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LOCAL AREA TRAFFIC MANAGEMENT ASSESSMENT

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GLOSSARY OF TERMS AND ABBREVIATIONS

Term / Acronym	Definition
RMS	Roads and Maritime Services
BTS	Bureau of Transport Statistics
TfNSW	Transport for New South Wales
JTW	Journey to Work data provided by the ABS
ABS	Australian Bureau of Statistics
TZ	Transport zone: A spatial level defined by the BTS and used in their strategic transport modelling
LoS	Level of Service
RUM	Road User Movement
LATM	Local Area Traffic Management

1. INTRODUCTION

1.1 BACKGROUND

As part of the WestConnex project, the proposed "new" M5 is currently being constructed between King Georges Road interchange and a new multi-level interchange at St Peters. WestConnex also proposes to connect the new M5 with the M4 (known as the "M4-M5 link"). The St Peters interchange is forecast to increase traffic volumes on the local road network surrounding the interchange.

City of Sydney (CoS) has commissioned Bitzios Consulting to develop a traffic microsimulation model to quantify the benefits of Local Area Traffic Management (LATM) schemes being considered to assist with the management of the additional traffic from the WestConnex project affecting the Alexandria, Erskineville and St Peters areas.

The proposed interchange at St Peters is due to open to traffic in 2019, servicing the new M5 initially as well as servicing the proposed M4-M5 link when it is open in 2023. Upon opening in 2023, it is expected the daily traffic volume on Euston Road will increase by up to 80%. As part of the WestConnex project, it is proposed to increase the capacity of the state road network surrounding the St Peters Interchange. This includes an additional travel lane on Euston Road.

Significant congestion is currently experienced on Euston Road in the weekday morning and afternoon peak periods and also on weekends. Whilst an upgrade of Euston Road is proposed, it is probable that the increase in traffic volumes from WestConnex will be greater than the increase in capacity on Euston Road, encouraging vehicles to use nearby local roads to avoid delays. In order to maintain the amenity of local roads to deter "through" traffic from using these roads, CoS is considering implementing local area traffic management schemes.

1.2 STUDY AREA

The study area is located within the inner Sydney suburbs of Alexandria, Erskineville and St Peters. It is bound by the following roads:

- Henderson Road to the north;
- Mitchell Road to the west;
- Sydney Park Road, Euston Road and McEvoy Street to the south; and
- Botany Road to the east.

The study area is shown below in Figure 1.1.

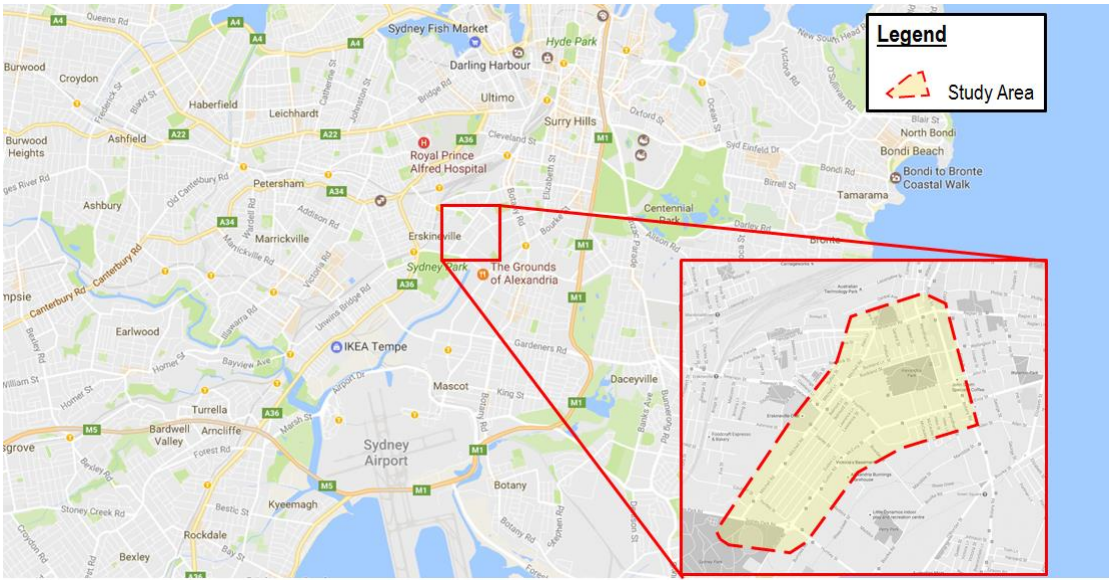


Figure 1.1: Study Area

1.3 SCOPE AND OBJECTIVES

The purpose of this project is to develop a local area traffic management (LATM) plan to limit the effects of increased traffic volumes from the WestConnex project on the surrounding local road network. The objectives of the study include:

