



Appendix C

Traffic and Transport Assessment



Sydney Park Junction
Transport and Traffic Assessment

Final
Transport for NSW



Sydney Park Junction

Project No: IA216700
Document Title: Transport and Traffic Assessment
Revision: Final
Date: 21 June 2021
Client Name: Transport for NSW
Project Manager: F Napolitano
Author: C Li / P Truong
File Name: Appendix C - Traffic and Transport Assessment

Jacobs Group (Australia) Pty Limited
ABN 37 001 024 095
Level 7, 177 Pacific Highway
North Sydney NSW 2060 Australia
PO Box 632 North Sydney
NSW 2059 Australia
T +61 2 9928 2100
F +61 2 9928 2444
www.jacobs.com

© Copyright 2021 Jacobs Group (Australia) Pty Limited. The concepts and information contained in this document are the property of Jacobs. Use or copying of this document in whole or in part without the written permission of Jacobs constitutes an infringement of copyright.

Limitation: This document has been prepared on behalf of, and for the exclusive use of Jacobs' client, and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this document by any third party.

Document history and status

Revision	Date	Description	Author	Checked	Reviewed	Approved
01	28/08/2020	Issue to TFNSW for review	CL / PT	PT	A Robinson	D Wagner
02	02/10/2020	Address TFNSW comments	CL	MD	A Robinson	D Wagner
03	16/04/2021	Inclusion of design refinements along Princess Highway and ancillary compounds	CL	MD	D Wagner	D Wagner
Final	21/06/2021	Final Client Issue Revised opening and design years to 2023 and 2033	AA	MD	D Wagner	F Napolitano

Contents

Executive summary.....	iv
1. Introduction	8
1.1 Proposal description.....	8
1.2 Purpose and scope of this report.....	15
1.3 Structure of this report	15
2. Assessment methodology	16
2.1 Overall assessment approach	16
2.2 Movement and place.....	17
2.3 Performance indicators.....	19
2.4 Traffic modelling approach	19
3. Existing traffic and transport environment	21
3.1 Road safety.....	21
3.2 Function and significance of key roads.....	24
3.3 Active transport customers (pedestrians and cyclists)	27
3.4 Public transport customers.....	31
3.5 General traffic and freight customers.....	33
4. Future conditions without the proposal.....	39
4.1 Road safety.....	39
4.2 Future place	39
4.3 Future movement.....	42
5. Assessment of potential impacts.....	55
5.1 Construction.....	55
5.2 Operation	59
6. Mitigation and management measures	73

List of tables

Table ES-1-1 Summary of the traffic and transport assessment approach.....	vi
Table ES-1-2 Mitigation and management measures.....	vii
Table 2-1 Summary of the traffic and transport assessment approach.....	16
Table 2-2 Built environment themes and user outcomes.....	17
Table 2-3 Performance indicators.....	19
Table 2-4 Traffic modelling scenarios	20
Table 2-5 Intersection Level of Service criteria.....	20
Table 3-1 Crashes by reporting year (2014-2018).....	21
Table 3-2 Crashes by contributing factors and conditions (not mutually exclusive) (2014-2018).....	21
Table 3-3 Crashes by injury severity (2014-2018)	22
Table 3-4 Crash rates (2014-2018).....	22
Table 3-5 Crashes by RUM group (not mutually exclusive) (2014-2018)	23
Table 3-6 Top three crash types (2014-2018).....	23
Table 3-7 Formal pedestrian crossing opportunities within the proposal area	27
Table 3-8 Bus routes near the proposal.....	31
Table 3-9 Modelled peak hour existing intersection performance (2019)	37
Table 4-1 Population and employment forecasts (2016-2036).....	41

Table 4-2 Traffic volume changes without the proposal between 2019, 2023 and 2033.....	52
Table 4-3 Modelled peak hour intersection performance without proposal (2023 and 2033).....	53
Table 5-1 Traffic arrangements during construction.....	55
Table 5-2 Cumulative construction impacts	58
Table 5-3 Existing parking and parking with the proposal.....	62
Table 5-4 Traffic volume changes with the proposal between 2019, 2023 and 2033	65
Table 5-5 Modelled peak hour intersection performance with and without the proposal (2023)	66
Table 5-6 Modelled peak hour intersection performance with and without the proposal (2033)	68
Table 5-7 Movement and place performance of the built environment with the proposal.....	70
Table 5-8 Cumulative operation impacts.....	71
Table 6-1 Mitigation and management measures.....	73

List of figures

Figure 1-1 Location of the proposal.....	10
Figure 1-2 Overview of the proposal.....	11
Figure 2-1 Built environment themes and user outcomes	18
Figure 3-1 Crashes by road user (2014-2018).....	24
Figure 3-2 Pedestrian and cycle networks near the proposal.....	29
Figure 3-3 Pedestrian heatmap of Strava users (September 2018 – August 2020)	30
Figure 3-4 Cycling heatmap of Strava users (September 2018 – August 2020)	30
Figure 3-5 Public transport network surrounding the proposal area	32
Figure 3-6 Existing parking conditions.....	34
Figure 3-7 Existing peak hour traffic volumes by direction (2019).....	36
Figure 4-1 Centres within the Eastern City District	40
Figure 4-2 Ashmore Precinct structure plan	41
Figure 4-3 Travel zones used in the population and employment forecast analysis.....	42
Figure 4-4 M8 Motorway, St Peters interchange, M4-M5 Link and Sydney Gateway	43
Figure 4-5 Alexandria to Moore Park Connectivity Upgrade – Stage 1	44
Figure 4-6 Traffic management treatments being progressed as part of the Alexandria local area traffic management plan.....	45
Figure 4-7 Sydney Metro City and Southwest alignment.....	46
Figure 4-8 Planned regional, local and recreational cycling routes near the proposal.....	48
Figure 4-9 Greater Sydney city-serving transport network vision	49
Figure 4-10 Peak hour traffic volumes by direction without proposal (2023 and 2033).....	51
Figure 5-1 Construction vehicle routes	56
Figure 5-2 Peak hour traffic volumes by direction with and without the proposal (2023)	63
Figure 5-3 Peak hour traffic volumes by direction with and without the proposal (2033)	64

Executive summary

Overview of the proposal

Transport for NSW (TfNSW) proposes to improve the southern 'gateway' to King Street, Newtown by reducing the capacity of King Street, Princes Highway and Sydney Park Road, improving pedestrian and cyclist access and urban amenity along these road corridors to Sydney Park, St Peters Station and surrounding neighbourhoods (the proposal). The proposal objectives align with the strategic objectives articulated in the *Greater Sydney Region Plan* (Greater Sydney Commission, 2018), the *Road Safety Plan 2021* (TfNSW, 2018) and the *Future Transport Strategy 2056* (TfNSW, 2018).

The proposal is located about four kilometres south-west of the Sydney Central Business District (CBD), in the suburbs of St Peters, Newtown, Erskineville and Alexandria along the boundary between the Inner West and Sydney local government areas. Key features of the proposal would include:

- Reducing the Princes Highway/King Street carriageway from six lanes (generally) to four lanes (two lanes off-peak) from Campbell Street to Sydney Park Road, to accommodate a two way on-road segregated cycleway (on the western side of King Street between May Street and St Peters square), additional landscaping and community spaces to increase urban amenities
- Reducing the Sydney Park Road carriageway from four lanes to two lanes to accommodate a permanent solution for the existing temporary two-way on-road segregated cycleway (northern side), parking and additional landscaping to increase urban amenities,
- New mid-block pedestrian shared crossings to improve access across the Princes Highway/King Street and into Sydney Park, including:
 - A new mid-block pedestrian crossing on Princes Highway north of Short Street.
 - A new mid-block pedestrian and cyclist crossing on Princes Highway between May Street and Goodsell Street.
- Traffic signal and intersection reconfiguration works to improve safety, including:
 - Princes Highway/King Street and Sydney Park Road intersection:
 - King Street southbound approach: Reduce existing three through lanes and one left turn slip lane to a one through lane and one through/left turn lane
 - King Street northbound approach: Maintain existing two through lanes and reduce existing two dedicated right turn lanes to one lane
 - Sydney Park Road approach: Reduce existing two left turn lanes and two right turn lanes to one left turn lane and one right turn lane
 - Replacing existing signalised pedestrian crossing facilities with signalised shared crossing facilities on all approaches
 - Princes Highway/King Street and Goodsell Street intersection:
 - New raised zebra crossing to prioritise pedestrians at the entrance of Goodsell Street
 - Princes Highway/King Street and May Street intersection:
 - Removing traffic signals and re-configuring May Street to left in and left out only movements with a new raised zebra crossing to prioritise pedestrians at the entrance of May Street
 - Princes Highway/King Street and Barwon Park Road intersection:
 - Installing new traffic signals with new pedestrian crossings

- Sydney Park Road and Mitchell Road intersection:
 - Eastbound approach: Reduce existing two through lanes and one left turn lane to one through lane and a through/left turn lane
 - Westbound approach: Reduce existing one right turn lane, one through lane and one through/left turn lane to one through/right turn lane and one through/left turn lane
 - Mitchell Road approach: Change existing one right turn lane and one right/through/left turn lane to one bus dedicated right turn lane and one through/left turn lane
- Reducing the posted speed limit on Princes Highway from 50 kilometres per hour to 40 kilometres from Campbell Street to Goodsell Street
- Sydney Park carpark access on Kings St will be modified so that Barwon Park Road access will be entry only into the carpark, and King Street will be exit only from the carpark
- Adjustments and relocation of parking spaces along the road corridor
- Road re-surfacing at signalised intersections and along road corridor where required
- Providing dynamic community space for parklets on both sides of Princes Highway
- Providing landscaped buildouts on Sydney Park Road and Princes Highway
- Relocating the bus stops on Princes Highway near the Short Street intersection, and on Sydney Park Road near the Mitchell Road intersection
- Relocating utilities and adjustments to streetlights where required
- Removing the Princes Highway and Sydney Park Road corridors from the approved B-double freight access network
- Adjusting stormwater to accommodate designed works
- Relocating existing VMS and CCTV camera
- Relocating road signs and line marking works
- Temporary construction facilities, including site compounds and an ancillary facility at Burrows Road and Venice Street, Mascot.

High traffic and freight volumes on Princes Highway, the southern end of King Street and Sydney Park Road, combined with limited pedestrian crossing opportunities or cycling access, are presently creating an unsafe environment for all road users. The proposal is required to improve road safety and pedestrian and cyclist access along the King Street, Princes Highway and Sydney Park Road corridors. The proposal would also link the urban environment, Sydney Park, transport and pedestrian and cycling movements in a continuously integrated urban landscape that benefits local communities and visitors.

Approach to transport, traffic and parking assessment

A summary of the methodology used to assess the impact of the proposal on the transport network is provided in Table ES-1-1.

Table ES-1-1 Summary of the traffic and transport assessment approach

Component of traffic and transport assessment	Assessment approach
Impacts on road safety	Analysis of historical 5-year crash data to determine existing crash trends and comparing with likely road safety performance with and without the proposal
Impacts on road network performance	Traffic modelling to determine the performance of the road network with and without the proposal
Impacts on parking	Analysis of existing parking provision and comparing with parking provision during construction and operation of the proposal
Impacts on property access	Analysis of existing access provisions and comparing with access provisions during construction and operation of the proposal
Impacts on public transport	Analysis of proposed changes to public transport operations including bus routes and bus stop infrastructure to determine impacts on public transport customers during construction and operation of the proposal
Impacts on pedestrians and cyclists	Analysis of proposed changes to shared user paths, cycleways, footpaths and pedestrian crossings to determine impacts on access to and availability of pedestrian and cycle infrastructure during construction and operation of the proposal
Impacts on movement and place	Analysis of the impacts of proposed changes on the surrounding built environment during operation of the proposal as per the <i>Practitioner's Guide to Movement and Place</i> (Government Architect NSW (GANSW) and TfNSW, 2020)
Cumulative impacts	Qualitative analysis to determine impacts on the transport network resulting from construction and operation of the proposal in conjunction with other major projects expected to be occurring at the same time, based on current publicly available information

Overview of potential impacts – construction

Potential impacts of the proposal during construction have been identified as follows:

- Minor impacts to pedestrian and cyclists
- Minimal impacts to buses
- Potential increase in travel times on the road network
- Minor impacts to access to properties and businesses.

Cumulative construction impacts are expected to be limited to additional construction vehicles on the road network near the proposal, which would potentially increase travel times on the road network as well as minor impacts to pedestrians and cyclists on Campbell Road and Campbell Street.

Overview of potential impacts – operation

Potential impacts of the proposal during operation have been identified as follows:

- Improved safety for pedestrians and cyclists
- Significantly improved pedestrian movement and place
- Significantly improved cyclist movement
- Minimal impacts to buses
- Reduced on-street kerbside parking on Sydney Park Road, King Street and Princes Highway. Increased on-street kerbside parking, and inclusion of angled parking, on May Street.
- Relatively minor and manageable impacts on general traffic and freight customers when considered in the context of the positive impacts of the proposal on the movement and place performance for active transport customers
- As per the *Practitioner's Guide to Movement and Place*, significantly improved overall movement and place performance of the surrounding built environment.

The cumulative operation impacts of nearby developments or activities include:

- Altered traffic patterns in the proposal area, with Euston Road and Campbell Street / Campbell Road replacing Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo
- Improved traffic flow, road safety and trip reliability along the nearby Alexandria to Moore Park corridor
- Increased demand for travel across all customer modes in and near the proposal area.

Summary of mitigation measures

A summary of mitigation and management measures is provided in Table ES-1-2.

Table ES-1-2 Mitigation and management measures

Impact	Mitigation / management measure	Phase	Responsible party
Public transport network changes during construction	Bus operators, TfNSW, the City of Sydney and Inner West Council (as relevant) would be consulted, and the community would be informed of, any temporary changes to bus stop operation.	Construction	Construction contractor
General traffic and freight performance during construction	Ongoing consultation would be undertaken with Transport Coordination, City of Sydney, Inner West Council, emergency services and bus operators to minimise transport and traffic impacts during construction.	Construction	Construction contractor
General traffic and freight performance during construction	Implement a variable message sign strategy to encourage through and regional traffic to use Euston Road and Campbell Street / Campbell Road instead of Princes Highway and Sydney Park Road.	Construction	Construction contractor
General traffic and freight performance during construction	Construction vehicle movements would be minimised during peak periods.	Construction	Construction contractor
Safety around construction site accesses	Vehicle access to and from construction sites would be managed to ensure pedestrian, cyclist and driver safety. This may require manual supervision, physical barriers and / or temporary traffic control.	Construction	Construction contractor
Construction personnel parking	All construction personnel parking would be provided on site and not on local streets.	Construction	Construction contractor
General traffic and freight performance during operation	An operational traffic review would be undertaken to confirm the operational traffic impacts of the proposal on the surrounding road network. This would be undertaken as part of the ongoing post-opening operational traffic review that has been committed to as part of the WestConnex project.	Operation	TfNSW
General traffic and freight performance during operation	Undertake ongoing network optimisation using the existing traffic signal control system (SCATS) by minimising intersection and midblock delays to ensure travel time savings are achieved to the greatest possible extent.	Operation	TfNSW

1. Introduction

1.1 Proposal description

Transport for NSW (TfNSW) proposes to improve the southern 'gateway' to King Street, Newtown by reducing the capacity of King Street, Princes Highway and Sydney Park Road, improving pedestrian and cyclist access and urban amenity along these road corridors to Sydney Park, St Peters Station and surrounding neighbourhoods (the proposal).

The proposal objectives align with the strategic objectives articulated in the *Greater Sydney Region Plan* (Greater Sydney Commission, 2018), the *Road Safety Plan 2021* (TfNSW, 2018) and the *Future Transport Strategy 2056* (TfNSW, 2018).

The proposal is located about four kilometres south-west of the Sydney Central Business District (CBD), in the suburbs of St Peters, Newtown, Erskineville and Alexandria along the boundary between the Inner West and Sydney local government areas. The location of the proposal is shown in Figure 1-1 and an overview of the proposal is provided in Figure 1-2.

Key features of the proposal would include:

- Reducing the Princes Highway/King Street carriageway from six lanes (generally) to four lanes (two lanes off-peak) from Campbell Street to Sydney Park Road, to accommodate a two way on-road segregated cycleway (on the western side of King Street between May Street and St Peters square), additional landscaping and community spaces to increase urban amenities
- Reducing the Sydney Park Road carriageway from four lanes to two lanes to accommodate a permanent solution for the existing temporary two-way on-road segregated cycleway (northern side), parking and additional landscaping to increase urban amenities,
- New mid-block pedestrian shared crossings to improve access across the Princes Highway/King Street and into Sydney Park, including:
 - A new mid-block pedestrian crossing on Princes Highway north of Short Street.
 - A new mid-block pedestrian and cyclist crossing on Princes Highway between May Street and Goodsell Street.
- Traffic signal and intersection reconfiguration works to improve safety, including:
 - Princes Highway/King Street and Sydney Park Road intersection:
 - King Street southbound approach: Reduce existing three through lanes and one left turn slip lane to a one through lane and one through/left turn lane
 - King Street northbound approach: Maintain existing two through lanes and reduce existing two dedicated right turn lanes to one lane
 - Sydney Park Road approach: Reduce existing two left turn lanes and two right turn lanes to one left turn lane and one right turn lane
 - Replacing existing signalised pedestrian crossing facilities with signalised shared crossing facilities on all approaches
 - Princes Highway/King Street and Goodsell Street intersection:
 - New raised zebra crossing to prioritise pedestrians at the entrance of Goodsell Street
 - Princes Highway/King Street and May Street intersection:
 - Removing traffic signals and re-configuring May Street to left in and left out only movements with a new raised zebra crossing to prioritise pedestrians at the entrance of May Street

- Princes Highway/King Street and Barwon Park Road intersection:
 - Installing new traffic signals with new pedestrian crossings
- Sydney Park Road and Mitchell Road intersection:
 - Eastbound approach: Reduce existing two through lanes and one left turn lane to one through lane and a through/left turn lane
 - Westbound approach: Reduce existing one right turn lane, one through lane and one through/left turn lane to one through/right turn lane and one through/left turn lane
 - Mitchell Road approach: Change existing one right turn lane and one right/through/left turn lane to one bus dedicated right turn lane and one through/left turn lane
- Reducing the posted speed limit on Princes Highway from 50 kilometres per hour to 40 kilometres from Campbell Street to Goodsell Street
- Sydney Park carpark access on Kings St will be modified so that Barwon Park Road access will be entry only into the carpark, and King Street will be exit only from the carpark
- Adjustments and relocation of parking spaces along the road corridor
- Road re-surfacing at signalised intersections and along road corridor where required
- Providing dynamic community space for parklets on both sides of Princes Highway
- Providing landscaped buildouts on Sydney Park Road and Princes Highway
- Relocating the bus stops on Princes Highway near the Short Street intersection, and on Sydney Park Road near the Mitchell Road intersection
- Relocating utilities and adjustments to streetlights where required
- Removing the Princes Highway and Sydney Park Road corridors from the approved B-double freight access network
- Adjusting stormwater to accommodate designed works
- Relocating existing VMS and CCTV camera
- Relocating road signs and line marking works
- Temporary construction facilities, including site compounds and an ancillary facility at Burrows Road and Venice Street, Mascot located on Transport for NSW owned land.

Sydney Park Junction is located at the intersection of two major road conduits (King Street and Sydney Park Road), a significant cultural precinct, public transport infrastructure and one of the city's major green open spaces, Sydney Park.

High traffic and freight volumes on Princes Highway, the southern end of King Street and Sydney Park Road, combined with limited pedestrian crossing opportunities or cycling access, are presently creating an unsafe environment for all road users. The proposal is required to improve road safety and pedestrian and cyclist access along the King Street, Princes Highway and Sydney Park Road corridors. The proposal would also link the urban environment, Sydney Park, transport and pedestrian and cycling movements in a continuously integrated urban landscape that benefits local communities and visitors.



Figure 1-1 Location of the proposal

Sydney Park Junction



JACOBS NSW SPATIAL - GIS MAP file - J:\IE\Projects\04_Eastern\VA21670004_Technical\SHB_GIS\Directory\Templates\Figures\KSG_REF_Main\VA216710_KSG_REF_F002_Proposal_R0.mxd | 18/08/2021

Legend

- Construction footprint
- Railway line
- Road
- B Relocated bus stops
- Detail design
- Pedestrian/shared crossings
- Cycleway

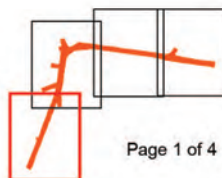


Figure 1-2 Overview of the proposal (page 1 of 4)



Figure 1-2 Overview of the proposal (page 2 of 4)



Legend

- Construction footprint
- Railway line
- Road
- B Relocated bus stops
- Detail design
- Pedestrian/shared crossings
- Cycleway

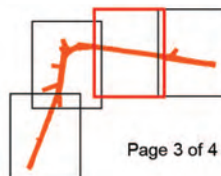


Figure 1-2 Overview of the proposal (page 3 of 4)



Legend

- Construction footprint
- Railway line
- Road
- Relocated bus stops
- Detail design
- Pedestrian/shared crossings
- Cycleway

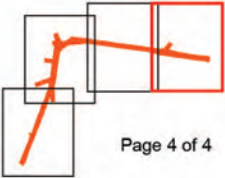


Figure 1-2 Overview of the proposal (page 4 of 4)

1.2 Purpose and scope of this report

This technical paper is one of a number of technical papers that form part of the Review of Environmental Factors (REF). The purpose of this technical paper is to identify and assess the potential impacts of the proposal during construction and operation in relation to transport and traffic.

