toolbox talks.
68.	Plant and machinery would be regularly checked and maintained in a proper and efficient condition. Plant and machinery would be switched off when not in use, and not left idling.
69.	Vehicle and machinery movements during construction would be restricted to designated areas and sealed/compacted surfaces where practicable.
70.	To minimise the generation of dust from construction activities, the following measures would be implemented: • apply water (or alternate measures) to exposed surfaces (e.g. unpaved roads, stockpiles, hardstand areas and other exposed surfaces) • cover stockpiles when not in use • appropriately cover loads on trucks transporting material to and from the construction site and securely fix tailgates of road transport trucks prior to loading and immediately after unloading • prevent mud and dirt being tracked onto sealed road surfaces.
	Cumulative impacts
71.	The potential cumulative impacts associated with the Proposal would be further considered as the design develops and as further information regarding the location and timing of potential developments is released. Environmental management measures would be developed in the CEMP and implemented as appropriate.

8 Conclusion

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

The Proposal would include the following key features:

- an at-grade car park with approximately 700 commuter car parking spaces including five accessible spaces
- additional motorcycle parking spaces
- conversion of fifteen general parking into ten accessible spaces within the existing commuter car park on Bridge Street, outside the station
- a new shared access path from the car park to Schofields Station
- CCTV, lighting and wayfinding Transport Park&Ride infrastructure (i.e. Opal card activated boom gates)
- provision for future electric vehicle charging spaces.

The likely key impacts of the Proposal are as follows:

- an increase in traffic movements in Bridge Street, Schofields Road and Altrove Boulevard
- temporary visual, noise and air quality impacts during construction
- increased traffic with associated noise impacts on residents in Altrove Boulevard
- potential to alter the behaviour of surface water in the vicinity of the car park, increasing run off to Council's stormwater network.

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

The Proposal would also take into account the principles of ESD and sustainability (refer to Section 3.3.3 and Section 4.3). These would be considered during the detailed design, construction and operational phases of the Proposal. This would ensure the Proposal is delivered to maximum benefit to the community, is cost effective and minimises any adverse impacts on the environment.

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Transport for NSW, 2019d, *Guide to Environmental Controls Map*, Sydney

Transport for NSW, 2019e, *Vegetation Offset Guide*, Sydney

Transport for NSW, 2019f, *Weed Management and Disposal Guide*, Sydney

Transport for NSW, 2019g, *Chemical Storage and Spill Response Guidelines*, Sydney

Transport for NSW, 2019h, *Water Discharge and Reuse Guideline*, Sydney

Transport for NSW, 2019i, *Concrete Washout Guideline*, Sydney

Transport for NSW, 2019j *Carbon Estimate and Reporting Tool Manual*, Sydney

Transport for NSW, 2019k, *Air Quality Management Guideline*, Sydney

Transport for NSW, 2019l, *Water Sensitive Urban Design Guideline*, Sydney

Wyndham Prince Consulting Civil Infrastructure Engineers and Project Managers, 2012, *Schofields Precinct Water Cycle Management Strategy Report Incorporating Water Sensitive Urban Design Techniques.* Prepared for Department of Planning and Infrastructure. May 2012.

Appendix A Consideration of matters of National Environmental Significance

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

Matters of NES	Impacts
Any impact on a World Heritage property? There are no World Heritage properties within 1km of the Proposal.	Nil
Any impact on a National Heritage place? There are no National Heritage places within 1km of the Proposal.	Nil
Any impact on a wetland of international importance? There are no wetlands of international importance within 1km of the Proposal.	Nil
Any impact on a listed threatened species or communities? It is unlikely that the development of the Proposal would significantly affect listed threatened species or threatened ecological communities (see Section 6.6).	Nil
Any impacts on listed migratory species? It is unlikely that the development of the Proposal would significantly affect any listed migratory species.	Nil
Does the Proposal involve a nuclear action (including uranium mining)? The Proposal does not involve a nuclear action.	Nil
Any impact on a Commonwealth marine area? There are no Commonwealth marine areas in the vicinity of the Proposal.	Nil
Does the Proposal involve development of coal seam gas and/or large coal mine that has the potential to impact on water resources? The Proposal is for a commuter car park and is not related to coal seam gas or coal mining.	Nil
Additionally, any impact (direct or indirect) on Commonwealth land? The Proposal would not be undertaken on or near any Commonwealth land.	Nil