- develop an existing condition microsimulation traffic model in VISSIM including all key roads within the study area;
- use the existing condition model to create a future year model to quantify the impacts of future traffic associated with the St Peters Interchange on the residential precincts of Alexandria, Erskineville and St Peters;
- identification of measures to protect the amenity of local streets in Alexandria, Erskineville and St Peters and limit traffic associated with the St Peters Interchange to the State Road network without limiting current levels of property access and supporting opportunities to prioritise sustainable transport modes;
- test, optimise and evaluate the proposed LATM options, in order to determine the future traffic performance within the study area; and
- assisting CoS in estimating the cost of the proposed upgrades.

1.4 REPORT STRUCTURE

The structure of this report following this chapter is as follows:

- **Chapter 2 – *Existing Traffic and Transport Conditions* –** Provides the context of existing traffic conditions within the study area, overview of the base model coding and model calibration and validation outcomes;
- **Chapter 3 – *Existing Conditions Traffic Model* –** Provides a summary of the development of a calibrated and validated traffic model for the study area;
- **Chapter 4 – *Existing Network Performance* –** Includes a summary of the existing traffic performance within the study area;
- **Chapter 5 – *Local Area Traffic Management Proposals* –** Provides an overview of the proposed LATM measures;
- **Chapter 6 – *Future Development/Road Improvements* –** Provides an overview of the major committed developments which are likely to impact traffic generation and distribution within the study area;
- **Chapter 7 – *Future Traffic Generation* –** Includes the methodology for estimating the growth of existing traffic and estimating the additional traffic volumes from WestConnex for 2021:
- **Chapter 8 – *Options Assessment* –** Includes an assessment summary of each LATM proposal; and
- **Chapter 9 – *Conclusion and Conclusions* –** Summarises the key findings from this study.

2. EXISTING TRAFFIC AND TRANSPORT CONDITIONS

2.1 ROAD HIERARCHY

The road network contained within the study area is a mix of local, regional and state roads. Many of the major roads are used as connections between the eastern suburbs and the inner western suburbs of Sydney, as access to and from the Princes Highway, by visitors to Sydney Park and by workers and residents of the area. Accordingly, high volumes of through traffic pass through the area. The classification of the roads within the study are:

- State Roads:
  - Euston Road;
  - Fountain Street;
  - McEvoy Street;
  - Mitchell Road (between Fountain Street and Copeland Street);
  - Henderson Road (between Wyndham Street and Botany Road); and
  - Sydney Park Road.
- Regional Local Government Roads:
  - Mitchell Road (between Fountain Street and Henderson Road);
  - Henderson Road (between Mitchell Road and Wyndham Street); and
  - Wyndham Street.
- Local Roads:
  - all other streets.

The study area's road hierarchy is shown in Figure 2.1.