This report includes the following:

- A review of the existing transport network, including a description of transport infrastructure near the proposal, public transport service provision, pedestrian and cycle networks, and traffic volumes and patterns
- Assessment of the potential transport and traffic impacts of the proposal during construction and operation, including consideration of cumulative impacts
- A suite of measures to mitigate and manage the identified transport and traffic impacts during construction and operation of the proposal.

1.3 Structure of this report

The remainder of this report is structured as follows:

- Chapter 2 documents the assessment methodology including the movement and place and traffic modelling approaches adopted to assess the potential transport and traffic impacts of the proposal during construction and operation
- Chapter 3 details the existing transport and traffic environment
- Chapter 4 provides an assessment of future conditions without the proposal
- Chapter 5 provides an assessment of the potential transport and traffic impacts of the proposal during construction and operation
- Chapter 6 identifies mitigation and management measures.

2. Assessment methodology

2.1 Overall assessment approach

The methodology used to assess the impact of the proposal on the transport network combines the traditional traffic engineering and traffic modelling approach to road network project development and assessment with the movement and place approach to road corridor planning and management that recognises the various functions of the road network.

A summary of the methodology used to assess the impact of the proposal on the transport network is provided in Table 2-1.

Table 2-1 Summary of the traffic and transport assessment approach

Component of traffic and transport assessment	Assessment approach
Impacts on road safety	Analysis of historical 5-year crash data to determine existing crash trends and comparing with likely road safety performance with and without the proposal
Impacts on road network performance	Traffic modelling to determine the performance of the road network with and without the proposal
Impacts on parking	Analysis of existing parking provision and comparing with parking provision during construction and operation of the proposal
Impacts on property access	Analysis of existing access provisions and comparing with access provisions during construction and operation of the proposal
Impacts on public transport	Analysis of proposed changes to public transport operations including bus routes and bus stop infrastructure to determine impacts on public transport customers during construction and operation of the proposal
Impacts on pedestrians and cyclists	Analysis of proposed changes to shared user paths, cycleways, footpaths and pedestrian crossings to determine impacts on access to and availability of pedestrian and cycle infrastructure during construction and operation of the proposal
Impacts on movement and place	Analysis of the impacts of proposed changes on the movement and place performance of the surrounding built environment during operation of the proposal as per the <i>Practitioner's Guide to Movement and Place</i> (Government Architect NSW (GANSW) and TfNSW, 2020)
Cumulative impacts	Qualitative analysis to determine impacts on the transport network resulting from construction and operation of the proposal in conjunction with other major projects expected to be occurring at the same time, based on current publicly available information

2.2 Movement and place

The road network has many functions and people use and experience roads and streets in different ways for different purposes. Road users can be broadly classified into people using the street for movement and people using the street as a place. In recognition of these various functions, the *Practitioner's Guide to Movement and Place* outlines the following aims for roads and streets:

- Balance movement within, to and from, and through places
- Make safer environments
- Improve the amenity of places
- Support the needs of all users
- Use space efficiently
- Support the economy by enabling the movement of goods
- Support sustainable development.

The *Practitioner's Guide to Movement and Place* proposes 5 built environment themes and ten user outcomes that provide a framework for evaluating movement and place performance, which are shown graphically in Figure 2-1 and described in Table 2-2. This report includes a high-level assessment of how the proposal contributes to a well-designed built environment by improving on each aspect of the built environment themes.

Table 2-2 Built environment themes and user outcomes

Built environment theme	Description	User outcomes
Access and Connection	Well-connected places enable urban mobility through access to opportunity, services, and amenities at local, district, metropolitan, and regional levels. Walkable neighbourhoods, cycle routes, and public transport support equitable and accessible movement around and between places.	<ul style="list-style-type: none"> ▪ Mode choice ▪ Reliable transport ▪ Equity (of access)
Amenity and Use	Places for people provide a diversity of public and private spaces to accommodate a variety of activities at different times of day and night, as well as essential and community services. Quality public space is a key component.	<ul style="list-style-type: none"> ▪ Convenient facilities ▪ Local opportunities
Green and Blue	Trees, landscapes, and water are critical infrastructure for greening and cooling our urban and regional places in sustainable ways. As a network they can improve people's comfort and experience of the built environment (e.g. providing shade and connections with nature), and its functional performance (e.g. mitigating flooding), including providing open space for recreation and respite.	<ul style="list-style-type: none"> ▪ A link to nature

Built environment theme	Description	User outcomes
Comfort and Safety	Clear air, sun, shade, peaceful parks, and active building frontages contribute to the liveability of places through environmental comfort including feelings of safety. Road and street environments can cater for all users, without risk of death or serious injury.	<ul style="list-style-type: none"> Comfortable environment Low risk
Character and Form	The identity of a place is perceived through its built form, landscape character, and the contributions of local people over time. Culture and histories, including Aboriginal culture and heritage, shape our everyday environments. The character of each place is different, and an authentic response to that character can contribute to the success of that place.	<ul style="list-style-type: none"> Human-scaled Distinct features

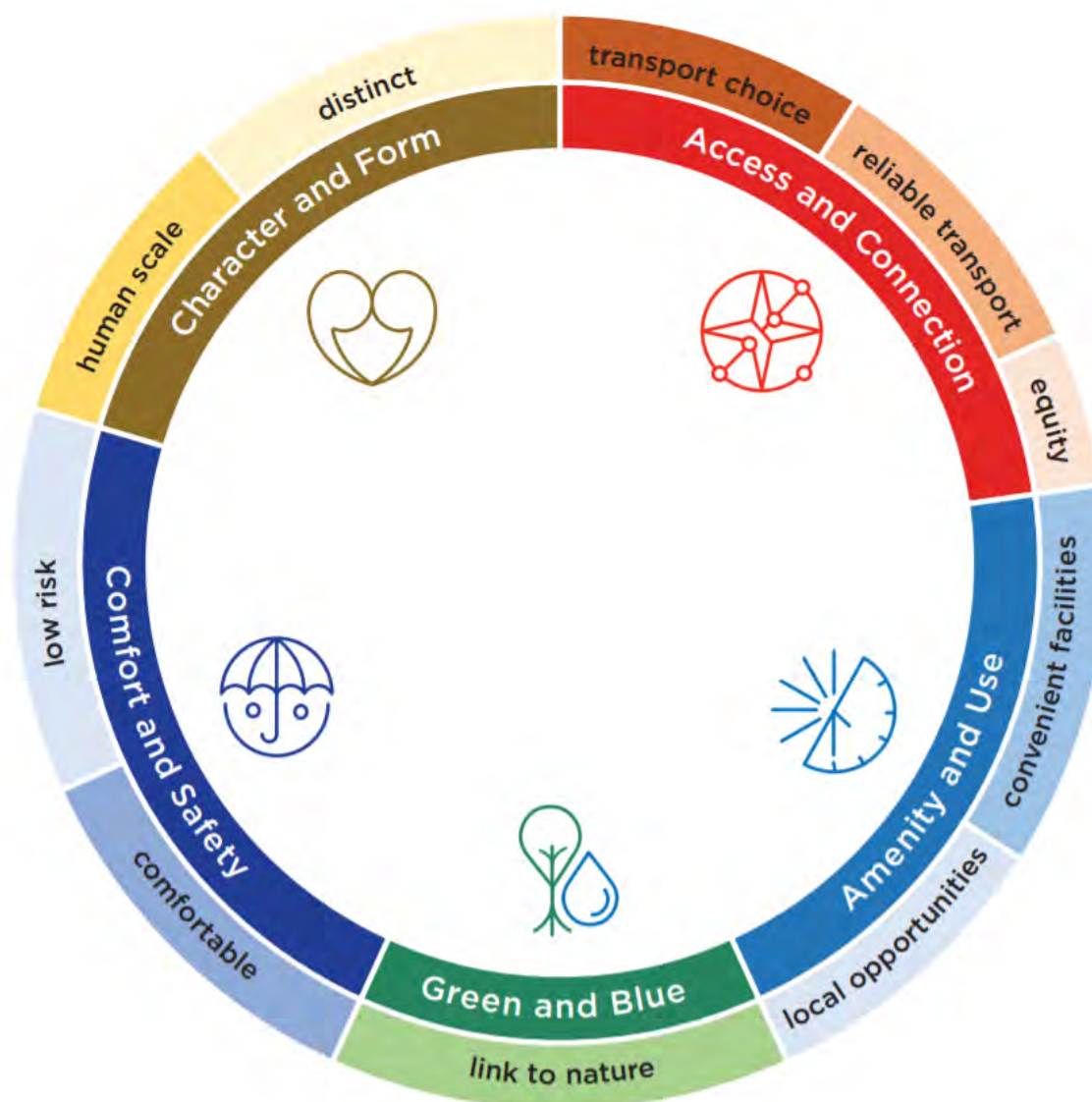


Figure 2-1 Built environment themes and user outcomes

Source: Practitioner's Guide to Movement and Place (GANSW and TfNSW, 2020)

2.3 Performance indicators

The performance indicators that are reported for this assessment are both quantitative and qualitative and are described in Table 2-3. The performance indicators recognise the various functions of the road network and reflect the needs of each road user customer group.

Table 2-3 Performance indicators

Customer group	Performance indicators
General traffic and freight	<ul style="list-style-type: none"> Intersection performance (determined through traffic modelling) On-street parking and freight loading provision
Bus	<ul style="list-style-type: none"> Intersection performance (determined through traffic modelling) Bus stop facilities
Pedestrians	<ul style="list-style-type: none"> Walking comfort and accessibility Pedestrian facilities Crossing opportunities Pedestrian environment and security
Cyclists	<ul style="list-style-type: none"> Cycle connectivity and flow Cycling facilities Cycling difficulty Cycle parking facilities

2.4 Traffic modelling approach

2.4.1 Overview

To assess the impacts of the proposal on road network performance and the movement of general traffic, freight and buses, traffic modelling has been undertaken of the road network in the modelling study area. The modelling study area is the area bounded by Princes Highway, King Street, Sydney Park Road, Euston Road and Campbell Street / Campbell Road.

The approach to traffic modelling undertaken for this assessment aligns with the *Traffic Modelling Guidelines* (Roads and Maritime Services, 2013) and includes the following broad steps:

- Development of calibrated and validated base models to align with existing operational conditions in base year 2019
- Development of future year base models to align with anticipated operational conditions in the assumed year of opening (2023) and 10 years after opening (2033)
- Application of road network changes associated with the proposal to the future year base models to allow the identification of potential impacts to road network performance.

Models were developed using the Vissim traffic modelling software package. Vissim is a microsimulation traffic modelling software package that uses dynamic, stochastic, discrete time modelling techniques to simulate the movement of individual vehicles based on car-following, lane-changing and gap acceptance algorithms that are updated several times every second. These vehicle-to-vehicle interactions provide the basis for calculating delays. Their flexibility allows the modelling of complex traffic operations. The advantage of this type of modelling is that the build-up and dissipation of queues and their effect on surrounding congestion and travel times is sensitively modelled. This type of modelling can provide a better representation of queuing, congestion and delays in at-capacity urban networks compared to static traffic modelling software packages.

Traffic modelling was undertaken for the weekday morning (7 am to 9 am) and evening (4 pm to 6 pm) peak periods only, which is consistent with the standard approach for this type of assessment. The peak traffic periods represent a worst-case scenario, as during these periods the road network experiences the maximum

background traffic demand and the available spare capacity of the road network is at its most limited. A review of Saturday traffic volumes compared to weekday traffic volumes indicates that weekday peak hour traffic volumes are higher than Saturday peak hour traffic volumes. Hence, a quantitative assessment on Saturdays has not been undertaken.

Within the modelled area there are two relatively small car parks (around 100 parking spaces each) which serve Sydney Park. The northern of these car parks is accessed via a signalised intersection off Sydney Park Rd while the eastern car park is accessed via non-signalised intersections on Prices Highway and Barwon Park Road. Due to the size of these car parks, their location and a separate SIDRA assessment of the northern car park; the decision was made to not include either car park in the VISSIM model as their impact on the network would likely be negligible.

2.4.2 Traffic modelling scenarios

A summary of traffic modelling scenarios that were adopted to determine the impacts of the proposal on road network performance is provided in Table 2-4.

Table 2-4 Traffic modelling scenarios

Model year	Without proposal	With proposal	Modelling scenario	Description	Impacts assessed
2019	✓		Existing	The existing road network	N/A
2023	✓		Year of opening without the proposal	The road network with background traffic growth	Performance of the road network at the year of opening without the proposal
2023		✓	Year of opening with the proposal	The road network with background traffic growth and operation of the proposal	Operational impacts on the road network as a result of the proposal
2033	✓		Year of opening + 10 years without the proposal	The road network with background traffic growth	Performance of the road network at 10 years after opening without the proposal
2033		✓	Year of opening + 10 years with the proposal	The road network with background traffic growth and operation of the proposal	Operational impacts on the road network as a result of the proposal

2.4.3 Intersection performance indicators

The performance of a road network is largely dependent on the operating performance of intersections, which form critical capacity control points. The performance indicators that are reported for this assessment include:

- Intersection Level of Service – based on criteria outlined in Table 2-5 and defined in the *Guide to Traffic Generating Developments* (Roads and Traffic Authority, 2002). The average delay assessed for signalised intersections is for all movements. The average delay assessed for priority (sign-controlled or roundabout) intersections is for the worst movement and is expressed in seconds per vehicle.
- Maximum queue length on each approach (in metres) over the assessed hour.

Table 2-5 Intersection Level of Service criteria

Level of Service	Average delay per vehicle (seconds/vehicle)
A	Less than 15
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	Over 70

Source: *Guide to Traffic Generating Developments* (Roads and Traffic Authority, 2002)

3. Existing traffic and transport environment

3.1 Road safety

A review of crash data was undertaken to provide an assessment of safety issues and trends within the proposal area. The crash records used in the assessment comprise the most recent five-year period of finalised crash data, from 1 January 2014 to 31 December 2018. The crash records include Princes Highway / King Street between Sydney Park Road and Campbell Street, and Sydney Park Road between Euston Road / Huntley Street and King Street. The majority of the five-year period of finalised crash data used in the assessment reflects the configuration of the Euston Road / Huntley Street / Sydney Park Road intersection as a roundabout, with the conversion to traffic signals occurring in November 2018.

3.1.1 Crash analysis

In the five-year period from 2014 to 2018, a total of 52 crashes were recorded in the proposal area. Crashes by reporting year are shown in Table 3-1. Key statistics include:

- The majority of crashes (37 crashes) occurred on Sydney Park Road
- The total number of crashes per year shows a generally decreasing trend in the five-year period from 2014 to 2018.

Table 3-1 Crashes by reporting year (2014–2018)

Road	Number of crashes					
	2014	2015	2016	2017	2018	Total
Princes Highway / King Street between Sydney Park Road and Campbell Street	3	4	1	5	2	15
Sydney Park Road between Euston Road / Huntley Street and King Street	11	12	4	8	2	37
Total	14	16	5	13	4	52

Source: TfNSW, Centre for Road Safety (2014–2018)

Crashes by contributing factors and conditions are shown in Table 3-2. Key statistics include:

- 65 per cent of crashes (34 crashes) occurred in daylight and 35 per cent of crashes (18 crashes) occurred at dawn, dusk or in darkness
- Four per cent of crashes (two crashes) occurred in adverse weather conditions
- Six per cent of crashes (three crashes) involved speeding and none involved fatigue as contributing factors.

Table 3-2 Crashes by contributing factors and conditions (not mutually exclusive) (2014–2018)

Road	Contributing factors		Conditions	
	Speed	Fatigue	Adverse weather conditions ¹	Dark lighting conditions ²
Princes Highway / King Street between Sydney Park Road and Campbell Street	0 (0%)	0 (0%)	1 (7%)	6 (40%)
Sydney Park Road between Euston Road / Huntley Street and King Street	3 (8%)	0 (0%)	1 (3%)	12 (32%)
Total	3 (6%)	0 (0%)	2 (4%)	18 (35%)

Source: TfNSW, Centre for Road Safety (2014–2018)

¹ Includes crashes that occurred in rain, fog or mist.

² Includes crashes that occurred at dawn, dusk or in darkness.

Crashes by injury severity are shown in Table 3-3. Key statistics include:

- No crashes resulted in a fatality
- The majority of crashes resulted in an injury (65 per cent of all crashes) with eight resulting in a serious injury (12 per cent)
- Four serious injury crashes were recorded at the Euston Road / Huntley Street / Sydney Park Road intersection and approaches. Three crashes involved a motorcycle and one crash involved a cyclist
- Two serious injury crashes were recorded at the Princes Highway / May Street intersection. One crash involved a cyclist
- Two serious injury crashes were recorded at the Mitchell Road / Sydney Park Road intersection.

Table 3-3 Crashes by injury severity (2014-2018)

Road	Number of crashes					
	Fatal	Serious injury	Moderate injury	Minor injury	Non-casualty	Total
Princes Highway / King Street between Sydney Park Road and Campbell Street	0	2	2	5	6	15
Sydney Park Road between Euston Road / Huntley Street and King Street	0	6	5	14	12	37
Total	0	8	7	19	18	52

Source: TfNSW, Centre for Road Safety (2014-2018)

Fatal and serious injury (FSI) and casualty crash rates were benchmarked against similar types of roads in the Sydney region. The results are shown in Table 3-4. Key statistics include:

- FSI crash rates on Princes Highway / King Street and Sydney Park Road are under the Sydney region average for similar types of road
- Casualty crash rates on Princes Highway / King Street and Sydney Park Road are under the Sydney region average for similar types of road.

Table 3-4 Crash rates (2014-2018)

Road	Length (km)	Average daily traffic volume	FSI crash rate		Casualty crash rate		Casualty crash rate per 100 million vehicle km travelled
Princes Highway / King Street between Sydney Park Road and Campbell Street	0.71	59,500	0.56	↓	2.54	↓	11.68
Sydney Park Road between Euston Road / Huntley Street and King Street	0.82	45,900	1.46	↓	6.10	↓	36.40

Average Sydney region FSI crash rate for similar types of road	1.65
Average Sydney region casualty crash rate for similar types of road	6.68

↑ Above Sydney region average

↓ Below Sydney region average

Source: TfNSW, Centre for Road Safety (2014-2018)

3.1.2 Key crash types and movements

Crashes by road user movement (RUM) group are shown in Table 3-5. The top three crash types on each road are shown in Table 3-6. Key statistics include:

- Overall, the three most common crash types were crashes involving cross-traffic movements (23 per cent of all crashes), rear-end crashes (17 per cent) and right-turn side-swipe crashes (12 per cent). These crash types represent 52 per cent of crashes within the proposal area
- The proportion of crashes involving cross-traffic movements (23 per cent) is higher than the Sydney region average (14 per cent)
- The proportion of right-turn side-swipe crashes (12 per cent) is higher than the Sydney region average (two per cent)
- Nine crashes involving cross-traffic movements were recorded at the Euston Road / Huntley Street / Sydney Park Road intersection. Three of these crashes involved a cyclist. One of these crashes resulted in a serious injury
- Four right-turn side-swipe crashes were recorded at the Euston Road / Huntley Street / Sydney Park Road intersection. One of these crashes resulted in a serious injury
- Three crashes involving vehicles turning right into opposing through traffic were recorded at the King Street / Sydney Park Road intersection. Two of these crashes involved a motorcyclist.

Table 3-5 Crashes by RUM group (not mutually exclusive) (2014-2018)

Road	RUM group										Total
	Pedestrians (00-09)	Adjacent direction (10-19)	Opposing direction (20-29)	Same direction (30-39)	Manoeuvring (40-49)	Overtaking (50-59)	On path (60-69)	Off path on straight (70-79)	Off path on curve (80-89)	Miscellaneous (90-99)	
Princes Highway / King Street between Sydney Park Road and Campbell Street	0	2	2	9	1	0	0	1	0	0	15
Sydney Park Road between Euston Road / Huntley Street and King Street	1	13	3	15	1	0	0	1	3	0	37
Total	1	15	5	24	2	0	0	2	3	0	52

Source: TfNSW, Centre for Road Safety (2014-2018)

Table 3-6 Top three crash types (2014-2018)

Road	Top three crash types
Princes Highway / King Street between Sydney Park Road and Campbell Street	Same direction - 9 crashes (60%) Adjacent direction - 2 crashes (13%) Opposing direction - 2 crashes (13%)
Sydney Park Road between Euston Road / Huntley Street and King Street	Same direction - 15 crashes (41%) Adjacent direction - 13 crashes (35%) Opposing direction - 3 crashes (8%)

Source: TfNSW, Centre for Road Safety (2014-2018)

Crashes by road users are shown in Figure 3-1. Key statistics include:

- 11 per cent of all crashes involved a motorcycle. This is higher than the Sydney region average (eight per cent)
- Seven per cent of all crashes involved a cyclist. This is higher than the Sydney region average (three per cent). 60 per cent of crashes involving cyclists occurred at the Euston Road / Huntley Street / Sydney Park Road intersection.