Appendix B Consideration of clause 228

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

Factor	Impacts
(a) Any environmental impact on a community? There would be some temporary impacts to the community during construction, particularly in relation to traffic, noise, access and air quality. During operation, there would be additional traffic on Schofields Road, Altrove Boulevard and Bridge Street. Traffic noise would likely increase on Altrove Boulevard, particularly during the PM peak. Mitigation measures outlined in Chapter 6 would be implemented to manage and minimise adverse impacts.	Minor
(b) Any transformation of a locality? The Proposal would visibly transform the existing cleared land on the Proposal site for the construction of the Proposal. The Proposal would have a positive contribution to the locality by helping to address the high demand for commuter car parking spaces. The Proposal also provides infrastructure that supports potential growth and provides improved public transport facilities.	Minor
(c) Any environmental impact on the ecosystem of the locality? There would be no impact on the ecosystem of the locality	Nil
(d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality? Some short-term impacts during construction would be anticipated, particularly in relation to noise, traffic and access, and air quality (dust). There would be some minor impacts to visual amenity in particular for residents in the vicinity. During operation the Proposal would have positive impacts to the community through providing commuter car parking with improved access, lighting and safety measures (such as CCTV).	Minor
(e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations? The Proposal site is not located in close proximity to registered heritage items and Aboriginal Heritage items are unlikely to be harmed by the Proposal. The visual impacts from the Proposal are anticipated to be low.	Minor
(f) Any impact on the habitat of protected fauna (within the meaning of the *National Parks and Wildlife Act 1974*)? The Proposal has no impact on the habitat of protected fauna.	Nil
(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 does not endanger any species of animal, plant or other form of life, whether living on land, in water or in the air.	Nil

Factor	Impacts
(h) Any long-term effects on the environment? The Proposal is unlikely to have any long-term effects on the environment.	Nil
(i) Any degradation of the quality of the environment? The Proposal is unlikely to have any degradation of the environment.	Nil
(j) Any risk to the safety of the environment? Earthworks occur adjacent to land identified to be flood affected by the PMF (refer to Section 6.8). The detailed design would consider the potential changes to flooding impacts for areas surrounding the Proposal site.	Minor
(k) Any reduction in the range of beneficial uses of the environment? The Proposal is unlikely to have any reduction in the range of beneficial uses of the environment.	Minor
(l) Any pollution of the environment? The Proposal is unlikely to cause any pollution to the environment provided the recommended mitigation measures are implemented.	Minor
(m) Any environmental problems associated with the disposal of waste? The Proposal is unlikely to cause any environmental problems associated with the disposal of waste. All waste would be managed and disposed of in accordance with the EPA Waste Classification Guidelines (EPA, 2014). Mitigation measures would be implemented to ensure waste is reduced, reused or recycled where practicable.	Nil
(n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply? The Proposal is unlikely increase demands on resources that are or are likely to become in short supply.	Nil
(o) Any cumulative environmental effect with other existing or likely future activities? The cumulative effects of the Proposal are described in Section 6.14. Where feasible, environmental management measures would be co-ordinated to reduce any cumulative construction impacts. The Proposal is unlikely to have any significant adverse long-term impacts.	Nil
(p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions? The Proposal is not located in the coastal zone and would not affect or be affected by any coastal processes or hazards.	Nil

Appendix C EPBC Act Protected Matters Report

Australian Government

Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about Environment Assessments and the EPBC Act including significance guidelines, forms and application process details.

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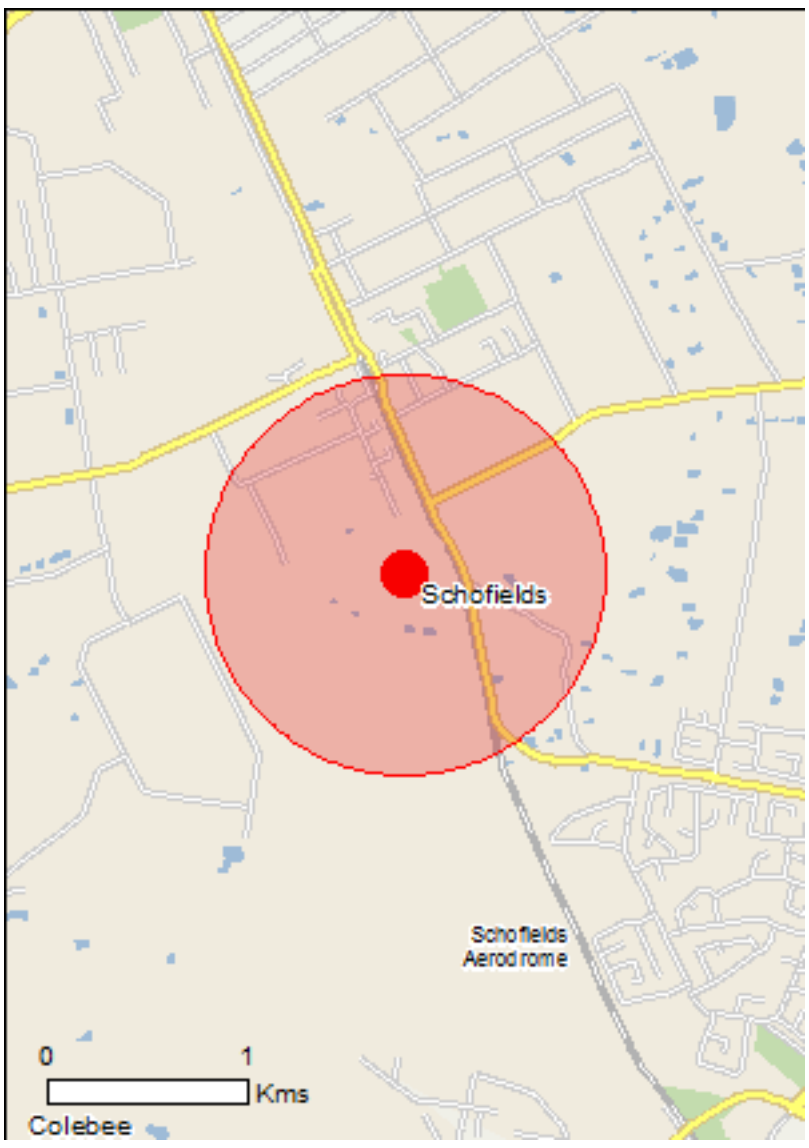