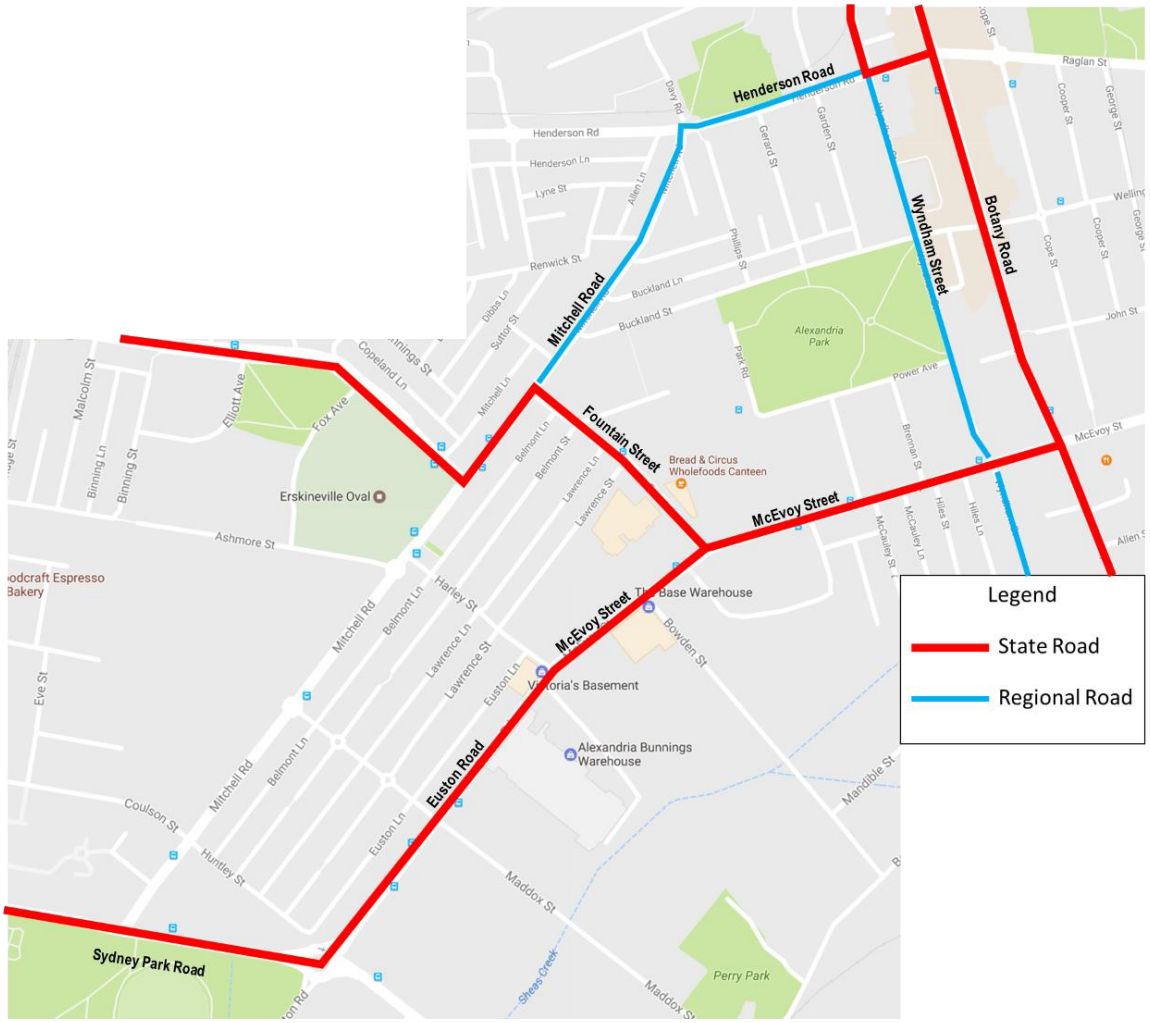


Figure 2.1: Road Hierarchy

2.2 SPEED ENVIRONMENT

The roads within the study area have two signposted speed speeds and include two school zones, as summarised below.

- 60km/h:
  - Euston Road;
  - McEvoy Street;
  - Fountain Street;
  - Henderson Road; and
  - Sydney Park Road.
- 40km/h:
  - Buckland Street;
  - Buckland Lane; and
  - Anderson Street.
- 50km/h:
  - all other streets.

Figure 2.2 shows the different speed limits within the study area. There are School Zones on Mitchell Road, on Park Road and on Park Avenue where 40kph speed restrictions apply between 8.00am and 9.30am and between 2.30pm and 4.00pm on school days.

Source: Google Maps

Figure 2.2: Speed Environment

2.3 SURROUNDING LAND USES

As defined by the *Sydney Local Environment Plan 2012 Land Zoning Map 10 and 11* the study area contains the following land use zones:

- B4 Mixed Use;
- R1 General Residential;
- RE1 Public Recreation; and
- SP2 Infrastructure.

Surrounding the study area are also zones of Enterprise Corridor, Business Park and Local Centre. The land use zones are shown in Figure 2.3.