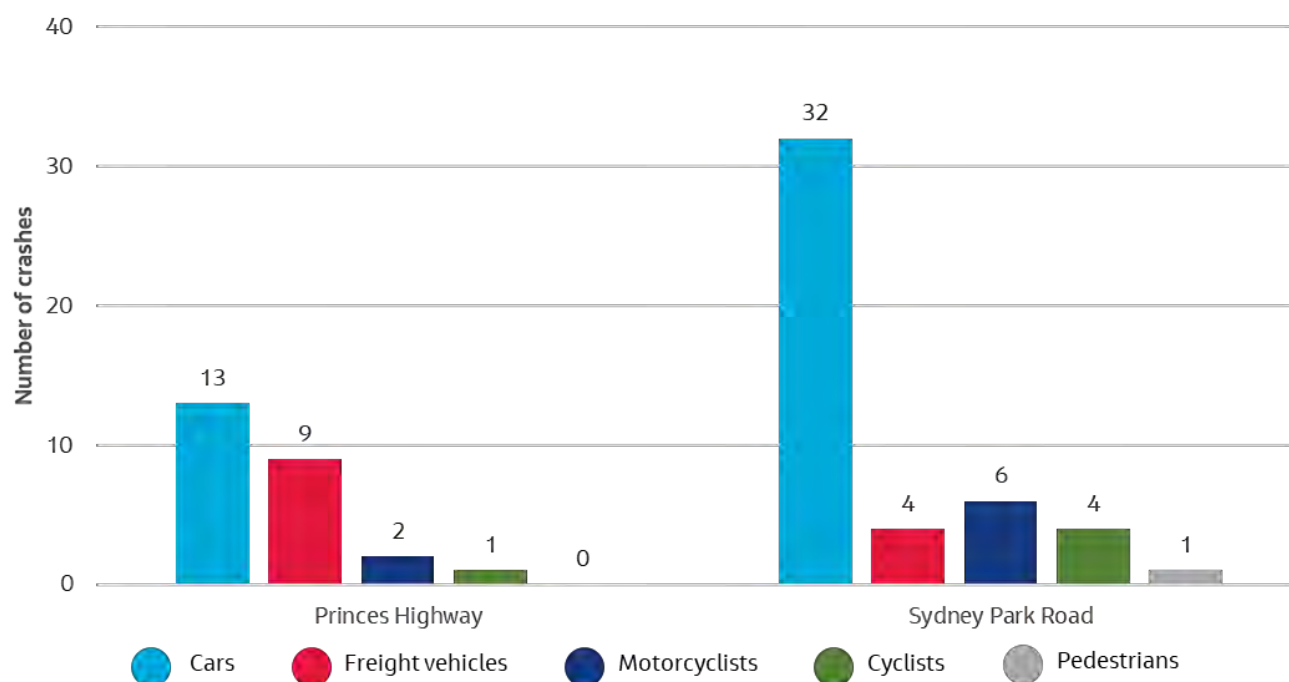


Figure 3-1 Crashes by road user (2014–2018)³

Source: TfNSW, Centre for Road Safety (2014–2018)

3.2 Function and significance of key roads

The function and significance of key roads within the proposal area are discussed below.

King Street

King Street is a state road that provides connectivity to City Road, Enmore Road and Princes Highway through the Newtown activity precinct. King Street is a four-lane single carriageway with a posted speed limit of 50 kilometres per hour. Clearways are operational in the northbound direction in the morning peak period and in the southbound direction during the evening peak period.

King Street is classified as a tertiary freight route. However, the road does not permit 19-metre B-double heavy vehicles and is not part of the general mass limit and higher mass limit networks. The freight function of the road is to facilitate last-mile connectivity for light freight movements travelling to and from the wider freight network.

King Street facilitates city-serving and centre-serving regional bus services that provide public transport access to Sydney CBD and key centres including Green Square, Mascot, Kogarah, Randwick and Newtown. The road also facilitates bus routes which provide feeder services between nearby residential and retail areas and the wider public transport network including Newtown and St Peters train stations.

³ Not mutually exclusive.

King Street has high significance for active transport and facilitates pedestrian access and local cycling to retail and recreational destinations and transport interchanges. King Street has a high place function due to high levels of street activation within the Newtown activity precinct. The adjoining land uses are primarily retail with some mixed-use medium-density residential and education land uses. As such, pedestrian occupancy and dwelling is high along King Street.

Princes Highway

Princes Highway is a state road that connects Ultimo to southern Sydney and the south coast of NSW. Near the proposal, Princes Highway provides north-south connectivity to major east-west corridors including Sydney Park Road, Canal Road, Railway Road and the M8 Motorway. The road is a six-lane dual carriageway with a posted speed limit of 60 kilometres per hour. Clearways are operational in the northbound direction in the morning peak period and in the southbound direction during the evening peak period.

Near the proposal, Princes Highway is classified as a secondary freight route. The road permits the carriage of 25 / 26-metre B-double heavy vehicles as part of the general mass limit and higher mass limit network. Princes Highway provides connectivity for freight movements between industrial areas at St Peters, Sydenham and Tempe, and the wider arterial road and motorway networks.

Princes Highway facilitates city-serving and centre-serving regional bus services that provide public transport access to Sydney CBD and key centres including Green Square, Mascot, Kogarah, Randwick and Newtown. The road also facilitates bus routes which provide feeder services between nearby residential and employment areas and the wider public transport network including St Peters train station.

The function of Princes Highway for active transport is to provide access to key walking and local cycling destinations including nearby public transport interchanges and recreational areas. Pedestrian and cyclist activity is concentrated at the northern end of Princes Highway near St Peters train station and the entrances to Sydney Park. Some pedestrian and cycling activity occurs along the western frontage of Sydney Park, which is a district destination, but activity generally occurs away from the road within Sydney Park itself. Elsewhere, cycling and pedestrian activity is limited as industrial and retail land uses are generally accessed by private vehicle.

Princes Highway has limited active frontages along the road, which are primarily local places. Pedestrian occupancy and dwelling associated with St Peters train station and Sydney Park generally occurs away from the road. The adjoining land uses include medium-density residential and retail, industrial land uses to the south and recreational land uses to the north-east. Within the existing mixed-use land use zoning, redevelopment is currently occurring from industrial to retail and residential land uses along Princes Highway within the proposal area.

Sydney Park Road

Sydney Park Road is a state road that connects Alexandria to the east to King Street to the west. The road functions as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo. Sydney Park Road is a four-lane single carriageway road with a posted speed limit of 60 kilometres per hour.⁴ Clearways are operational in both directions during the weekday morning and evening peak periods.

Sydney Park Road is classified as a secondary freight route. The road permits 25 / 26 metre B-double heavy vehicles as part of the general mass limit and higher mass limit network. Sydney Park Road (as part of the east-west route between St Peters and Moore Park) provides connectivity for freight movements between industrial areas at St Peters, Alexandria and Beaconsfield, and the wider arterial road network.

As with Princes Highway, Sydney Park Road facilitates city-serving and centre-serving regional bus services that provide public transport access to Sydney CBD and key centres including Green Square, Mascot, Randwick and

⁴ As of July 2020, to accommodate the temporary Sydney Park Road pop-up cycleway, Sydney Park Road is a three-lane single carriageway west of Mitchell Road and a four-lane single carriageway east of Mitchell Road with a posted speed limit of 40 kilometres per hour.

Newtown. The road also facilitates bus routes which provide feeder services between nearby residential and employment areas and the wider public transport network including St Peters train station.

The function of Sydney Park Road for active transport is to provide access to key walking and cycling destinations including nearby public transport interchanges and recreational areas, as well as providing connectivity to the wider regional cycle network for access to the Sydney CBD, Redfern, Green Square, Sydney Airport and the Inner West. Pedestrian and cyclist activity is concentrated at the western end near St Peters train station. Some pedestrian and cycling activity occurs along the northern frontage of Sydney Park but the majority of activity occurs away from the road within Sydney Park itself. Elsewhere, cycling and pedestrian activity is moderate due to residential destinations on and near the road.

Sydney Park Road has limited active frontages along the road. The adjoining land uses include medium-density residential to the north and recreational land uses to the south. Pedestrian occupancy and dwelling at locations including Sydney Park and St Peters train station generally occurs away from the road.

Mitchell Road

Mitchell Road is a north-south sub-arterial road that connects Henderson Road at Eveleigh at its northern end and Sydney Park Road at its southern end. The road functions as an alternative parallel route to Euston Road / McEvoy Street and facilitates through traffic access to Waterloo, Redfern and Sydney CBD as well as local access to Erskineville. Near the proposal, Mitchell Road is a two-lane single carriageway with a posted speed limit of 50 kilometres per hour. A mix of timed and unrestricted kerbside parking is permitted on both sides of Mitchell Road. The road is not a designated freight route.

Mitchell Road facilitates city-serving and centre-serving regional bus services that provide public transport access to Sydney CBD and destinations including Marrickville, Leichhardt and Coogee. The road facilitates bus routes which provide feeder services between nearby residential areas and the wider public transport network including St Peters train station.

The land uses adjoining Mitchell Road are low to high-density residential, retail and recreational. The function of Mitchell Road for active transport is to facilitate access to and from these local destinations as well as cycling connectivity to the wider regional cycle network. Mitchell Road has limited active frontages and pedestrian occupancy and dwelling opportunities.

Euston Road

Euston Road is a state road that connects McEvoy Street at its northern end and Campbell Road / M8 Motorway at its southern end. The road functions as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo. The road is a six-lane dual carriageway south of Huntley Street / Sydney Park Road and is a four-lane single carriageway north of Huntley Street / Sydney Park Road. The posted speed limit is 60 kilometres per hour.

Euston Road is classified as a secondary freight route. The road permits short B-double combination vehicles as part of the higher mass limit network. As with Sydney Park Road, Euston Road (as part of the east-west route between St Peters and Moore Park) provides connectivity for freight movements between industrial areas at St Peters, Alexandria and Beaconsfield, and the wider arterial road network. The road does not carry public transport services.

The function of Euston Road for active transport is to provide local access to adjoining residential, retail, industrial and recreational land uses. Some local pedestrian and cycling activity occurs along the eastern frontage of Sydney Park but the majority of activity occurs away from the road within Sydney Park itself. Euston Road has limited active frontages along the road.

Campbell Street / Campbell Road

Campbell Street / Campbell Road is a sub-arterial road and provides east-west connectivity between Bourke Road at Alexandria to the east and Bedwin Road / May Street / Unwins Bridge Road at St Peters to the west. It also provides connection to the M8 Motorway. East of Princes Highway, Campbell Street / Campbell Road is a six-lane dual carriageway road with a posted speed limit of 60 kilometres per hour.

Campbell Street / Campbell Road is not a designated freight route. However, it provides connectivity between the M8 Motorway and industrial areas at St Peters, Alexandria and Mascot. The road does not carry public transport services. The function of Campbell Street / Campbell Road for active transport is to provide local access to adjoining residential and industrial land uses as well as the southern edge of Sydney Park. However, the majority of activity occurs away from the road within Sydney Park itself. Campbell Street / Campbell Road has limited active frontages along the road.

3.3 Active transport customers (pedestrians and cyclists)

Near the proposal, footpaths are provided on both sides of Princes Highway, Sydney Park Road and King Street. Footpaths are generally wide, particularly on King Street, with average footpath widths of over 1.8 metres. On Sydney Park Road an approximately two-metre verge separates the shared path and road and contributes to a comfortable walking environment. However, on Princes Highway there is no separation between the footpath and road except for the eastern side between Sydney Park Road and Barwon Park Road. This contributes to an uncomfortable walking environment due to the 60 kilometres per hour speed limit and high adjacent vehicle flow. There is also no buffer zone between the footpath and road on King Street. However, parking is permitted on sections of Princes Highway and King Street during off-peak periods, acting as an informal buffer zone between pedestrians and passing vehicles. Furthermore, a lower speed limit of 50 kilometres per hour and wide footpaths contribute to a generally comfortable walking environment on King Street.

Formal pedestrian crossing opportunities within the proposal area are shown in Table 3-7. Sections with long distances between formal pedestrian crossing opportunities are located on Princes Highway between Campbell Street and May Street and on Sydney Park Road between King Street and Mitchell Road. Furthermore, pedestrian crossings are missing on one or multiple legs at several intersections within the proposal area.

Table 3-7 Formal pedestrian crossing opportunities within the proposal area

Intersection	Formal pedestrian crossing opportunity	Furthest distance to adjacent formal crossing opportunity (metres)
King Street / Concord Street / Lord Street	Signalised crossings provided on all legs	80
King Street / Sydney Park Road	Signalised crossings provided on all legs	520
Princes Highway / May Street	Signalised crossings on southern and western legs only. Pedestrian ramp not provided on the western side of the crossing on the southern leg	420
Princes Highway / Barwon Park Road	No formal pedestrian crossing opportunity provided	-
Princes Highway / Short Street	No formal pedestrian crossing opportunity provided	-
Princes Highway / Campbell Street	Signalised crossings provided on all legs	420
Euston Road / Huntley Street / Sydney Park Road	Signalised crossing on eastern leg only	280
Mitchell Road / Sydney Park Road	Signalised crossings on eastern and northern legs only	525

The existing cycle network surrounding the proposal is shown in Figure 3-2 and is well-established with provision of off-road shared paths on both sides of Sydney Park Road. These shared paths provide connectivity to the wider regional cycle network for access to the Sydney CBD, Redfern, Green Square, Sydney Airport and the Inner West. However, these shared paths do not meet current off-road shared path minimum width requirements (2.5 metres). The shared paths on Sydney Park Road are currently supplemented by a temporary separated cycleway on the northern side of Sydney Park Road between Mitchell Road and King Street. Off-road shared paths are also provided throughout Sydney Park. In terms of bicycle parking, u-rails are provided at regular intervals on both sides of King Street between Lord Street and Alice Street and service retail / commercial land uses and active frontages within the Newtown activity precinct. Secure bicycle parking spaces are not provided on Princes Highway or Sydney Park Road.

Site observations identified areas of high pedestrian activity at the King Street / Sydney Park Road intersection and along King Street due to pedestrian demand for travel to St Peters train station and high street activation within Newtown activity precinct. Areas of high cyclist and pedestrian activity include the entrances to Sydney Park at the Mitchell Road / Sydney Park Road and Princes Highway / May Street intersections as Sydney Park is a major recreational destination. Low to moderate levels of pedestrian and cyclist activity occur along King Street (south of the rail overbridge), Princes Highway and Sydney Park Road. As shown in Figure 3-3 and Figure 3-4, this is supported by Strava data⁵ which identifies that pedestrians using Strava are concentrated along King Street, Mitchell Road and in and around Sydney Park. Furthermore, cyclists using Strava are concentrated along Sydney Park Road, Princes Highway, King Street and Mitchell Road. No active frontages are present on Sydney Park Road and active frontages along Princes Highway and King Street (south of the rail overbridge) are limited to short sections of retail and commercial land uses near Short Street.

⁵ Strava data is typically used only to inform an understanding of pedestrian and cyclist activity as it only captures the travel patterns of a portion of all active transport users.



Legend

- | | | |
|--|--|--|
| Proposal area | Existing bicycle and pedestrian network | Cycle routes on dedicated cycleways |
| Road | On-road / Off-road cycle route with low traffic volumes | Existing footpath |
| Railway line | On-road cycle route with medium traffic volumes | Existing shared path |
| | On-road cycle route with high traffic volumes | |

Figure 3-2 Pedestrian and cycle networks near the proposal



Figure 3-3 Pedestrian heatmap of Strava users (September 2018 – August 2020)



Figure 3-4 Cycling heatmap of Strava users (September 2018 – August 2020)

3.4 Public transport customers

The proposal is located in close proximity to St Peters train station. St Peters train station is served by Sydney Trains T3 Bankstown Line services, which run between the Sydney CBD and Liverpool / Lidcombe. St Peters train station is served by approximately four to eight services in each direction during the morning and evening peak periods.

Four bus routes operate near the proposal, which provide connections to the Sydney CBD, Bondi Junction, Coogee, Marrickville, Wolli Creek, Rockdale, Kogarah and Leichhardt. There are an additional two NightRide bus routes that replace train services in the late evening and early morning between Town Hall and Sutherland / Cronulla. Bus routes are detailed in Table 3-8 and shown spatially in Figure 3-5.

Within the proposal area, these routes are serviced by two bus stops on Princes Highway and four bus stops on Sydney Park Road. Two bus stops along King Street are located adjacent to the northern end of the proposal area. Bus stop quality, determined by the provision of facilities for bus passengers, is generally acceptable with all bus stops providing a flag and timetable. Most bus stops provide shelter and tactile markers and approximately half provide seating.

Table 3-8 Bus routes near the proposal

Bus route	Number of services (bi-directional)		
	Total weekday	Total Saturday	Total Sunday
308 – Marrickville Metro to Central Eddy Avenue via Redfern	45	27	17
348 – Wolli Creek to Bondi Junction	74	54	44
370 – Leichhardt Marketplace to Coogee	154	109	97
422 – Kogarah to Central Pitt Street	131	96	64
N10 – Town Hall to Sutherland (NightRide)	17	17	9
N11 – Town Hall to Cronulla (NightRide)	8	8	8



Figure 3-5 Public transport network surrounding the proposal area

3.5 General traffic and freight customers

3.5.1 Parking

Near the proposal, public off-street parking is provided at two car parks at Sydney Park. The car parks near Mitchell Road and May Street provide approximately 100 and 90 car spaces, respectively. Both car parks are restricted to four-hour parking on Monday to Friday and unrestricted on weekends.

On-street kerbside parking on Princes Highway, King Street and Sydney Park Road is generally limited. Sections of on-street kerbside parking are permitted at the following locations and times:

- Western side of Princes Highway between Campbell Street and May Street (approximately 241 metres equating to 38 car parking spaces): generally unrestricted kerbside parking outside of weekday morning peak period clearway restrictions (6 am to 10 am). Short section of 30-minute timed parking south of Short Street between 10 am to 6 pm on weekdays and unrestricted otherwise
- Western side of King Street between May Street and Goodsell Street (approximately 40 metres equating to 6 car parking spaces): unrestricted kerbside parking outside of weekday morning peak period clearway restrictions (6 am to 10 am) and no parking (3.30 pm to 5.30 pm on weekdays)
- Eastern side of Princes Highway between Barwon Park Road and Campbell Street (approximately 210 metres equating to 33 car parking spaces): generally unrestricted kerbside parking outside of weekday evening peak period clearway restrictions (3 pm to 7 pm)
- Northern side of Sydney Park Road between east of King Street and west of Mitchell Street (approximately 252 metres equating to 38 car parking spaces): unrestricted kerbside parking on weekends only
 - As of July 2020, this parking has been temporarily removed to accommodate the temporary Sydney Park Road pop-up cycleway. Existing no parking zones on the southern side of Sydney Park Road between east of King Street and west of Mitchell Street (approximately 310 metres) have been temporarily changed to three-hour timed parking between 8 am to 8 pm seven days a week.
- King Street north of Lord Street: mix of timed and unrestricted kerbside parking on both sides outside of weekday morning (6 am to 10 am) and evening (3 pm to 7 pm) peak period clearway restrictions
- Barwon Park Road south of Princes Highway: unrestricted kerbside parking
- May Street west of Princes Highway: mix of timed and unrestricted kerbside parking on both sides
- Goodsell Street west of King Street: mix of timed and unrestricted kerbside parking on both sides.

On and off-street parking and kerbside restrictions within the proposal area are shown in Figure 3-6.



JACOBS NSW SPATIAL - GIS MAP file : J:\IEP\Projects\04_Eastern\IA21670004_Technical\SHB_GIS\Directory\Templates\Figures\KSGO_REP\Specialists\Traffic\IA216710_KSGO_F002_Parking_R3.mxd | 18/06/2021

Legend

- Proposal area
- Road
- Railway line
- No restriction
- No restriction
- Specific no parking restrictions
- No parking (3:30pm-5:30pm Mon-Fri)
- No parking
- No parking Mon-Fri

- Existing parking restrictions
- 1/2 P (10am-6pm)
- 1/2 P 8:30am-6pm Mon-Fri, 8:30am-12:30pm Sat
- 2P 8:30am-6pm Mon-Fri Permit holders excepted Area M12
- 2P parking (10am-3:30 Mon-Fri & 8:30am-12:30pm Sat)

- 3pm-7pm Mon-Fri
- 6:30am-6pm Mon-Fri
- 6am-10am Mon-Fri
- Authorised car share Vehicles Excepted Bay 857
- Bus zone
- Mail zone
- No stopping



1:6,000 @ A4

Figure 3-6 Existing parking conditions

3.5.2 Traffic volumes and patterns

King Street (south of Lord Street) and Princes Highway (north of Campbell Street) carry high volumes of traffic. During the weekday morning peak hour, the peak direction on these roads is northbound with volumes of up to 1860 vehicles per hour in each direction near the proposal. During the weekday evening peak hour, the peak direction is southbound with volumes of up to 2090 vehicles per hour in each direction.