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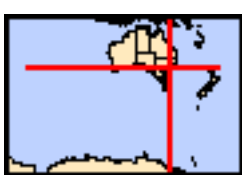

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	6
Listed Threatened Species:	39
Listed Migratory Species:	15

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	21
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	50
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Community may occur within area
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur within area
Cumberland Plain Shale Woodlands and Shale-Gravel Transition Forest	Critically Endangered	Community likely to occur within area
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Community may occur within area
Western Sydney Dry Rainforest and Moist Woodland on Shale	Critically Endangered	Community may occur within area

Listed Threatened Species [Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area
Fish		
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat may occur within area
Frogs		
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat likely to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Acacia bynoeana Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat likely to occur within area
Acacia pubescens Downy Wattle, Hairy Stemmed Wattle [18800]	Vulnerable	Species or species habitat may occur within area
Allocasuarina glareicola [21932]	Endangered	Species or species habitat likely to occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchiid [7528]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat may occur within area
Melaleuca deanei Deane's Melaleuca [5818]	Vulnerable	Species or species habitat may occur within area
Micromyrtus minutiflora [11485]	Vulnerable	Species or species habitat likely to occur within area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat likely to occur within area
Persoonia nutans Nodding Geebung [18119]	Endangered	Species or species habitat may occur within area
Pimelea curviflora var. curviflora [4182]	Vulnerable	Species or species habitat may occur within area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat likely to occur within area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat may occur within area
Pterostylis saxicola Sydney Plains Greenhood [64537]	Endangered	Species or species habitat may occur within area
Pultenaea parviflora [19380]	Vulnerable	Species or species habitat known to occur within area
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur

Name	Threatened	Type of Presence
		within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Name
Defence - HMAS NIRIMBA

Listed Marine Species [Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Chrysococcyx osculans Black-eared Cuckoo [705]		Species or species habitat likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat likely to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Rostratula benghalensis (sensu lato)		
Painted Snipe [889]	Endangered*	Species or species habitat known to occur within area
Tringa nebularia		
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

Invasive Species [Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis		
Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Alauda arvensis		
Skylark [656]		Species or species habitat likely to occur within area
Anas platyrhynchos		
Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis		
European Goldfinch [403]		Species or species habitat likely to occur within area
Carduelis chloris		
European Greenfinch [404]		Species or species habitat likely to occur within area
Columba livia		
Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata		
Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus		
House Sparrow [405]		Species or species habitat likely to occur within area
Passer montanus		
Eurasian Tree Sparrow [406]		Species or species habitat likely to occur within area
Pycnonotus jocosus		
Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Turdus merula Common Blackbird, Eurasian Blackbird [596]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Asparagus asparagoides Bridal Creeper, Bridal Veil Creeper, Smilax,		Species or species

Name	Status	Type of Presence
Florist's Smilax, Smilax Asparagus [22473]		habitat likely to occur within area
Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat may occur within area
Chrysanthemoides monilifera subsp. monilifera Boneseed [16905]		Species or species habitat likely to occur within area
Cytisus scoparius Broom, English Broom, Scotch Broom, Common Broom, Scottish Broom, Spanish Broom [5934]		Species or species habitat likely to occur within area
Dolichandra unguis-cati Cat's Claw Vine, Yellow Trumpet Vine, Cat's Claw Creeper, Funnel Creeper [85119]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat likely to occur within area
Nassella neesiana Chilean Needle grass [67699]		Species or species habitat likely to occur within area
Nassella trichotoma Serrated Tussock, Yass River Tussock, Yass Tussock, Nassella Tussock (NZ) [18884]		Species or species habitat likely to occur within area
Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Sagittaria platyphylla Delta Arrowhead, Arrowhead, Slender Arrowhead [68483]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and		Species or species

Name	Status	Type of Presence
Sterile Pussy Willow [68497]		habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Ulex europaeus Gorse, Furze [7693]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-33.70429 150.87161

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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