Sydney Park Road carries a high volume of traffic ranging from 580 to 1970 vehicles in each direction during the weekday morning and evening peak hours. Sydney Park Road exhibits a distinct eastbound morning peak direction and westbound evening peak direction due to traffic travelling to and from industrial and employment areas located to the east.

King Street (north of the St Peters railway bridge) carries 700 to 1000 vehicles in each direction during the weekday morning and evening peak hours. King Street does not exhibit a defined peak direction and vehicle volumes are approximately equal during both peak hours.

Mitchell Road carries between 240 and 730 vehicles in each direction with a northbound peak direction during the weekday morning and evening peak hours.

Campbell Street / Campbell Road carries between 340 to 670 vehicles in each direction during the peak hours and exhibits an eastbound peak direction during the morning peak period and a westbound peak direction during the evening peak period. Euston Road carries low volumes of traffic (up to 140 vehicles during the peak hours). It is to be noted that these numbers were derived prior to opening of the M8 Motorway in July 2020. The opening of the motorway is expected to have increased these numbers significantly.

Approximate peak hour midblock volumes on key roads are shown in Figure 3-7.

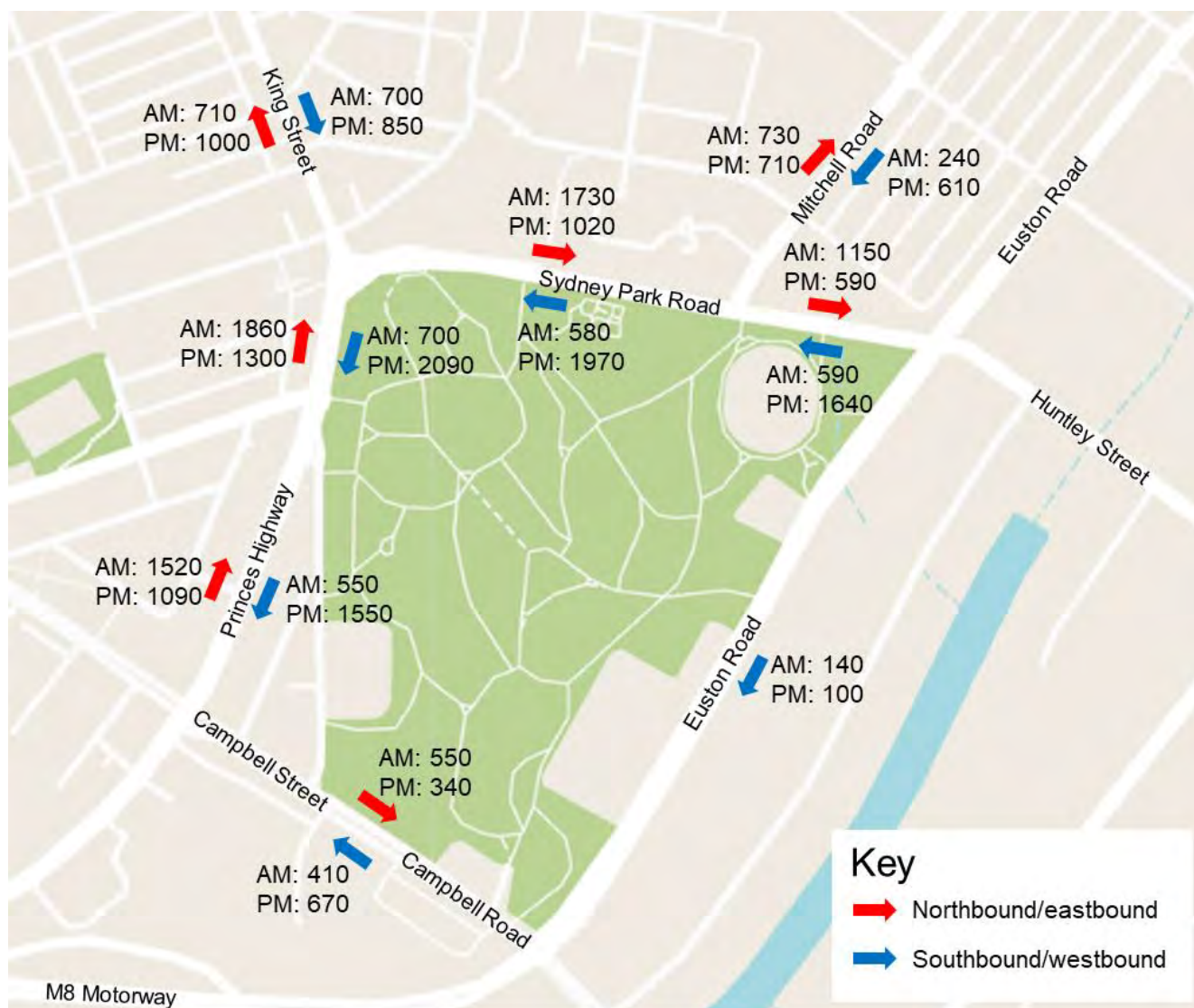


Figure 3-7 Existing peak hour traffic volumes by direction (2019)

3.5.3 Intersection performance

Modelled performance of key intersections in the modelling study area during the weekday morning and evening peak hours is shown in

Table 3-9.

Modelled intersection performance indicates that the following intersections perform at LOS F:

- Princes Highway / May Street during the weekday morning peak hour. This is due to northbound congestion downstream at the King Street / Sydney Park Road intersection where there are high volumes of through traffic conflicting with right-turning and cross-street traffic
- Euston Road / Huntley Street / Sydney Park Road during the weekday morning peak hour. This is due to high volumes of conflicting traffic from the southbound and westbound approaches
- Mitchell Road / Sydney Park Road during the weekday morning peak hour. This is due to high volumes of east-west traffic on Sydney Park Road.

Table 3-9 Modelled peak hour existing intersection performance (2019)⁶

Intersection and peak hour	Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)	
King Street / Sydney Park Road					
Morning	3140	44	D	Northbound	185
				Eastbound	-
				Southbound	60
				Westbound	125
Evening	4120	38	C	Northbound	95
				Eastbound	-
				Southbound	55
				Westbound	400
Princes Highway / May Street					
Morning	2710	88	F	Northbound	440
				Eastbound	335
				Southbound	105
				Westbound	-
Evening	3560	23	B	Northbound	< 5
				Eastbound	70
				Southbound	115
				Westbound	-
Princes Highway / Campbell Street					
Morning	2590	41	C	Northbound	270
				Eastbound	170
				Southbound	75
				Westbound	75
Evening	3240	15	B	Northbound	115
				Eastbound	95
				Southbound	120
				Westbound	110
Euston Road / Huntley Street / Sydney Park Road					
Morning	2010	77	F	Northbound	-
				Eastbound	170
				Southbound	260
				Westbound	270
Evening	2410	30	C	Northbound	-
				Eastbound	90
				Southbound	175
				Westbound	235

⁶ Intersection performance results reflect traffic conditions in 2019 prior to the opening of the M8 Motorway.

Intersection and peak hour	Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)	
Mitchell Road / Sydney Park Road					
Morning	2470	105	F	Northbound	< 5
				Eastbound	510
				Southbound	80
				Westbound	290
Evening	3270	31	C	Northbound	< 5
				Eastbound	165
				Southbound	125
				Westbound	225
Euston Road / Campbell Road					
Morning	620	4	A	Northbound	-
				Eastbound	10
				Southbound	50
				Westbound	< 5
Evening	590	2	A	Northbound	-
				Eastbound	10
				Southbound	25
				Westbound	< 5

4. Future conditions without the proposal

4.1 Road safety

As discussed in Section 3.1, a review of crash data identified the following road safety issues in the proposal area:

- The majority of crashes resulted in an injury (65 per cent of all crashes) with eight resulting in a serious injury (12 per cent)
- The three most common crash types were crashes involving cross-traffic movements (23 per cent of all crashes), rear-end crashes (17 per cent) and right-turn side-swipe crashes (12 per cent). These crash types represent 52 per cent of crashes within the proposal area
- The proportion of crashes involving cross-traffic movements (23 per cent) is higher than the Sydney region average (14 per cent)
- The proportion of right-turn side-swipe crashes (12 per cent) is higher than the Sydney region average (two per cent)
- The proportion of crashes involving motorcycles (11 per cent) is higher than the Sydney region average (eight per cent)
- The proportion of crashes involving cyclists (seven per cent) is higher than the Sydney region average (three per cent). 60 per cent of crashes involving cyclists occurred at the Euston Road / Huntley Street / Sydney Park Road intersection.

Without intervention, it is anticipated that these road safety issues would continue in the long-term.

4.2 Future place

4.2.1 Land use changes near the proposal

Proximity to centres

The proposal is located near, and provides access to, key centres that are identified in the *Eastern City District Plan* (Greater Sydney Commission, 2018). The nearest centres to the proposal are the Newtown, Marrickville and Marrickville Metro local centres to the west, and the Green Square – Mascot strategic centre located further away to the east. Development of these key centres to support population and employment growth is likely to increase the demand for travel for all customer groups on roads in the proposal area.

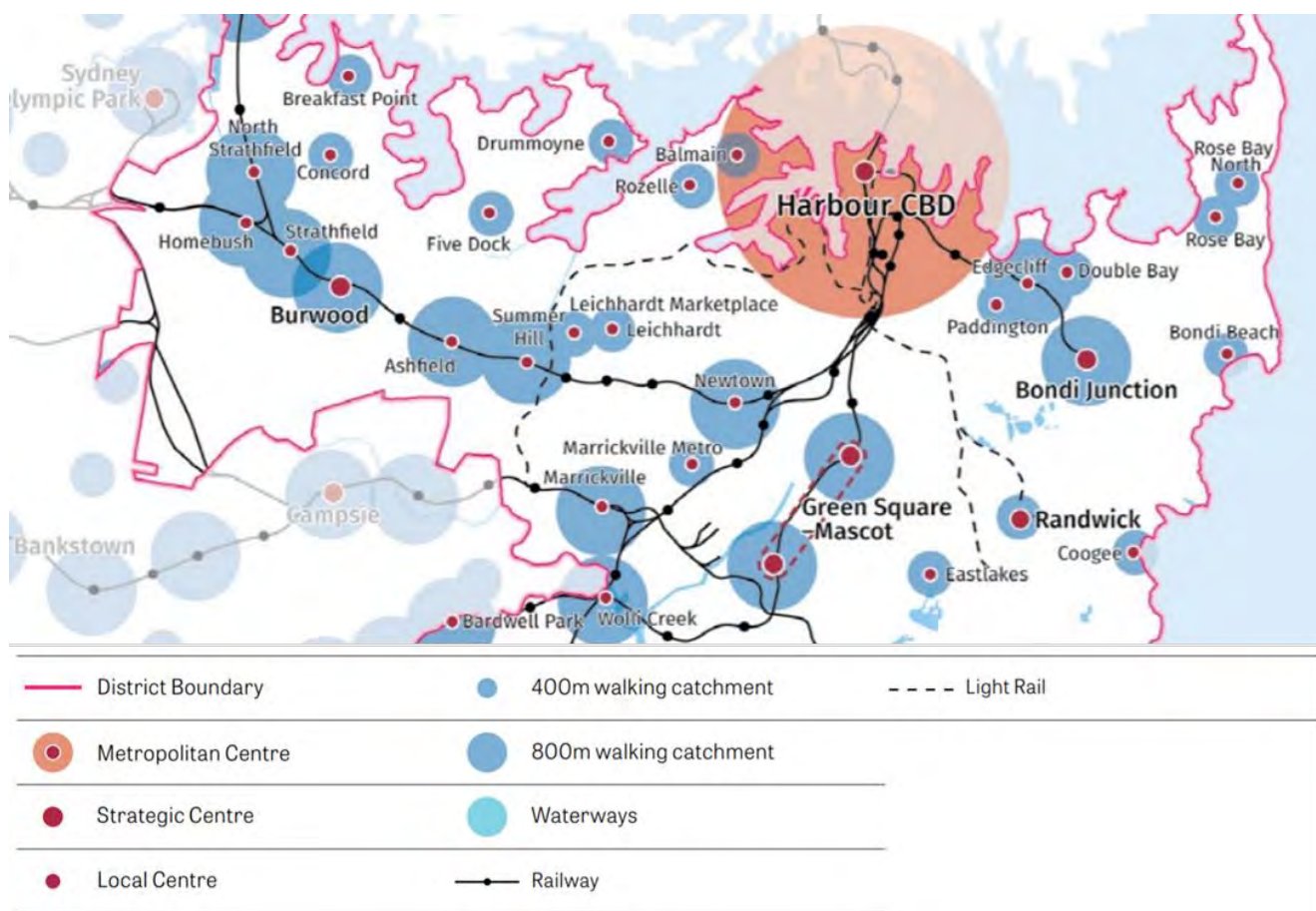


Figure 4-1 Centres within the Eastern City District

Source: Eastern City District Plan (Greater Sydney Commission, 2018)

Ashmore Precinct

The Ashmore Precinct is a 17.4-hectare industrial estate that has been identified for urban renewal including new housing, commercial and retail land uses, community facilities, public open space and active transport facilities. The Ashmore Precinct is located in Erskineville to the north of the proposal and is bounded by Ashmore Street, Mitchell Road, Coulson Street and the railway line. The Ashmore Precinct will provide up to 3500 new dwellings to service approximately 6300 new residents. As of November 2019, the majority of redeveloped lots are either under construction, nearing completion or complete.

It is anticipated that the Ashmore Precinct would generate additional demand for travel for all customer groups on roads in and near the proposal area. The Ashmore Precinct is in close proximity to key destinations including Sydney Park and St Peters train station and is expected to increase pedestrian and cyclist activity in the area, particularly along Sydney Park Road. However, the Ashmore Precinct is located away from Sydney Park Road and is not expected to increase active frontages and pedestrian dwelling opportunities along Sydney Park Road.

The structure plan for the Ashmore Precinct is shown in Figure 4-2.



Figure 4-2 Ashmore Precinct structure plan

Source: South Sydney Development Control Plan Amendment: Urban Design 1997 - Part G Special Precinct No.7 - Ashmore Precinct (City of Sydney, 2006)

Population and employment forecasts

Population and employment forecasts were analysed to quantify the projected growth in population and employment. Forecasts for travel zones within the proposal area are shown in Table 4-1. The travel zones used in the analysis are located within one kilometre of the proposal⁷ and are shown in Figure 4-3.

The forecasts show population growth of approximately 19,400 (47 per cent) between 2016 and 2036, with the highest growth projected within the Mascot and Erskineville travel zones. Moderate population growth is also projected in the St Peters Station South travel zone due to some redevelopment from industrial to residential land uses along Princes Highway within the proposal area. The forecasts show employment growth of approximately 13,700 (20 per cent) between 2016 and 2036, with the highest growth projected within the Mascot and Alexandria travel zones. Population and employment growth is likely to increase the demand for travel for all customer groups on roads in the proposal area.

Table 4-1 Population and employment forecasts (2016-2036)

Year	2016	2026	2016-2026 growth	2016-2026 growth per annum	2036	2016-2036 growth	2016-2036 growth per annum
Population	41,155	53,568	30%	3%	60,540	47%	4%
Employment	68,935	75,981	10%	1%	82,671	20%	2%

Source: Travel Zone Explorer (TfNSW, 2020)

⁷ Travel zones used in the analysis include: 223, 248-251, 254-267, 283, 303, 305, 325, 328-332, 411

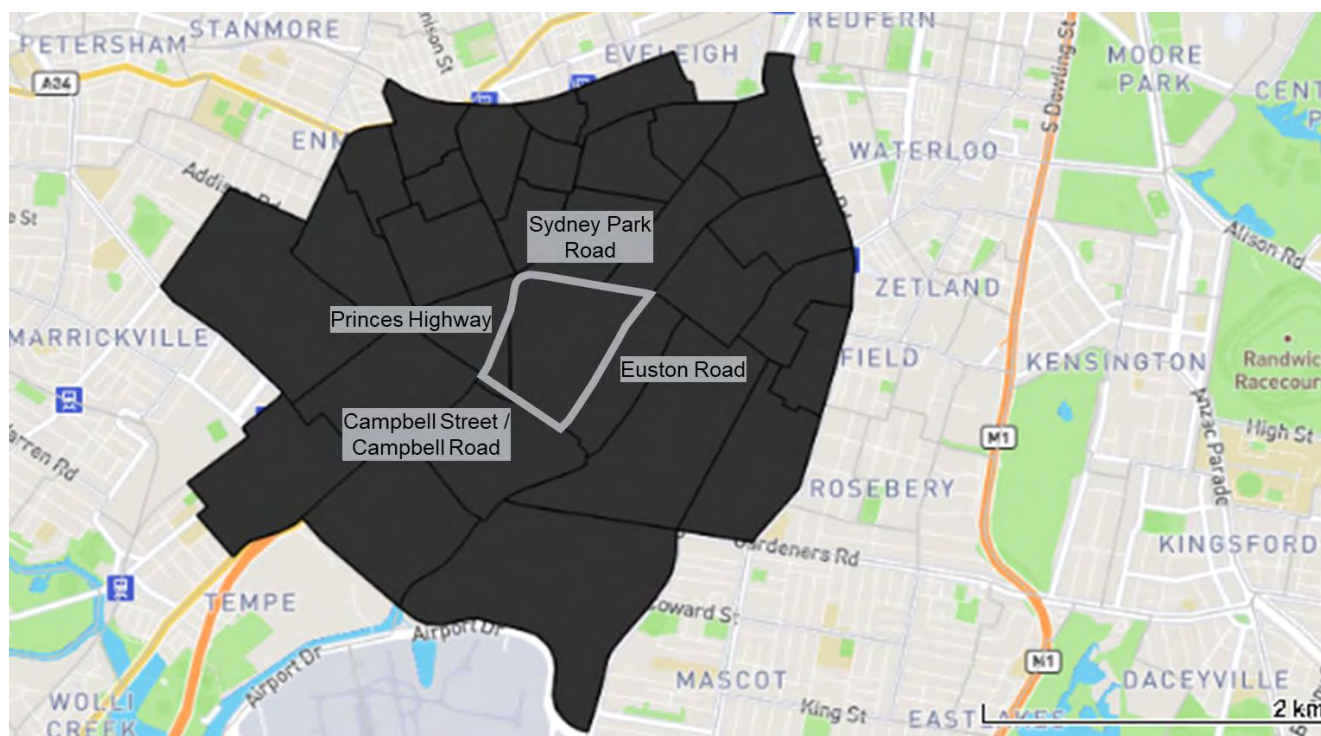


Figure 4-3 Travel zones used in the population and employment forecast analysis

Source: Travel Zone Explorer (TfNSW, 2020)

4.2.2 Summary of future place without the proposal

The future place function of roads near the proposal is not expected to change significantly. Additional active frontages are not proposed along Sydney Park Road and active frontages along Princes Highway would continue to be limited to short sections of retail and commercial land uses near Short Street. Land use developments near the proposal are limited to the Ashmore Precinct and some redevelopment from industrial to retail and residential land uses along Princes Highway within the proposal area. As discussed in Section 4.2.1, the Ashmore Precinct is located away from Sydney Park Road and is not expected to increase active frontages and pedestrian dwelling opportunities along Sydney Park Road. King Street is expected to retain its existing high levels of street activation and would continue to have a high place function.

4.3 Future movement

4.3.1 Committed transport projects near the proposal

WestConnex and Sydney Gateway

WestConnex and Sydney Gateway are integrated motorway projects that aim to provide faster, safer and more reliable journeys across Greater Sydney. Near the proposal, the WestConnex M8 Motorway and St Peters interchange opened in July 2020, and the WestConnex M4-M5 Link and Sydney Gateway are currently under construction and are expected to open in 2022 and 2023, respectively. These are shown spatially in Figure 4-4.

The M8 Motorway is a nine-kilometre tunnel that duplicates connects the existing M5 East from Kingsgrove to St Peters interchange. St Peters interchange provides surface connections to Gardeners Road (via a bridge over Alexandria Canal), Campbell Road and Euston Road, and will provide underground connections to the M4-M5 Link, M6 Stage 1 and Sydney Gateway. The M4-M5 Link will consist of twin 7.5-kilometre mainline motorway tunnels between the M4 East at Haberfield and the New M5 at St Peters and sized to accommodate up to four lanes of traffic in each direction. The tunnels will also include a new interchange at Rozelle that would connect the M4-M5 Link tunnels with City West Link, Anzac Bridge, Iron Cove Link and the proposed future Western

Harbour Tunnel and Beaches Link. Sydney Gateway will provide direct high-capacity road connections linking the Sydney motorway network at the St Peters interchange with Sydney Airport and Port Botany. Stage 1 of Sydney Gateway will comprise a new high-capacity four-lane road in each direction connecting the St Peters interchange with Sydney Airport's International Terminal and Qantas Drive. Stage 3 will include a high-capacity connection between Sydney Airport's Domestic Terminals and St Peters interchange.

The opening of the M8 Motorway, Sydney Gateway, St Peters interchange, related surface road connections and related surface road upgrades are expected to alter traffic patterns in the proposal area, with Euston Road and Campbell Street / Campbell Road replacing Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo.

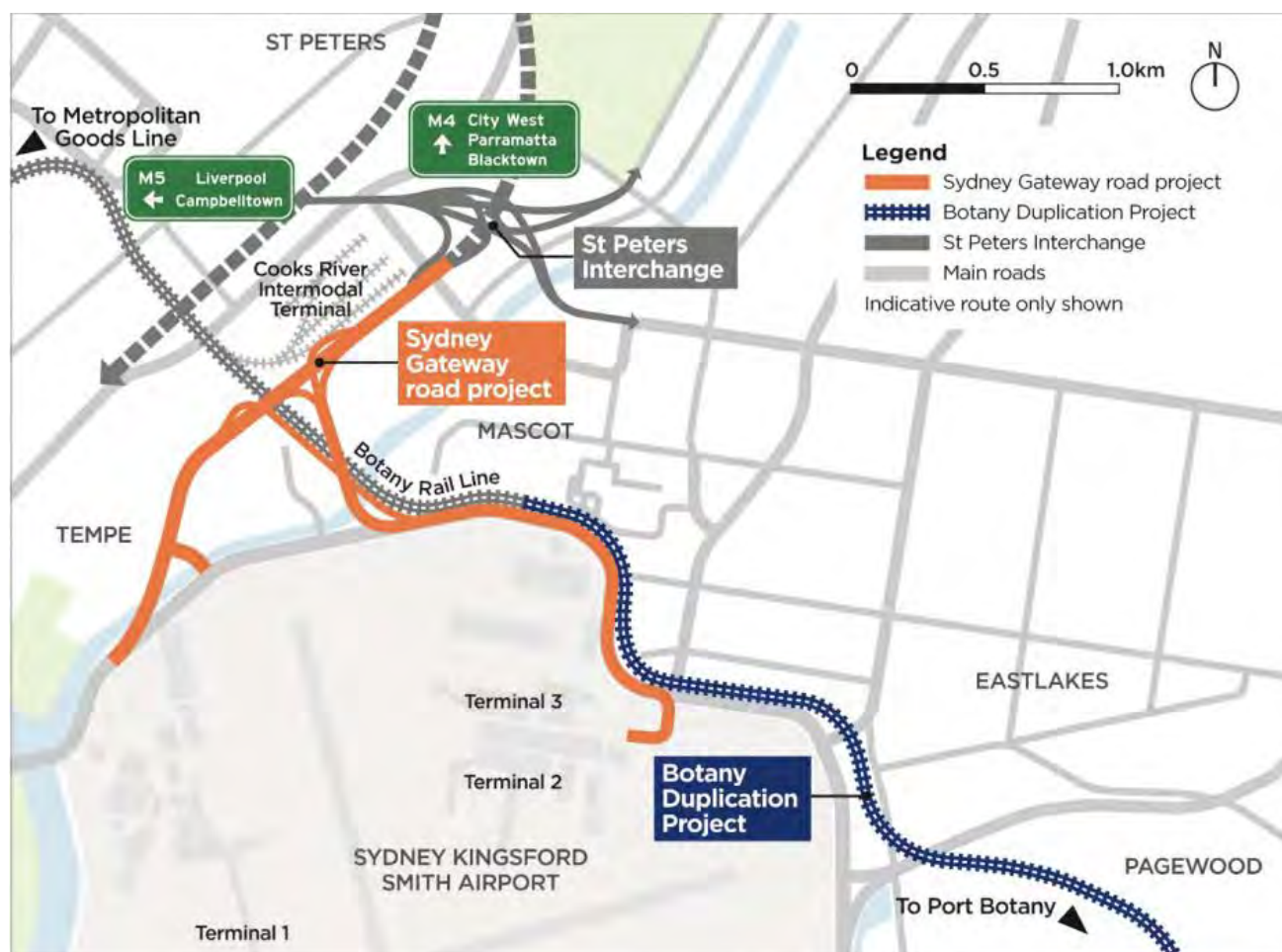


Figure 4-4 M8 Motorway, St Peters interchange, M4-M5 Link and Sydney Gateway

Source: Sydney Gateway Road Project Environmental Impact Statement (Roads and Maritime Services / Sydney Airport Corporation Limited, 2019)

Alexandria to Moore Park Connectivity Upgrade

The Alexandria to Moore Park Connectivity Upgrade is located to the north-east of the proposal and involves intersection, safety and amenity improvements along the Alexandria to Moore Park corridor (Euston Road, McEvoy Street, Lachlan Street, Dacey Avenue and Alison Road). The project aims to improve traffic flow and facilities for pedestrians and cyclists to support urban renewal, and interfaces with major projects within the corridor.

An upgrade of the full corridor would be delivered in stages. Stage 1 focusses on construction of new right and left turn lanes on McEvoy Street at Fountain Street, and a new right turn lane on Botany Road at McEvoy Street. These improvements would be supported with new clearways and additional right turn bans into local streets along the corridor. Minor improvements are also planned at Elizabeth Street / McEvoy Street and at South Dowling Street / Lachlan Street / Dacey Avenue. Future stages would be subject to the availability of funding and broader NSW Government priorities. Stage 1 is shown in Figure 4-5.

The project connects to the upgraded Euston Road, which leads to St Peters interchange, M8 Motorway and upgraded Campbell Street / Campbell Road. The project reinforces the replacement of Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) with Euston Road and Campbell Street / Campbell Road as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo.

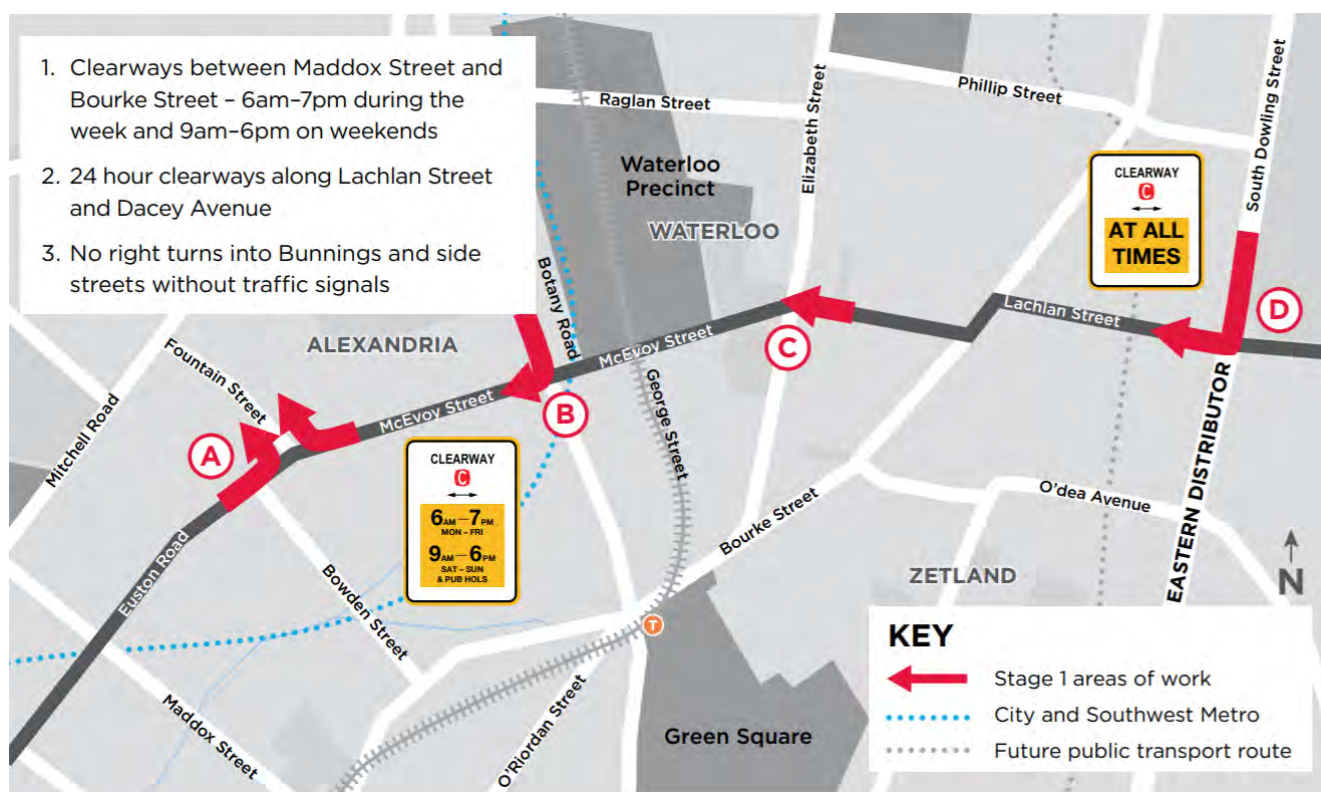


Figure 4-5 Alexandria to Moore Park Connectivity Upgrade – Stage 1

Source: Alexandria to Moore Park Stage 1 Project Update November 2019 (Roads and Maritime Services, 2019)

Alexandria local area traffic management plan

The Alexandria local area traffic management plan is a series of traffic management treatments being developed and implemented by the City of Sydney. The treatments aim to minimise the potential impacts of forecast additional traffic from St Peters interchange on the local road network in Alexandria and would reinforce the use of Euston Road and McEvoy Street for regional through traffic.

Following a consultation period in 2020, the following treatments are being progressed:

- Closure of Anderson Street at Mitchell Road
- Closure of Brennan Street at McEvoy Street
- Closure of Loveridge Street at McEvoy Street
- Midblock closure of Lawrence Street between Maddox Street and Harley Street
- Continuous footpath treatment on Renwick Street at Mitchell Road (completed August 2020).

The locations of these treatments are shown in Figure 4-6.



Figure 4-6 Traffic management treatments being progressed as part of the Alexandria local area traffic management plan

Sydney Metro City and Southwest

Sydney Metro City and Southwest is a new railway line that will connect the existing Sydney Metro network from Chatswood to Sydenham via new metro stations and a conversion of the existing T3 Bankstown Line for metro services. The project is currently under construction with target completion in 2024. The proposed Waterloo and Sydenham metro stations are located within 1.6 kilometres of the proposal and are anticipated to facilitate significant mode shift from general traffic to rail (and supporting bus services).

The alignment of Sydney Metro City and Southwest in the context of the wider Sydney Metro network is shown in Figure 4-7.

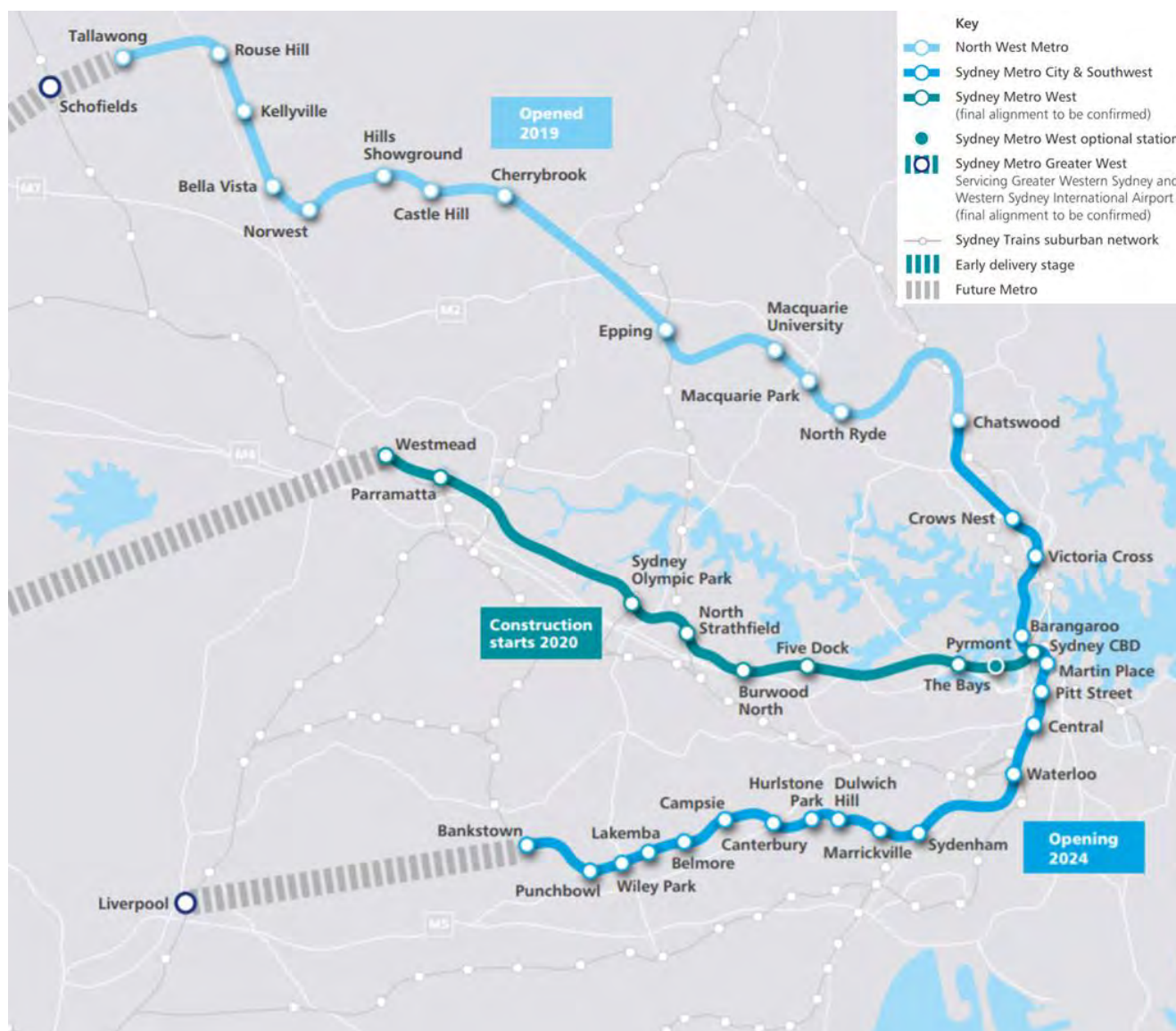


Figure 4-7 Sydney Metro City and Southwest alignment

Source: Sydney Metro Interactive Train Map (Sydney Metro, 2020)

4.3.2 Future transport network operations

Walking

A key customer outcome that is linked to sustaining and enhancing the liveability of places, as identified in the *Greater Sydney Services and Infrastructure Plan* (TfNSW, 2018), is to make walking and cycling the most convenient option for short trips around centres and local areas, supported by a safe road environment and suitable pathways.

The Greater Sydney Green Grid, which is a key objective of the *Greater Sydney Region Plan – A Metropolis of Three Cities* (Greater Sydney Commission, 2018), is a long-term vision for a network of high-quality green areas – from regional parks to local parks and playgrounds – that connect centres, public transport and public spaces to green infrastructure and landscape features. Within the public realm, it includes enhanced waterway corridors, transport routes, suburban streets, footpaths and cycleways.

The following routes in or near the proposal area are identified as part of the Greater Sydney Green Grid:

- Illawarra Rail Line: Wolli Creek to Redfern
- Alexandra Canal
- Bourke Street and George Street Active Transport Green Links.

The *Walking Strategy and Action Plan* (City of Sydney, 2015) outlines walking priorities to align with the objectives of the *Sustainable Sydney 2030* (City of Sydney, 2014) plan. The plan is focussed on four priorities and 10 targets to provide greater priority, safety and amenity for pedestrians. The plan identifies Sydney Park Road between Mitchell Road and King Street as part of the primary walking network. In addition, King Street is identified as a main activity street with the following targets:

- Increase footpath capacity by 20 per cent on average on main activity streets through planned upgrades
- Improve walking amenity by 10 per cent on main activity streets through planned upgrades.

Cycling

The *Greater Sydney Services and Infrastructure Plan* describes an aspirational Principal Bicycle Network, which is a network of major bicycle corridors across Greater Sydney. In addition to supporting longer distance cycling journeys, individual components have an important role in supporting shorter distance city-serving and centre-serving journeys. The Principal Bicycle Network will be important in improving cycling access within 10 kilometres of metropolitan centres including the Harbour CBD. This is a key component of achieving Customer Outcome 3 of the *Greater Sydney Services and Infrastructure Plan* – walking or cycling is the most convenient option for short trips around centres and local areas, supported by a safe road environment and suitable pathways.

The *Cycling Strategy and Action Plan 2018-2030* (City of Sydney, 2018) outlines priorities to achieve the City of Sydney's *Sustainable Sydney 2030* target of 10 per cent cycling mode share. Priority 1 - 'Connecting the network' is described as follows: *We are building a safe bike network connecting people and destinations, suitable for all ages and abilities, within 250 metres of all residents. It will serve workers, students, residents and visitors travelling in, to or through the city.*

As part of priority 1, the plan outlines planned cycling routes within the City of Sydney local government area to serve regional and local journeys. Planned regional and local cycling routes near the proposal are shown in Figure 4-8 and include:

- Regional route along Sydney Park Road between Mitchell Road and King Street, connecting to planned regional routes along Mitchell Road and Huntley Street and the existing regional route along Belmont Street
- Local route along Sydney Park Road between Euston Road / Huntley Street and Mitchell Road, connecting to planned local routes along Euston Road and Huntley Street.

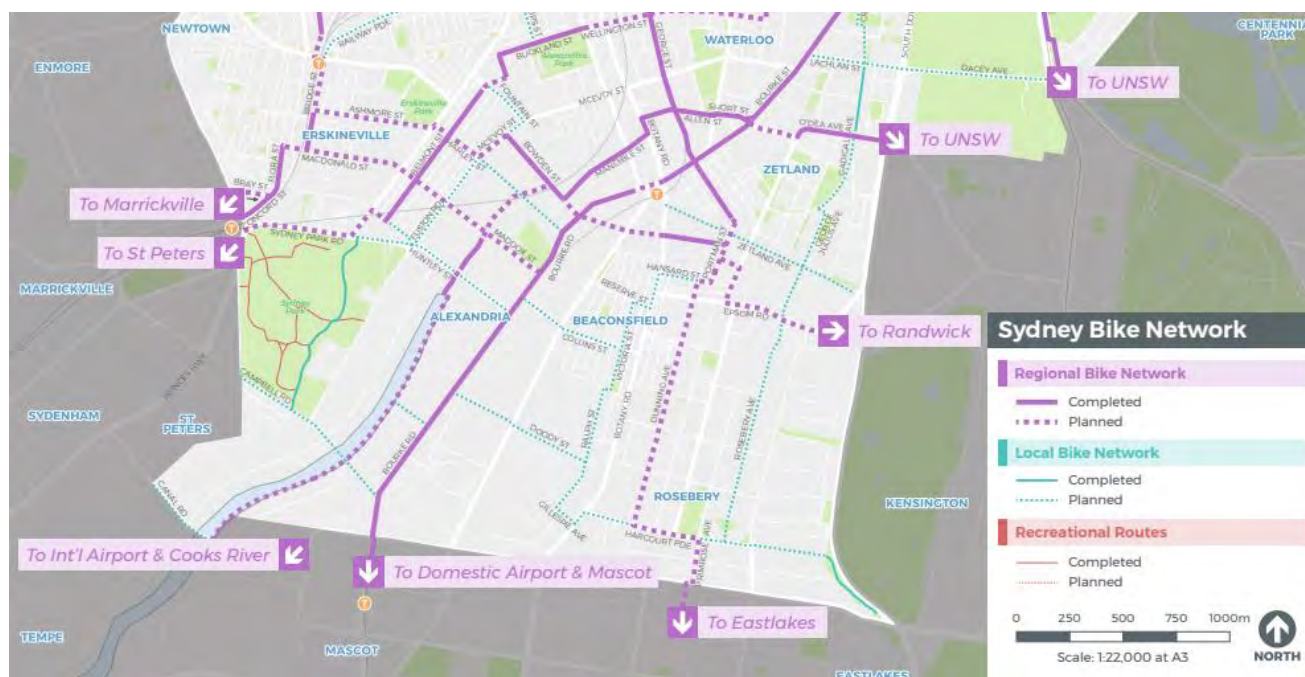


Figure 4-8 Planned regional, local and recreational cycling routes near the proposal

Source: *Cycling Strategy and Action Plan 2018-2030* (City of Sydney, 2018)

Public transport

The *Greater Sydney Services and Infrastructure Plan* describes aspirational future city-shaping and city-serving public transport networks in 2056 (shown in Figure 4-9). The city-shaping network includes higher-speed and volume links between the three cities and other centres. The function of this network is to enable people living in any of the three cities to access their nearest metropolitan centre within 30 minutes and to be able to travel efficiently between these metropolitan centres.

Existing 30-minute public transport accessibility near the proposal is mainly facilitated by Sydney Trains services and bus services that travel within and near the proposal area. Mode shift towards public transport is likely to occur as 30-minute public transport accessibility improves in line with city-serving and city-shaping corridors gradually becoming operational over the next 40 years. As discussed in Section 4.3.1, the proposal is also in proximity to Sydney Metro City and Southwest which includes new metro stations at Waterloo and Sydenham. The metro is anticipated to facilitate significant mode shift near the proposal from general traffic to rail (and supporting bus services).

The city-serving network provides on-demand or high-frequency services to customers within 10 kilometres of metropolitan centres. These typically higher-density areas accommodate residential areas, jobs, services and social facilities. Providing a dense network of transport services within these areas is important for servicing these areas and providing access to nearby metropolitan centres. The city-serving network enables greater density within this area by maintaining convenient and reliable connectivity. The proposal is located near the following city-shaping and city-serving corridors:

- Harbour CBD to Sydney Airport
- Harbour CBD to Sutherland
- Harbour CBD to Liverpool.

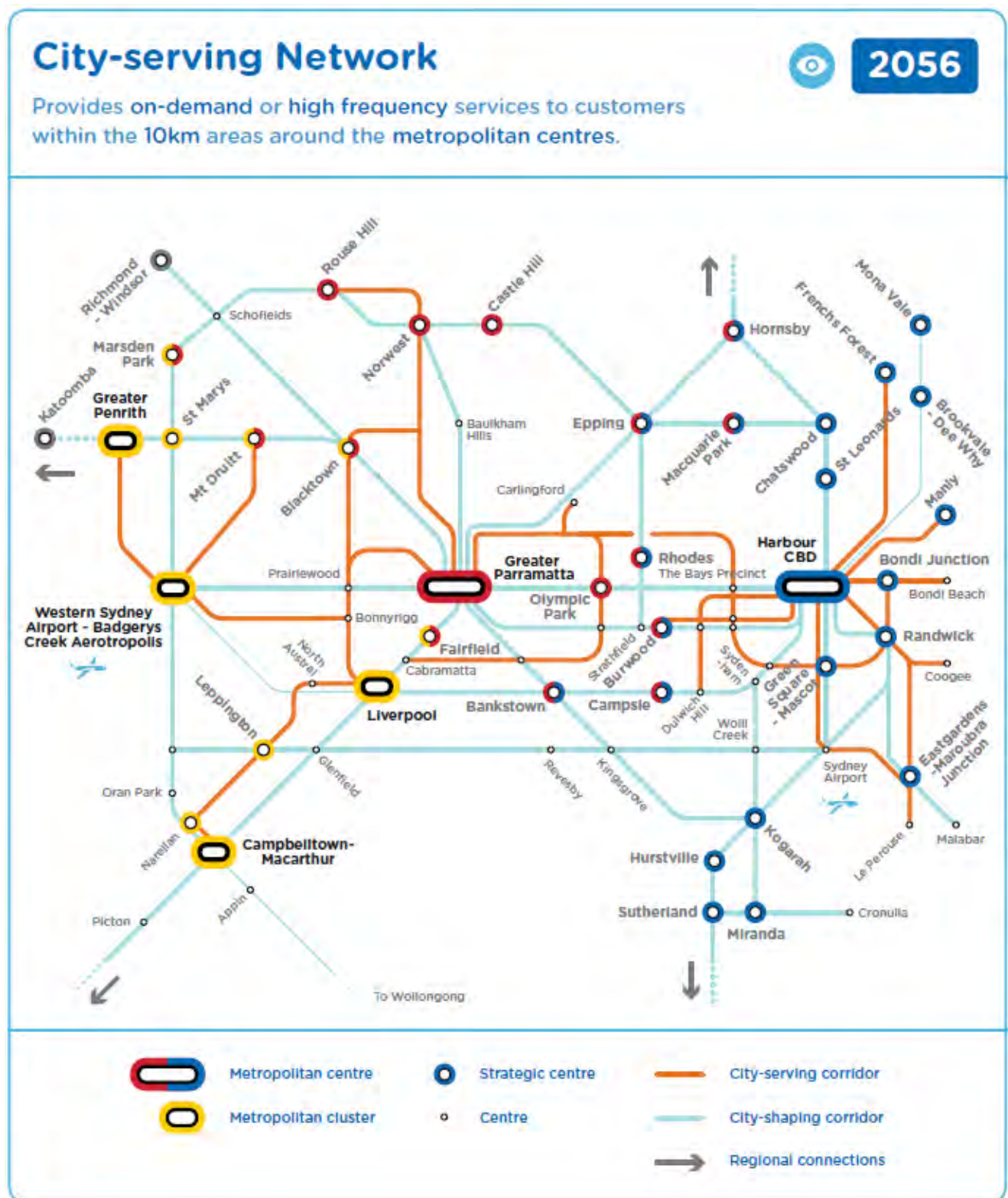


Figure 4-9 Greater Sydney city-serving transport network vision

Source: Greater Sydney Services and Infrastructure Plan (TfNSW, 2018)

General traffic and freight

The function of key roads in the proposal area would be impacted significantly by nearby land use changes and transport projects. As discussed in Section 4.3.1, the opening of the M8 Motorway, St Peters interchange, related surface road connections and related surface road upgrades are expected to alter traffic patterns in the proposal area, with Euston Road and Campbell Street / Campbell Road replacing Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo. In addition, the Alexandria to Moore Park Connectivity Upgrade is expected to increase traffic capacity along the Alexandria to Moore Park corridor to accommodate increased traffic volumes travelling to and from the M8 Motorway. Land use developments including the Ashmore Precinct are expected to increase the demand for travel for all customer groups. However, Sydney Metro City and Southwest is expected to facilitate significant mode shift away from general traffic to rail (and supporting bus services).

Euston Road is anticipated to have a significantly increased movement function for general traffic and freight as the road facilitates north-south connectivity between the St Peters interchange and the Alexandria to Moore Park corridor. Euston Road also provides connectivity for freight movements between industrial areas at St Peters, Alexandria and Beaconsfield and the wider motorway network. Campbell Street / Campbell Road are also expected to have a significantly increased movement function for general traffic and freight by providing access between the wider motorway and arterial road networks. The extension of Campbell Road over the Alexandra Canal provides an additional east-west connection between Alexandria and the St Peters interchange.

In contrast, Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) are expected to have a decreased movement function for general traffic and freight. These roads would primarily facilitate local access to residential areas in Newtown, Erskineville and St Peters, as well as access to the Newtown activity precinct. These roads would also carry less long-distance freight movements and service last-mile light freight movements to the Newtown activity precinct.

King Street is anticipated to retain its existing high movement function for general traffic, bus and active transport customers.

Traffic volumes and patterns

King Street (south of Lord Street) and Princes Highway (north of Campbell Street) is forecast to carry lower volumes of traffic in 2023 with a further decrease between 2023 and 2033. In 2033, during the weekday morning peak hour, the peak direction on these roads is expected to be northbound with volumes of up to 1770 vehicles per hour near the proposal. During the weekday evening peak hour, volumes are expected to be approximately 1000 vehicles per hour in each direction.

Sydney Park Road is also forecast to carry lower volumes of traffic in 2023 with a similar volumes in 2023 and 2033. In 2033, Sydney Park Road is forecast to carry between 380 and 1250 vehicles in each direction during the weekday morning peak hour with a distinct eastbound peak direction due to traffic travelling to and from industrial and employment areas located to the east. During the weekday evening peak hour, volumes are expected to be approximately 800 vehicles per hour in each direction.

King Street (north of the St Peters railway bridge) is forecast to carry approximately the same amount of traffic in 2023 with a decrease between 2023 and 2033. In 2033, King Street is expected to carry 370 to 750 vehicles in each direction during the weekday morning and evening peak hours. The peak direction is forecast to be northbound during the weekday morning and evening peak hours.

Mitchell Road is forecast to carry approximately the same amount of traffic in 2023 and 2033. In 2033, Mitchell Road is expected to carry between 270 and 820 vehicles in each direction with a northbound peak direction during the weekday morning and evening peak hours.

Campbell Street / Campbell Road is anticipated to carry a significantly higher amount of traffic in 2023 and 2033 due to motorway connections at St Peters interchange. In 2033, Campbell Street / Campbell Road is expected to carry between 910 to 1510 vehicles in each direction during the weekday morning and evening peak hours and exhibits an eastbound peak direction during the weekday morning peak hour.

As with Campbell Street / Campbell Road, Euston Road is anticipated to carry a significantly higher amount of traffic in 2023 and 2033 due to motorway connections at St Peters interchange. In 2033, Euston Road is expected to carry between 740 and 1890 vehicles in each direction during the weekday morning and evening peak hours and exhibits a northbound peak direction during the weekday morning peak hour and a southbound peak direction during the weekday evening peak hour.

Approximate peak hour midblock volumes on key roads are shown in Figure 4-10. The overall change in traffic volumes without the proposal between 2019, 2023 and 2033 is summarised in Table 4-2.

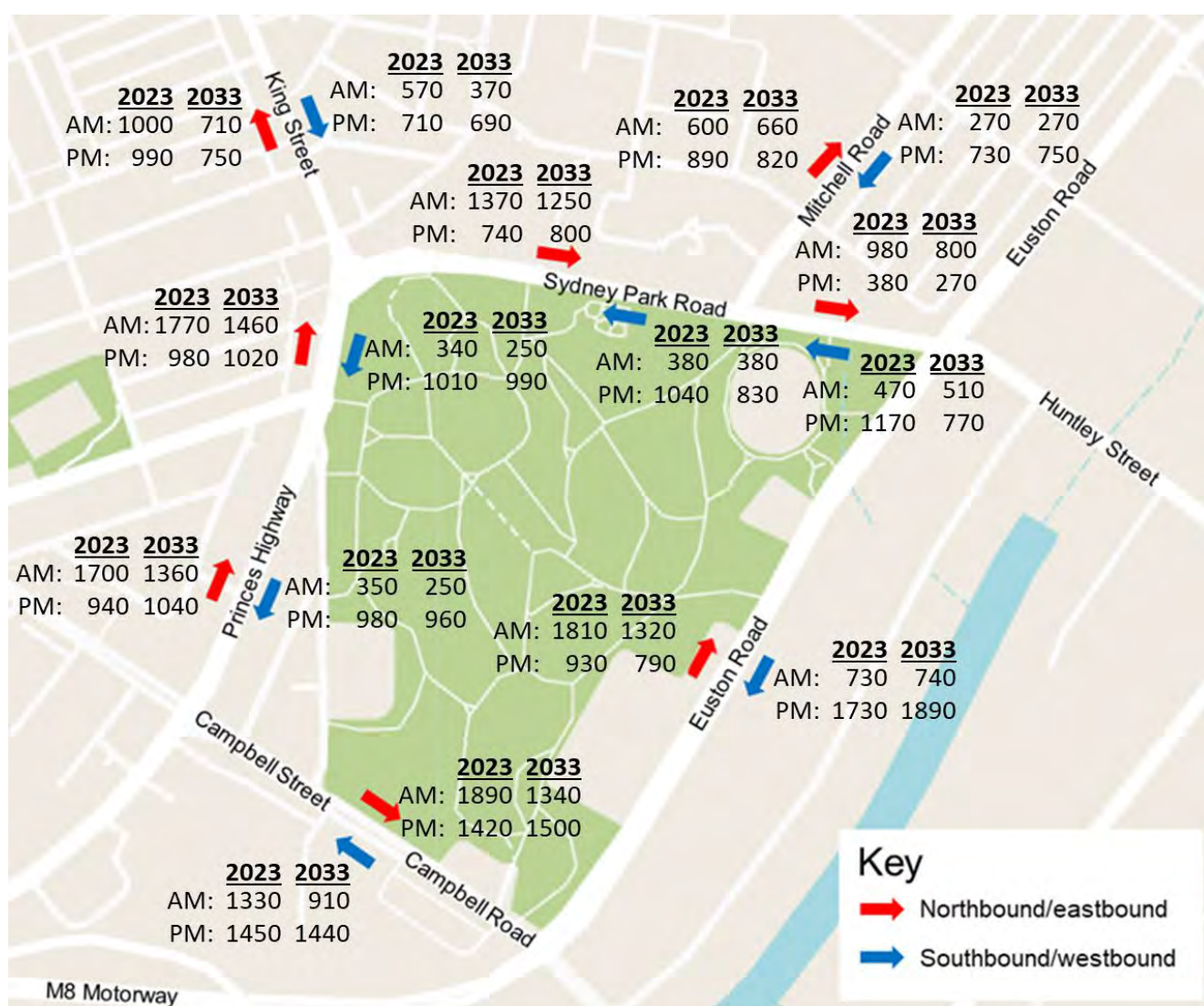


Figure 4-10 Peak hour traffic volumes by direction without proposal (2023 and 2033)

Table 4-2 Traffic volume changes without the proposal between 2019, 2023 and 2033

Road	Direction	2019 – 2023				2019 – 2033			
		AM peak change		PM peak change		AM peak change		PM peak change	
		Veh/hour	%	Veh/hour	%	Veh/hour	%	Veh/hour	%
King Street, north of Sydney Park Road	Northbound	290	41%	-10	-1%	5	1%	-245	-25%
	Southbound	-135	-19%	-140	-16%	-325	-47%	-165	-20%
Princes Highway, between Sydney Park Road and May Street	Northbound	-90	-5%	-320	-24%	-405	-22%	-280	-22%
	Southbound	-350	-50%	-1085	-52%	-440	-63%	-1105	-53%
Princes Highway, between May Street and Campbell Street	Northbound	190	12%	-150	-14%	-155	-10%	-55	-5%
	Southbound	-195	-36%	-570	-37%	-300	-55%	-580	-38%
Sydney Park Road, between Euston Road and Mitchell Road	Eastbound	-175	-15%	-210	-36%	-360	-31%	-325	-55%
	Westbound	-120	-20%	-470	-29%	-80	-14%	-875	-53%
Sydney Park Road, between Mitchell Road and King Street / Princes Highway	Eastbound	-360	-21%	-285	-28%	-485	-28%	-225	-22%
	Westbound	-200	-35%	-925	-47%	-195	-33%	-1135	-58%
Mitchell Road, north of Sydney Park Road	Northbound	-130	-18%	180	26%	-70	-9%	110	15%
	Southbound	30	13%	115	19%	35	15%	140	23%
Euston Road, between Huntley Street / Sydney Park Road and Campbell Road	Northbound	1805	-	935	-	1315	-	785	-
	Southbound	590	>100%	1635	>100%	600	>100%	1795	>100%
Campbell Street / Campbell Road, between Euston Road and Princes Highway	Eastbound	1340	>100%	1080	>100%	790	>100%	1160	>100%
	Westbound	925	>100%	775	>100%	500	>100%	775	>100%

Intersection performance

Modelled performance of key intersections in the modelling study area without the proposal during the weekday morning and evening peak hours in 2023 and 2033 is shown in Table 4-3.

Modelled intersection performance indicates that the following intersections would perform at LOS F:

- King Street / Sydney Park Road in 2033 during the weekday morning peak hour. This is due to high volumes of conflicting traffic from the northbound and westbound approaches
- Princes Highway / May Street in 2033 during the weekday morning peak hour. This is due to northbound congestion downstream at the King Street / Sydney Park Road intersection where there are high volumes of through traffic conflicting with right-turning and cross-street traffic
- Princes Highway / Campbell Street in 2023 during the weekday morning peak hour and in 2033 during the weekday morning and evening peak hours. This is due to high volumes of conflicting traffic, particularly from the northbound, eastbound and westbound approaches
- Euston Road / Huntley Street / Sydney Park Road in 2023 and 2033 during the weekday morning and evening peak hours. This is due to high volumes of conflicting traffic, particularly from the northbound, eastbound and westbound approaches

- Mitchell Road / Sydney Park Road in 2023 during the weekday morning peak hour and in 2033 during the weekday morning and evening peak hours. This is due to high volumes of east-west traffic on Sydney Park Road
- Euston Road / Campbell Road in 2033 during the weekday morning and evening peak hours. This is due to high volumes of conflicting traffic, particularly from the northbound, eastbound and westbound approaches.

Table 4-3 Modelled peak hour intersection performance without proposal (2023 and 2033)

Intersection and peak hour	2023 without proposal					2033 without proposal				
	Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)		Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)	
King Street / Sydney Park Road										
Morning	2720	36	C	NB	176	2220	103	F	NB	183
				EB	-				EB	-
				SB	57				SB	61
				WB	274				WB	189
Evening	2730	33	C	NB	98	2535	52	D	NB	182
				EB	-				EB	-
				SB	57				SB	60
				WB	148				WB	112
Princes Highway / May Street										
Morning	2285	28	B	NB	363	1845	174	F	NB	467
				EB	63				EB	129
				SB	44				SB	36
				WB	-				WB	-
Evening	2175	21	B	NB	117	2220	34	C	NB	438
				EB	44				EB	60
				SB	36				SB	37
				WB	-				WB	-
Princes Highway / Campbell Street										
Morning	5010	119	F	NB	489	3690	245	F	NB	493
				EB	359				EB	361
				SB	182				SB	116
				WB	312				WB	510
Evening	4675	45	D	NB	136	4650	75	F	NB	223
				EB	260				EB	363
				SB	106				SB	140
				WB	131				WB	184

Intersection and peak hour	2023 without proposal					2033 without proposal				
	Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)		Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)	
Euston Road / Huntley Street / Sydney Park Road										
Morning	3985	120	F	NB	510	3265	156	F	NB	472
				EB	261				EB	234
				SB	99				SB	101
				WB	265				WB	268
Evening	3955	88	F	NB	418	3600	119	F	NB	423
				EB	178				EB	260
				SB	161				SB	200
				WB	269				WB	269
Mitchell Road / Sydney Park Road										
Morning	2035	91	F	NB	< 5	1940	193	F	NB	< 5
				EB	486				EB	511
				SB	113				SB	105
				WB	259				WB	279
Evening	2600	57	E	NB	< 5	2240	138	F	NB	< 5
				EB	232				EB	508
				SB	149				SB	151
				WB	271				WB	279
Euston Road / Campbell Road / M8 Motorway ramps										
Morning	4490	60	E	NB	231	3695	190	F	NB	510
				EB	457				EB	126
				SB	70				SB	143
				WB	153				WB	383
Evening	4290	42	C	NB	102	4795	169	F	NB	510
				EB	93				EB	501
				SB	129				SB	169
				WB	103				WB	390

5. Assessment of potential impacts

5.1 Construction

5.1.1 Key assumptions

Construction hours

Construction of the proposal would be undertaken during the following hours:

- Daytime activities: 7 am to 6 pm Monday to Friday, and 8 am to 1 pm on Saturday
- Nighttime activities: 8 pm to 5 am, subject to the granting of road occupancy licences by TfNSW's Transport Management Centre.

Construction zones and staging

Construction of the proposal would be undertaken in two main zones:

- Zone A: Princes Highway / King Street – Sydney Park Road to Campbell Street
- Zone B: Sydney Park Road – Euston Road to King Street.

Construction of the proposal has been staged to allow the existing road corridor to remain open to traffic, cyclist and pedestrian movements during construction. Construction of the proposal would be undertaken in three stages:

- Stage 0: Preparation works for future stages including the removal of median slabs, installation of temporary pavement and drainage adjustments. Major components including installation of drainage would also be constructed in Stage 0 in some areas
- Stages 1 and 2: Permanent works would include installation of drainage, construction of kerbs and pavements and landscape works.

Traffic arrangements on Princes Highway and Sydney Park Road would be altered to facilitate construction works and are described in Table 5-1. A 40 kilometres per hour roadwork speed limit would be introduced on the approaches to and through the construction zones.

Table 5-1 Traffic arrangements during construction

Stage	Time of day	Zone	Traffic arrangements
0	Night	Zones A and B	Traffic conditions in accordance with road occupancy licence requirements. No daytime changes to traffic are proposed.
1	Day	Zone A	<ul style="list-style-type: none"> ▪ Two northbound lanes and two southbound lanes would be in operation on Princes Highway / King Street between Sydney Park Road and Barwon Park Road ▪ The northbound approach to the King Street / Sydney Park Road intersection would have one through lane and one shared through and right turn lane. The northbound departure from the intersection would have two through lanes. The southbound approach to the intersection would have one through lane and one shared through and left turn lane. The southbound departure from the intersection would have two through lanes ▪ Two northbound lanes and one southbound lane would be in operation on Princes Highway between Barwon Park Road and Campbell Street.
		Zone B	One eastbound lane and one westbound lane would be in operation on Sydney Park Road between Euston Road and King Street.

Stage	Time of day	Zone	Traffic arrangements
2	Day	Zone A	Two northbound lanes and two southbound lanes would be in operation on Princes Highway / King Street between Sydney Park Road and Campbell Street.
		Zone B	One eastbound lane and one westbound lane would be in operation on Sydney Park Road between Euston Road and King Street.

Construction program

Construction of the proposal is anticipated to commence in mid-2021 for a duration of 24 months.

Construction compound locations and access

Site compounds and ancillary facilities will be located at Burrows Road and Venice Street, Mascot on TfNSW-owned land. Additional compound and stockpile sites may be required for equipment laydown, stockpiling and staff parking. The location of these sites would be confirmed prior to construction and the final number of vehicles accessing the ancillary facility would be determined by the construction contractor.

Construction vehicles would generally access the construction sites via the M8 Motorway, Euston Road and Campbell Street / Campbell Road as shown in Figure 5-1. It is anticipated that construction traffic movements in each of the two construction zones would adopt a “left-in, left-out” access arrangement.



Figure 5-1 Construction vehicle routes

Construction vehicles and parking

The average daily number of vehicles required to construct the proposal, including personnel and transport of materials and equipment, would be approximately 30 light vehicles and 10 heavy vehicles, which equates to 60 light vehicle movements and 20 heavy vehicle movements (one vehicle = two movements). The peak number of vehicles would be approximately 60 light vehicles and 20 heavy vehicles, which equates to 120 light vehicle movements and 40 heavy vehicle movements. The final number of vehicles would be determined by the construction contractor.

Construction car parking would be provided at the ancillary facility sites. It is not expected that surplus parking demand from construction activities would reduce the availability of surrounding public parking.

5.1.2 Impacts on active transport customers

Pedestrians and cyclists may be diverted slightly around construction works in Zone A and Zone B. However, impacts to pedestrian and cyclists are expected to be minor as access will be maintained and footpaths and shared user paths on Sydney Park Road would remain operational during construction of the proposal.

5.1.3 Impacts on public transport customers

Princes Highway and Sydney Park Road are currently used by buses and form part of the proposed construction vehicle routes. Existing bus stops would remain operational during construction of the proposal. Bus operators, TfNSW, the City of Sydney and Inner West Council (as relevant) would be consulted, and the community would be informed of, any temporary changes to bus stop operation. Minimal impacts to buses are expected and would be limited to a potential minor increase in travel time due to additional construction vehicles on the road network and reduction in the number of lanes available to traffic.

Pedestrian accessibility to St Peters train station would not be impacted during construction of the proposal.

5.1.4 Impacts on general traffic and freight customers

The reduction in the number of lanes available to traffic during construction of the proposal would potentially increase travel times on the road network. To minimise potential impacts to travel times, construction has been staged to minimise operational and road alignment changes. Construction of the proposal would be accompanied by traffic management measures including a variable message sign strategy to encourage through and regional traffic to use Euston Road and Campbell Street / Campbell Road instead of Princes Highway and Sydney Park Road.

The impact of construction vehicle movements on the road network would be minor given the number of construction vehicle movements is relatively low and is within the range of daily variations in traffic volumes on the road network when compared to background traffic.

5.1.5 Impacts on property and emergency vehicle access

Access to properties and businesses along the proposal would be minor as access would be maintained during construction. Temporary property access would be provided to residences and businesses where required. The management of property access would be considered by the construction contractor and detailed as part of the final staging plan for the proposal.

Access for emergency services would be maintained with the contractor who would be required to carry out the necessary consultation with the emergency services before any changed traffic conditions are implemented.

5.1.6 Cumulative construction impacts

Cumulative construction impacts of other nearby developments or activities that are underway or likely to commence during the proposal's construction timeframe have been summarised qualitatively in Table 5-2. Cumulative construction impacts are expected to be limited to additional construction vehicles on the road network near the proposal, which would potentially increase travel times on the road network as well as minor impacts to pedestrians and cyclists on Campbell Road and Campbell Street.

Table 5-2 Cumulative construction impacts

Project description	Cumulative construction impacts
<p>WestConnex M4-M5 Link</p> <p>The M4-M5 Link Tunnels are currently being constructed as part of M4-M5 Link project of WestConnex and will connect the New M4 at Haberfield with the M8 Motorway at St Peters.</p> <p>The M4-M5 Link Tunnels team started tunnelling from the Campbell Road civil and tunnel site in May 2019 and work will continue in the St Peters area heading towards Newtown during 2020. Construction of the project is expected to be completed by 2023.</p>	<p>There is potential for the construction works period to overlap with that of the proposal and as such cumulative construction impacts would be possible.</p> <p>Temporary cumulative construction impacts would include increased construction traffic on Princes Highway and Campbell Road near the Campbell Road civil and tunnel site.</p>
<p>Sydney Gateway</p> <p>Transport for NSW and Sydney Airport Corporation Limited propose to build new direct high capacity road connections linking the Sydney motorway network at the St Peters interchange with Sydney Airport's domestic and international terminals and beyond.</p> <p>It is anticipated that construction would start in late 2020 and take about 3.5 years to complete.</p>	<p>The proposed development is located approximately 570 metres south of the proposal. The construction period could potentially overlap with that of the proposal and as such cumulative construction impacts would be possible.</p> <p>Temporary cumulative construction impacts would include increased construction traffic on Princes Highway and near construction sites to the south of the proposal.</p>
<p>Alexandria to Moore Park</p> <p>Transport for NSW proposes to upgrade major intersections located along the Euston Road, McEvoy Street, Lachlan Street and Dacey Avenue corridor. Stage 1 of the Alexandria to Moore Park project involves the upgrade of four intersections and the introduction of clearways between the Euston Road/Maddox Street intersection in Alexandria and the Anzac Parade/Alison Road/Dacey Avenue intersection in Moore Park.</p> <p>Construction of Stage 1 is expected to commence in mid-2020 and would take around 36 months to complete.</p>	<p>The proposed development is located approximately 260 metres north-east of the proposal.</p> <p>There is potential for the construction works period for Stage 1 to overlap with that of the proposal and as such cumulative construction impacts would be possible.</p> <p>Temporary cumulative construction impacts would include increased construction traffic on the road network near the proposal, particularly near construction zones to the north-east of the proposal.</p>
<p>Visy Dry Recyclables Facility</p> <p>The State Significant Development application for the construction and operation of a waste transfer and materials recovery facility at 112-120 Euston Road, Alexandria was approved in April 2020.</p> <p>Stage 1 construction will take about three months to complete and was scheduled to commence in the first half of 2020. Stage 2 construction is anticipated to take about four months. A commencement time for the Stage 2 construction is not yet determined.</p>	<p>The commencement time for Stage 2 construction is not yet determined. There is potential for the construction works period for Stage 2 to overlap with that of the proposal and as such cumulative construction impacts would be possible.</p> <p>Temporary cumulative construction impacts would include increased construction traffic on the road network near the proposal, including on Euston Road.</p>
<p>Ashmore Precinct</p> <p>The Ashmore Precinct is located in Erskineville and next to Alexandria, bounded by Ashmore Street, Mitchell Road, Coulson Street and the Illawarra Railway line and would redevelop an industrial site into a sustainable neighbourhood consisting of about 3,785 homes, a commercial/retail centre, a central park (McPherson Park) and bike links. The development is likely to be completed by 2025.</p>	<p>There is potential for some of the construction works to overlap with that of the proposal and as such cumulative construction impacts would be possible.</p> <p>Temporary cumulative construction impacts would include increased construction traffic on the road network near the proposal, particularly near development sites to the north of the proposal.</p>

Project description	Cumulative construction impacts
<p>St Peters Station Upgrade</p> <p>Planning is currently underway to upgrade St Peters Station as part of the Transport for NSW's Transport Access Program.</p> <p>The project is expected to be completed in 2023. No further details are currently available regarding expected construction dates.</p>	<p>The proposed upgrade of St Peters Station would be carried out immediately adjacent to the proposal. There is potential for the construction works period to overlap with that of the proposal and as such cumulative construction impacts would be possible.</p> <p>Temporary cumulative construction impacts would include increased construction traffic on the road network near the proposal.</p>

5.2 Operation

5.2.1 Road safety

The proposal would include an increased number of formal crossing opportunities, footpath widening, landscaping and segregated cycleways which would improve safety outcomes for pedestrians and cyclists. As discussed in Section 1.1, additional formal crossing opportunities are proposed at the following locations:

- Signalised pedestrian crossing on Princes Highway at Short Street
- Signalised shared crossing on King Street between May Street and Goodsell Street
- Signalised pedestrian crossing on Princes Highway at Barwon Park Road
- Unsignalised pedestrian crossing on Sydney Park Road at the Sydney Park Cycle Centre.

The above crossings would improve safety by reducing the distance between formal crossing opportunities and reducing the number of pedestrians and cyclists crossing King Street, Princes Highway and Sydney Park Road at unsafe locations. Furthermore, additional signalised pedestrian crossings are proposed across the western leg of the Mitchell Road / Sydney Park Road intersection and on the northern leg of the King Street / Sydney Park Road intersection (replacing the unsignalised pedestrian crossing across the southbound left-turn slip lane), which would also improve safety for pedestrians and cyclists.

Footpath widening and landscaping is proposed along the following sections:

- Western side of Princes Highway / King Street between Sydney Park Road and Barwon Park Road
- Western and eastern side of Princes Highway south of Barwon Park Road
- Both sides of Sydney Park Road.

Widened footpaths and landscaping would increase separation between pedestrians and traffic and discourage pedestrians from crossing at unsafe locations. Similarly, a two-way on-road segregated cycleway is proposed on the northern side of Sydney Park Road as well as on the western side of King Street between May Street and St Peters square that would separate cyclists from traffic and discourage cyclists from crossing at unsafe locations.

The proposal would reduce traffic volumes and speed limits on King Street, Princes Highway and Sydney Park Road (refer to Section 5.2.5). This would lead to a reduction in the likelihood of crashes on these roads. The proposal would also reduce the volume of heavy vehicles on these roads, which would potentially reduce the severity of crashes. Reduced likelihood and severity of crashes would lead to a reduction in FSI and casualty crash rates.

5.2.2 Impact to function and significance of key roads

The function of some roads would be impacted by the proposal. In combination with the opening of the full WestConnex scheme, related surface road connections and upgrades, and the Alexandria to Moore Park Connectivity Upgrade, the proposal would result in Euston Road and Campbell Street / Campbell Road replacing Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo.

Euston Road would have an increased movement function for general traffic and freight as the road facilitates north-south connectivity between the St Peters interchange and the Alexandria to Moore Park corridor. Euston Road also provides connectivity for freight movements between industrial areas at St Peters, Alexandria and Beaconsfield and the wider motorway network. Campbell Street / Campbell Road would also have an increased movement function for general traffic and freight by providing access between the wider motorway and arterial road networks. The extension of Campbell Road over the Alexandra Canal provides an additional east-west connection between Alexandria and the St Peters interchange.

In contrast, Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) would have a decreased movement function for general traffic and freight customers and increased movement function for active transport customers. These roads would primarily facilitate local access to residential areas in Newtown, Erskineville and St Peters, as well as access for pedestrians and cyclists to Sydney Park, St Peters train station and the Newtown activity precinct. These roads would also carry less long-distance freight movements and service last-mile light freight movements to the Newtown activity precinct.

King Street (north of Lord Street) would retain its existing high movement function for general traffic, bus and active transport customers.

5.2.3 Impacts on active transport customers

Pedestrians

The increased number of formal crossing opportunities, footpath widening and landscaping as part of the proposal would significantly improve pedestrian movement. The additional formal crossing opportunities at the locations described in Section 1.1 would significantly improve connectivity by reducing the distance between formal crossing opportunities to a maximum of approximately 200 metres on Princes Highway (between Short Street and Barwon Park Road) and approximately 280 metres on Sydney Park Road (between Euston Road and Mitchell Road). Furthermore, these additional formal crossing opportunities would allow direct connectivity and shorten overall walking distances to destinations such as Sydney Park, St Peters train station, bus stops on Princes Highway and Sydney Park Road, and retail and commercial land uses on Princes Highway near Short Street. Pedestrian crossings on Princes Highway at Barwon Park Road and between Goodsell Street and May Street would counter connectivity impacts resulting from the removal of traffic signals at the Princes Highway / May Street intersection.

Footpath widening along Princes Highway and Sydney Park Road would improve walking accessibility and reduce the impacts of pedestrian crowding and dwelling on pedestrian movement. Furthermore, landscaping, bollards, dynamic community spaces and parklets would improve walking comfort by increasing separation between pedestrians and traffic. This is particularly significant for Princes Highway as the existing footpath has limited separation with the road, which carries high adjacent vehicle flows with a 60 kilometres per hour speed limit.

The reduction in traffic lanes and traffic volumes, footpath widening and landscaping would also improve place for pedestrians. Pedestrian dwelling opportunities are expected to improve due to a reduction in traffic lanes on Princes Highway and Sydney Park Road, which would reduce adjacent vehicle flows and improve the pedestrian environment. This would be further improved by footpath widening and landscaping, which would increase the amount of dwelling space for pedestrians and improve safety by increasing separation between pedestrians and traffic.

Cyclists

As with pedestrians, the cyclist movement on Princes Highway and Sydney Park Road would improve significantly as a result of the increased number of formal crossing opportunities and dedicated cycle paths. The additional formal crossing opportunities at the locations described in Section 1.1 would improve cycling connectivity across Princes Highway and Sydney Park Road, including the Sydney Park Cycle Centre on Sydney Park Road. Furthermore, a permanent two-way on-road segregated cycleway on the northern side of Sydney Park Road would improve cycling facilities by replacing the existing temporary pop-up cycleway and provide connectivity to cycling facilities on Huntley Street and the wider regional cycle network. In addition, a new on-road cycleway on the western side of King Street between May Street and St Peters square would also improve the cycling environment and safety on Sydney Park Road by removing conflicts with pedestrians and further delineating cyclists from traffic.

5.2.4 Impacts on public transport customers

Minimal impacts to buses are expected and would be limited to a potential minor increase in travel time due to the reduction in the number of lanes available to traffic on Sydney Park Road and Princes Highway. It is considered that any potential increase in bus travel times is relatively minor when considered in the context of overall door-to-door travel times, where typical journeys are multi-modal (e.g. walking and bus; or walking, bus and train).

Bus place performance is not expected to change as the proposal does not include changes to bus stop facilities. However, safety and connectivity for bus customers accessing the relocated northbound and southbound bus stops at Princes Highway at/opposite Short Street (ID 204436 and 204437) will be improved due to the new signalised pedestrian crossing on Princes Highway at Short Street.

Accessibility to St Peters train station would be improved with the proposal in operation with improved pedestrian and cyclist connectivity as described in Section 5.2.3.

5.2.5 Impacts on general traffic and freight customers

Parking

Impacts to parking are summarised in Table 5-3. The proposal would increase on-street parking provision on King Street between May Street and Goodsell Street. The proposal would also increase on-street parking provision on Sydney Park Road and would also improve accessibility to the Sydney Park car park with the allowance of right-turn movements from Sydney Park Road in the eastbound direction.

The proposal would reduce on-street kerbside parking (outside of clearway restrictions) on the western side of Princes Highway primarily near Barwon Park Road due to the upgrade of the Barwon Park Road / Princes Highway intersection. The proposal would also reduce on-street kerbside parking (outside of clearway restrictions) on the eastern side of Princes Highway primarily near Short Street due to the upgrade of the Short Street / Princes Highway intersection and the relocation of the bus stops in this location.

The proposal would also include the provision of an additional four on-street kerbside parking spaces on May Street and an additional three off-street parking spaces at the Sydney Park brickworks site. One on-street kerbside parking space would be removed on Goodsell Street to allow for kerb modifications.

Table 5-3 Existing parking and parking with the proposal

Road	No. of car park spaces without the proposal (total length of parking provision)	No. of car park spaces with the proposal (total length of parking provision)
Sydney Park Road	38 (252m)	30 (189m)
May Street	4 (27m)	13 (82m)
King Street between May Street and Goodsell Street	6 (40m)	0
Princes Highway between Campbell Street and May Street (western side)	38 (241m)	31 (197m)
Princes Highway between Campbell Street and May Street (eastern side)	33 (210m)	30 (192m)
Total	119 (770m)	104 (660m)

Traffic volumes and patterns

King Street (south of Lord Street) and Princes Highway (north of Campbell Street) would carry up to 55 per cent fewer vehicles in 2023 and up to 66 per cent fewer vehicles in 2033 with the proposal when compared to the scenario without the proposal. In 2033 with the proposal, during the weekday morning peak hour, the peak direction on these roads would be northbound with volumes of up to 940 vehicles per hour in each direction. During the weekday evening peak hour, volumes would be approximately 720 vehicles per hour in each direction.

Sydney Park Road would carry up to 71 per cent fewer vehicles in 2023 and up to 65 per cent fewer vehicles in 2033 with the proposal when compared to the scenario without the proposal. In 2033 with the proposal, Sydney Park Road would carry between 250 and 670 vehicles in each direction during the weekday morning and evening peak hours.

King Street (north of the St Peters railway bridge) would carry up to 47 per cent fewer vehicles in 2023 and up to 46 per cent fewer vehicles in 2033 with the proposal when compared to the scenario without the proposal. In 2033 with the proposal, King Street would carry 200 to 770 vehicles in each direction during the weekday morning and evening peak hours. The peak direction would be northbound during the weekday morning peak hour.

Mitchell Road would carry up to 57 per cent fewer vehicles in 2023 and up to 54 per cent fewer vehicles in 2033 with the proposal when compared to the scenario without the proposal. In 2033, Mitchell Road would carry between 160 and 570 vehicles in each direction with a northbound peak direction during the weekday morning and evening peak hours.

Campbell Street / Campbell Road would carry up to 11 per cent less vehicles in 2023 and up to 26 per cent more vehicles in 2033 with the proposal when compared to the scenario without the proposal. In 2033, Campbell Street / Campbell Road would carry between 1150 and 1680 vehicles in each direction during the weekday morning and evening peak hours and would exhibit an eastbound peak direction during the weekday morning peak hour and a westbound peak direction during the weekday evening peak hour.

Euston Road would carry up to 15 per cent more vehicles in 2023 and up to 16 per cent more vehicles in 2033 with the proposal when compared to the scenario without the proposal. In 2033, Euston Road would carry between 830 and 2040 vehicles in each direction during the weekday morning and evening peak hours and would exhibit a northbound peak direction during the weekday morning peak hour and a southbound peak direction during the weekday evening peak hour.

Overall, traffic volume changes confirm the proposal would reinforce the replacement of Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) with Euston Road and Campbell Street / Campbell Road as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo. The reductions in traffic volumes on Sydney Park Road, King Street (south of Lord Street), Princes Highway (north of Campbell Street) and Mitchell Road also confirm these roads would serve mostly local traffic with origins or destinations in Newtown, Erskineville or Alexandria. Furthermore, the altered traffic patterns and volumes do not account for the change in traffic flow which is likely to take place with the opening of the WestConnex M4-M5 Link in late 2023. Therefore, it is considered that the traffic volumes present a worst-case scenario.

Approximate peak hour midblock volumes on key roads with and without the proposal are shown in

Figure 5-2 (2023) and Figure 5-3 (2023). The overall change in traffic volumes with the proposal between 2019, 2023 and 2033 is summarised in Table 5-4.

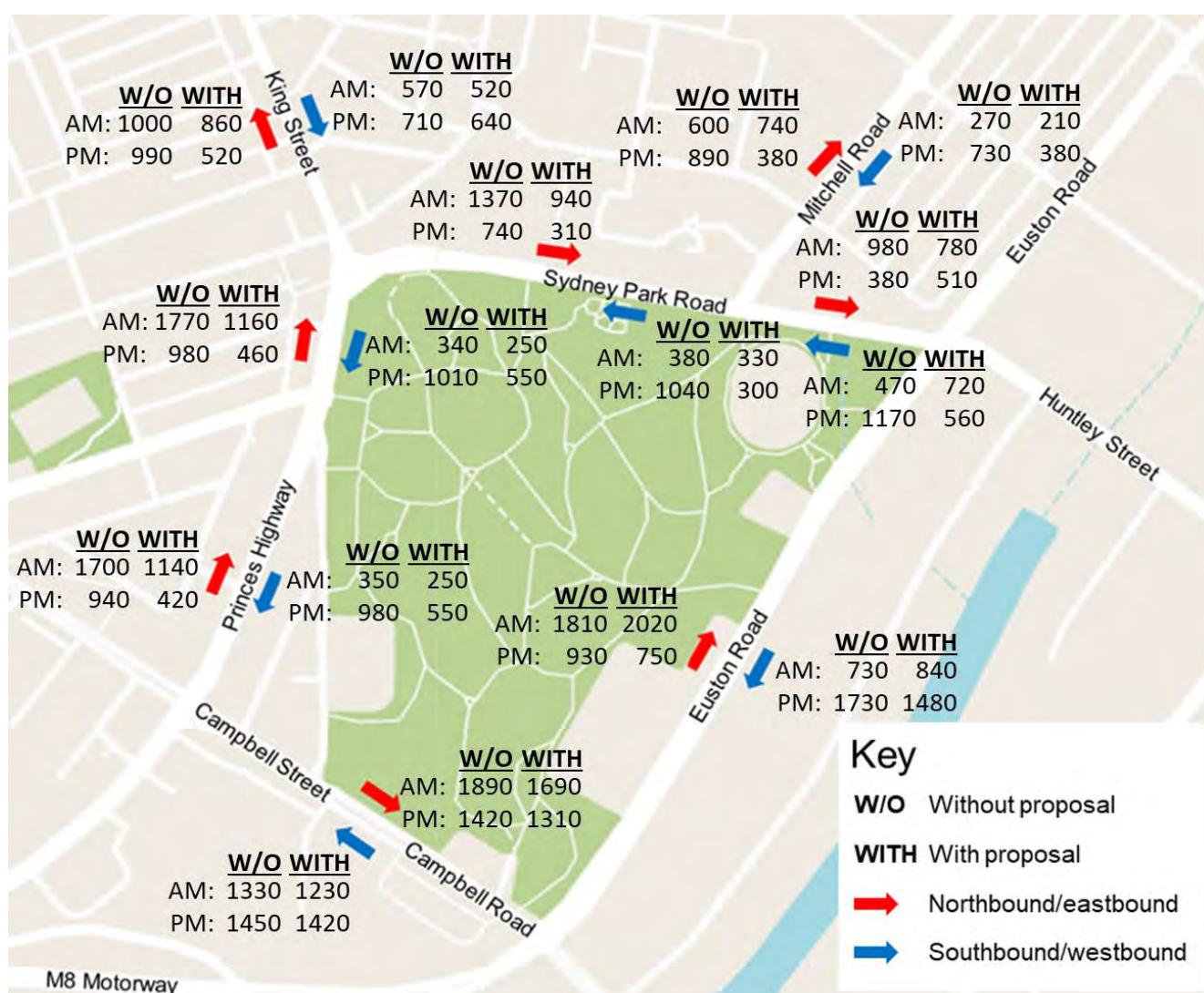


Figure 5-2 Peak hour traffic volumes by direction with and without the proposal (2023)



Figure 5-3 Peak hour traffic volumes by direction with and without the proposal (2033)

Table 5-4 Traffic volume changes with the proposal between 2019, 2023 and 2033

Road	Direction	2019 – 2023				2019 – 2033			
		AM peak change		PM peak change		AM peak change		PM peak change	
		Veh/hour	%	Veh/hour	%	Veh/hour	%	Veh/hour	%
King Street, north of Sydney Park Road	Northbound	150	21%	-475	-48%	60	8%	-400	-40%
	Southbound	-185	-26%	-210	-25%	-500	-71%	-265	-31%
Princes Highway, between Sydney Park Road and May Street	Northbound	-700	-38%	-835	-64%	-1335	-72%	-955	-73%
	Southbound	-450	-65%	-1545	-74%	-600	-87%	-1625	-78%
Princes Highway, between May Street and Campbell Street	Northbound	-370	-25%	-670	-61%	-580	-38%	-370	-34%
	Southbound	-295	-54%	-990	-64%	-455	-83%	-1070	-69%
Sydney Park Road, between Euston Road and Mitchell Road	Eastbound	-375	-32%	-80	-13%	-765	-66%	80	13%
	Westbound	140	23%	-1085	-66%	-110	-18%	-1100	-67%
Sydney Park Road, between Mitchell Road and King Street / Princes Highway	Eastbound	-795	-46%	-715	-70%	-1070	-62%	-435	-42%
	Westbound	-255	-44%	-1660	-85%	-325	-56%	-1675	-85%
Mitchell Road, north of Sydney Park Road	Northbound	10	2%	-330	-46%	-160	-22%	-220	-31%
	Southbound	-30	-13%	-230	-37%	-80	-33%	-265	-43%
Euston Road, between Huntley Street / Sydney Park Road and Campbell Road	Northbound	2020	-	745	-	1525	-	850	-
	Southbound	700	>100%	1380	>100%	685	>100%	1945	>100%
Campbell Street / Campbell Road, between Euston Road and Princes Highway	Eastbound	1140	>100%	965	>100%	1135	>100%	1150	>100%
	Westbound	825	>100%	750	>100%	735	>100%	975	>100%

Intersection performance

Modelled performance of key intersections in the modelling study area with and without the proposal during the weekday morning and evening peak hours is shown in Table 5-5 (2023) and Table 5-6 (2033).

Modelled intersection performance indicates that the following intersections would perform at a worse Level of Service when compared to the scenario without the proposal:

- King Street / Sydney Park Road in 2023 during the weekday morning and evening peak hours. This is due to high volumes of conflicting traffic from the northbound and westbound approaches
- Princes Highway / May Street in 2023 during the weekday morning and evening peak hours. This is due to northbound congestion downstream at the King Street / Sydney Park Road intersection where there are high volumes of through traffic conflicting with right-turning and cross-street traffic
- Princes Highway / Campbell Street in 2023 during the weekday evening peak hour. This is due to high volumes of conflicting traffic, particularly from the northbound, eastbound and westbound approaches
- Mitchell Road / Sydney Park Road in 2023 during the weekday evening peak hour. This is due to high volumes of east-west traffic on Sydney Park Road
- Euston Road / Campbell Road in 2023 during the weekday evening peak hour. This is due to high volumes of conflicting traffic, particularly from the northbound, southbound and westbound approaches.

All intersections would perform at the same Level of Service in 2033 when compared to the scenario without the proposal. The average delay varies between being greater without the proposal and greater with the proposal though generally it is similar across intersections.

Table 5-5 Modelled peak hour intersection performance with and without the proposal (2023)

Intersection and peak hour	2023 without proposal					2023 with proposal				
	Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)		Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)	
King Street / Sydney Park Road										
Morning	2720	36	C	NB	176	2045	80	F	NB	166
				EB	-				EB	-
				SB	57				SB	61
				WB	274				WB	499
Evening	2730	33	C	NB	98	1380	97	F	NB	166
				EB	-				EB	-
				SB	57				SB	59
				WB	148				WB	142
Princes Highway / May Street										
Morning	2285	28	B	NB	363	1540	149	F	NB	488
				EB	63				EB	344
				SB	44				SB	34
				WB	-				WB	-
Evening	2175	21	B	NB	117	1100	110	F	NB	480
				EB	44				EB	303
				SB	36				SB	31
				WB	-				WB	-
Princes Highway / Campbell Street										
Morning	5010	119	F	NB	489	4175	196	F	NB	493
				EB	359				EB	361
				SB	182				SB	85
				WB	312				WB	481
Evening	4675	45	D	NB	136	3550	119	F	NB	480
				EB	260				EB	354
				SB	106				SB	142
				WB	131				WB	306

Intersection and peak hour	2023 without proposal					2023 with proposal				
	Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)		Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)	
Euston Road / Huntley Street / Sydney Park Road										
Morning	3985	120	F	NB	510	4000	88	F	NB	444
				EB	261				EB	239
				SB	99				SB	110
				WB	265				WB	97
Evening	3955	88	F	NB	418	2875	146	F	NB	509
				EB	178				EB	246
				SB	161				SB	222
				WB	269				WB	269
Mitchell Road / Sydney Park Road										
Morning	2035	91	F	NB	< 5	1865	85	F	NB	< 5
				EB	486				EB	509
				SB	113				SB	77
				WB	259				WB	271
Evening	2600	57	E	NB	< 5	1190	205	F	NB	< 5
				EB	232				EB	512
				SB	149				SB	158
				WB	271				WB	251
Euston Road / Campbell Road / M8 Motorway ramps										
Morning	4490	60	E	NB	231	4445	57	E	NB	249
				EB	457				EB	131
				SB	70				SB	71
				WB	153				WB	127
Evening	4290	42	C	NB	102	3850	85	F	NB	332
				EB	93				EB	79
				SB	129				SB	112
				WB	103				WB	134

Table 5-6 Modelled peak hour intersection performance with and without the proposal (2033)

Intersection and peak hour	2033 without proposal					2033 with proposal				
	Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)		Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)	
King Street / Sydney Park Road										
Morning	2220	103	F	NB	183	1525	96	F	NB	168
				EB	-				EB	-
				SB	61				SB	58
				WB	189				WB	182
Evening	2535	52	D	NB	182	1660	46	D	NB	159
				EB	-				EB	-
				SB	60				SB	58
				WB	112				WB	104
Princes Highway / May Street										
Morning	1845	174	F	NB	467	1255	226	F	NB	475
				EB	129				EB	343
				SB	36				SB	44
				WB	-				WB	-
Evening	2220	34	C	NB	438	1380	37	C	NB	394
				EB	60				EB	38
				SB	37				SB	31
				WB	-				WB	-
Princes Highway / Campbell Street										
Morning	3690	245	F	NB	493	3670	213	F	NB	493
				EB	101				EB	166
				SB	116				SB	43
				WB	510				WB	338
Evening	4650	75	F	NB	223	4090	168	F	NB	481
				EB	363				EB	364
				SB	140				SB	138
				WB	184				WB	243
Euston Road / Huntley Street / Sydney Park Road										
Morning	3265	156	F	NB	472	3165	177	F	NB	510
				EB	234				EB	260
				SB	101				SB	166
				WB	268				WB	122

Intersection and peak hour	2033 without proposal					2033 with proposal				
	Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)		Intersection throughput (veh / hr)	Average delay (sec / veh)	Level of Service	Maximum queue length by directional approach (m)	
Evening	3600	119	F	NB	423	3625	106	F	NB	181
				EB	260				EB	184
				SB	200				SB	242
				WB	269				WB	269
Mitchell Road / Sydney Park Road										
Morning	1940	193	F	NB	< 5	1295	140	F	NB	0
				EB	511				EB	505
				SB	105				SB	128
				WB	279				WB	292
Evening	2240	138	F	NB	< 5	1450	114	F	NB	14
				EB	508				EB	418
				SB	151				SB	161
				WB	279				WB	252
Euston Road / Campbell Road / M8 Motorway ramps										
Morning	3695	190	F	NB	510	4050	156	F	NB	510
				EB	126				EB	509
				SB	143				SB	81
				WB	383				WB	153
Evening	4795	169	F	NB	510	4805	142	F	NB	344
				EB	501				EB	313
				SB	169				SB	273
				WB	390				WB	390

The decrease in intersection performance with the proposal in operation, as shown by decreases in Levels of Service and increases in average delays, is to be expected when lane capacity is removed from an already congested network. The following are potential impacts of removing lane capacity from traffic networks that are already operating at or close to capacity (which is effectively the same as additional vehicles being introduced to the network):

- Increased queuing and congestion
- Retiming of vehicle trips to either side of the peak to avoid congestion, resulting in 'peak spreading'
- Rerouting of vehicle trips to other roads to avoid congestion
- Use of other modes such as active transport or public transport
- Other behavioural changes such as changing origin / destination or not undertaking the trip at all.

In reality, a combination of all of the impacts would occur. Traffic modelling assumes that only increased queuing and congestion would occur and does not account for the other potential impacts listed above. Furthermore, the process for calculating demand for 2023 (linear interpolation between 2021 and 2031) does not account for the step-change in traffic flow which is likely to take place with the opening of nearby transport infrastructure projects, including WestConnex M4-M5 Link and Sydney Gateway, which are expected to open in 2022 and 2023 respectively. Therefore, it is considered that the traffic modelling presents a worst-case scenario.

It is considered the impacts of the decrease in intersection performance on general traffic and freight customers are relatively minor and manageable when considered in the context of the positive impacts of the proposal on the movement and place performance for active transport customers as described in Section 5.2.3.

Notwithstanding this, management measures have been proposed which would address the impacts of the decrease in intersection performance on general traffic and freight customers. These are described in Section 6.

5.2.6 Impacts on movement and place

As per the *Practitioner's Guide to Movement and Place*, the proposal is anticipated to significantly improve the overall movement and place performance of the surrounding built environment as described in Table 5-7.

Table 5-7 Movement and place performance of the built environment with the proposal

Built environment theme	User outcomes	Impact of proposal
Access and Connection	<ul style="list-style-type: none"> Mode choice Reliable transport Equity (of access) 	<ul style="list-style-type: none"> Encourage cycling due to the increased number of formal crossing opportunities and dedicated cycle paths Encourage walking due to the increased number of formal crossing opportunities, footpath widening and landscaping Encourage the shift to sustainable modes of travel Minimal impacts to bus travel due to the potential minor increase in travel time
Amenity and Use	<ul style="list-style-type: none"> Convenient facilities Local opportunities 	<ul style="list-style-type: none"> Improved end-of-trip facilities on Sydney Park Road, King Street between May Street and Goodsell Street, May Street and the Sydney Park car park along King Street/Princes Highway due to increased parking provision Impacts to end-of-trip facilities on Goodsell Street and Princes Highway (outside of clearway restrictions) due to reduced on-street kerbside parking
Green and Blue	<ul style="list-style-type: none"> A link to nature 	<ul style="list-style-type: none"> Improved vegetation and tree canopy cover due to landscaping
Comfort and Safety	<ul style="list-style-type: none"> Comfortable environment Low risk 	<ul style="list-style-type: none"> Improved road user safety due to increased number of formal crossing opportunities, footpath widening, dedicated cycleways and speed limit reductions Improved environmental quality due to increased vegetation cover, heavy vehicle separation and reduced urban heat-island effect and vehicle noise and air pollution
Character and Form	<ul style="list-style-type: none"> Human-scaled Distinct features 	<ul style="list-style-type: none"> Improved access due to increased number of formal crossing opportunities Improved dwellable street space due to dynamic community spaces, footpath widening and dedicated cycleways

5.2.7 Summary of impacts of the proposal during operation

The potential impacts of the proposal during operation have been identified as follows:

- Improved safety for pedestrians and cyclists due to an increased number of formal crossing opportunities, separation between pedestrians, cyclists and traffic and reduction in traffic volumes and speed limits
- Improved pedestrian movement due to an increased number of formal crossing opportunities, footpath widening and landscaping

- Improved pedestrian place due to a reduction in traffic lanes and traffic volumes, footpath widening and landscaping
- Improved cyclist movement due to an increased number of formal crossing opportunities and dedicated cycle paths
- Minimal impacts to buses
- Reduced on-street kerbside parking on Sydney Park Road, King Street and Princes Highway. Increased on-street kerbside parking, and inclusion of angled parking, on May Street.
- Relatively minor and manageable impacts on general traffic and freight customers when considered in the context of the positive impacts of the proposal on the movement and place performance for active transport customers
- As per the *Practitioner's Guide to Movement and Place*, significantly improved overall movement and place performance of the surrounding built environment. The proposal would generally improve all of the five built environment themes and contribute to a well-designed built environment.

5.2.8 Cumulative operation impacts

As discussed in Section 4 and 5.1.6, several developments or activities are committed or currently being constructed near the proposal. The cumulative operation impacts of these nearby developments or activities have been summarised qualitatively in Table 5-8 and include:

- Altered traffic patterns in the proposal area, with Euston Road and Campbell Street / Campbell Road replacing Sydney Park Road, King Street (south of Lord Street) and Princes Highway (north of Campbell Street) as part of the major east-west route linking St Peters and Moore Park via Alexandria and Waterloo
- Improved traffic flow, road safety and trip reliability along the nearby Alexandria to Moore Park corridor
- Increased demand for travel across all customer modes in and near the proposal area.

Table 5-8 Cumulative operation impacts

Project description	Cumulative operation impacts
WestConnex M4-M5 Link The M4-M5 Link will consist of twin 7.5-kilometre mainline motorway tunnels between the M4 East at Haberfield and the New M5 at St Peters and sized to accommodate up to four lanes of traffic in each direction. The tunnels will also include a new interchange at Rozelle that would connect the M4-M5 Link tunnels with City West Link, Anzac Bridge, Iron Cove Link and the proposed future Western Harbour Tunnel and Beaches Link. Construction of the project is expected to be completed by 2023.	Cumulative operation impacts are expected to include a decrease in heavy vehicle traffic on the nearby road network, including on Princes Highway, as well as reduced travel times across the wider road network. Additional traffic volumes are expected on Euston Road and Campbell Road / Campbell Street due to vehicles travelling to and from the St Peters interchange.
Sydney Gateway Sydney Gateway will provide direct high-capacity road connections linking the Sydney motorway network at the St Peters interchange with Sydney Airport and Port Botany. Stage 1 of Sydney Gateway will comprise a new high-capacity four-lane road in each direction connecting the St Peters interchange with Sydney Airport's International Terminal and Qantas Drive. Stage 3 will include a high-capacity connection between Sydney Airport's Domestic Terminals and St Peters interchange. Construction is expected to complete by 2023.	Cumulative operation impacts are expected to include a decrease in heavy vehicle traffic on the nearby road network, including on Princes Highway and Sydney Park Road, as well as reduced travel times across the wider road network. Additional traffic volumes are expected on Euston Road and Campbell Road / Campbell Street due to vehicles travelling to and from the St Peters interchange.

Project description	Cumulative operation impacts
<p>Alexandria to Moore Park</p> <p>The Alexandria to Moore Park Connectivity Upgrade is located to the north-east of the proposal and involves intersection, safety and amenity improvements along the Alexandria to Moore Park corridor (Euston Road, McEvoy Street, Lachlan Street, Dacey Avenue and Alison Road). Construction of Stage 1 is expected to commence in mid-2020 and would take around 36 months to complete.</p>	<p>Cumulative operation impacts are expected to include improved traffic flow, road safety and trip reliability along Euston Road and the nearby Alexandria to Moore Park road corridor.</p>
<p>Visy Dry Recyclables Facility</p> <p>The State Significant Development application for the construction and operation of a waste transfer and materials recovery facility at 112-120 Euston Road, Alexandria was approved in April 2020. The facility would be fully enclosed within an existing industrial building, with all unloading, sorting and processing to be undertaken indoors. A completion date for construction is not yet determined.</p>	<p>Cumulative operation impacts are expected to include a small increase in operational traffic on Euston Road.</p>
<p>Ashmore Precinct</p> <p>The Ashmore Precinct is located in Erskineville and next to Alexandria, bounded by Ashmore Street, Mitchell Road, Coulson Street and the Illawarra Railway line and would redevelop an industrial site into a sustainable neighbourhood consisting of about 3,785 homes, a commercial/retail centre, a central park (McPherson Park) and bike links. The development is likely to be completed by 2025.</p>	<p>Cumulative operation impacts are expected to include additional demand for travel for all customer groups on roads in and near the proposal area, particularly near developments to the north of the proposal.</p>

6. Mitigation and management measures

The majority of long-term impacts of the proposal have been addressed through the process of design and include:

- Provision for active transport customers by maintaining or improving existing active transport facilities within the footprint of the proposal
- Management of capacity constraints to be addressed through the operation of existing traffic signals and other road network treatments.

Residual impacts of the proposal that arise from construction activities, and which cannot be removed through the design, are considered manageable. The proposed mitigation and management measures would be reconfirmed as the proposal progresses and as more detailed construction management plans are developed.

A summary of mitigation and management measures is provided in Table 6-1.

Table 6-1 Mitigation and management measures

Impact	Mitigation / management measure	Phase	Responsible party
Public transport network changes during construction	Bus operators, TfNSW, the City of Sydney and Inner West Council (as relevant) would be consulted, and the community would be informed of, any temporary changes to bus stop operation.	Construction	Construction contractor
General traffic and freight performance during construction	Ongoing consultation would be undertaken with Transport Coordination, City of Sydney, Inner West Council, emergency services and bus operators to minimise transport and traffic impacts during construction.	Construction	Construction contractor
General traffic and freight performance during construction	Implement a variable message sign strategy to encourage through and regional traffic to use Euston Road and Campbell Street / Campbell Road instead of Princes Highway and Sydney Park Road.	Construction	Construction contractor
General traffic and freight performance during construction	Construction vehicle movements would be minimised during peak periods.	Construction	Construction contractor
Safety around construction site accesses	Vehicle access to and from construction sites would be managed to ensure pedestrian, cyclist and driver safety. This may require manual supervision, physical barriers and / or temporary traffic control.	Construction	Construction contractor
Construction personnel parking	Construction personnel parking would be provided on site and parking on local streets would be kept to a minimum	Construction	Construction contractor
General traffic and freight performance during operation	An operational traffic review would be undertaken to confirm the operational traffic impacts of the proposal on the surrounding road network. This would be undertaken as part of the ongoing post-opening operational traffic review that has been committed to as part of the WestConnex project.	Operation	TfNSW
General traffic and freight performance during operation	Undertake ongoing network optimisation using the existing traffic signal control system (SCATS) by minimising intersection and midblock delays to ensure travel time savings are achieved to the greatest possible extent.	Operation	TfNSW