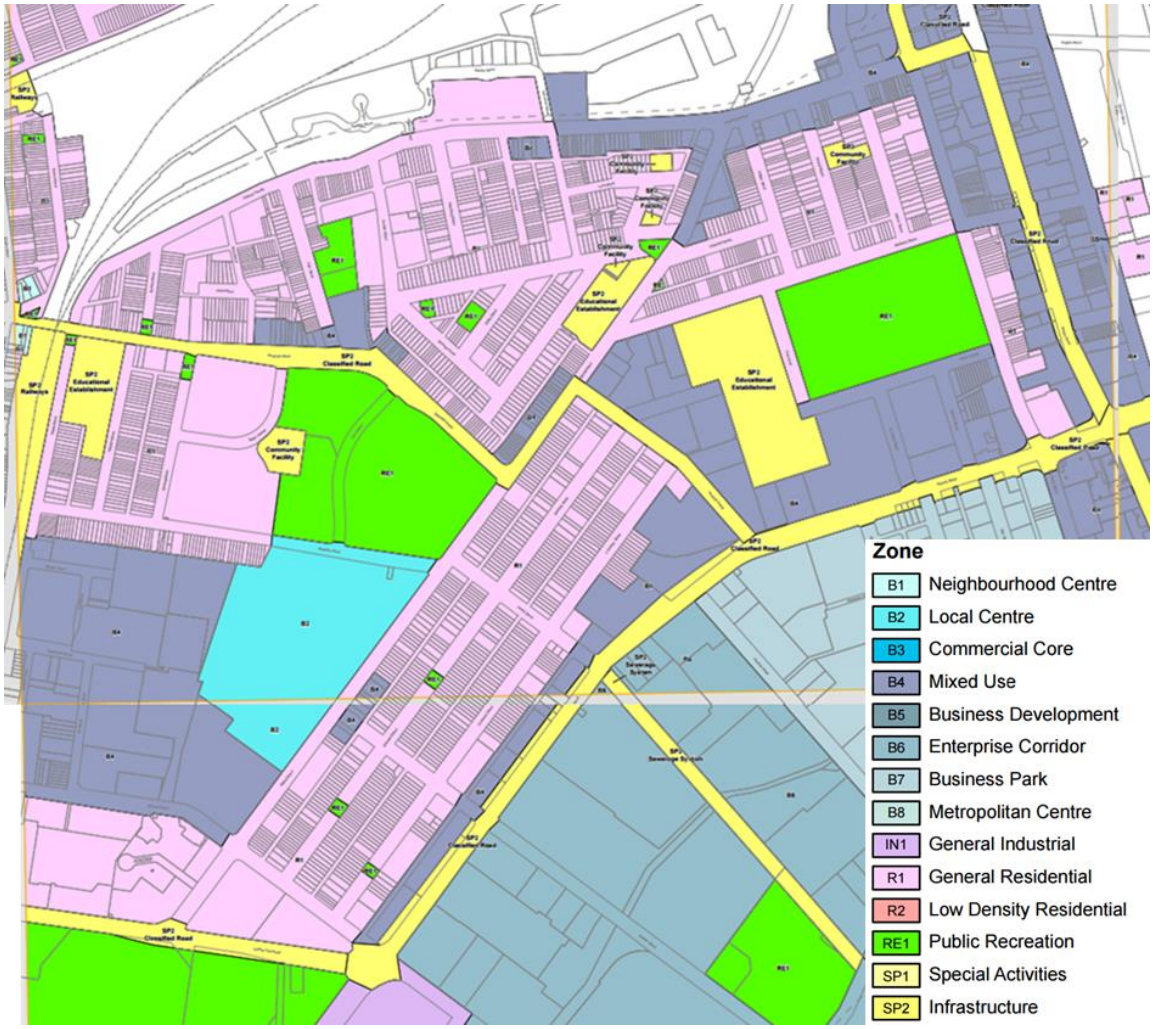


Figure 2.3: Land Use

2.4 WALKING AND CYCLING FACILITIES

2.4.1 Walking

Footpaths are provided on both sides of the road throughout the study area, along with shared path facilities, pedestrian crossings, pedestrian refuges and signalised crossing points, providing a high level of active transport connectivity and safety. The locations of pedestrian crossing points and shared paths are shown in Figure 2.4.

Figure 2.4: Pedestrian Crossing Points and Shared Paths

2.4.2 Cycling

The study area contains separated cycleways, cycling lanes and "bicycle-friendly" roads. In general, the network connectivity is very good, although there is a lack of connection between Belmont Street and Buckland Street. The following facilities are provided:

- Separated Dedicated Cycleways:
  - Sydney Park Road;
  - Mitchell Road (between Sydney Park Road and Huntley Street);
  - Huntley Street between Mitchell Road and Belmont Street;
  - Alexandria Park; and
  - Buckland Street.
- Dedicated Cycling Lanes:
  - Maddox Street (Between Lawrence Street and Euston Road.

- Bicycle Friendly Roads:
  - Belmont Street;
  - Maddox Street (between Belmont Street and Lawrence Street)
  - Harley Street;
  - Mitchell Road (between Ashmore Street and Harley Street);
  - McEvoy Street (between Harley Street and Bowden Street);
  - Park Road;
  - Power Avenue (between Park Road and Loveridge Street);
  - Phillips Street; and
  - Henderson Road between Mitchell Road and Gerard Street).

The locations of existing bicycle routes are shown in Figure 2.5.

Figure 2.5: Existing Bicycle Routes

2.5 PUBLIC TRANSPORT

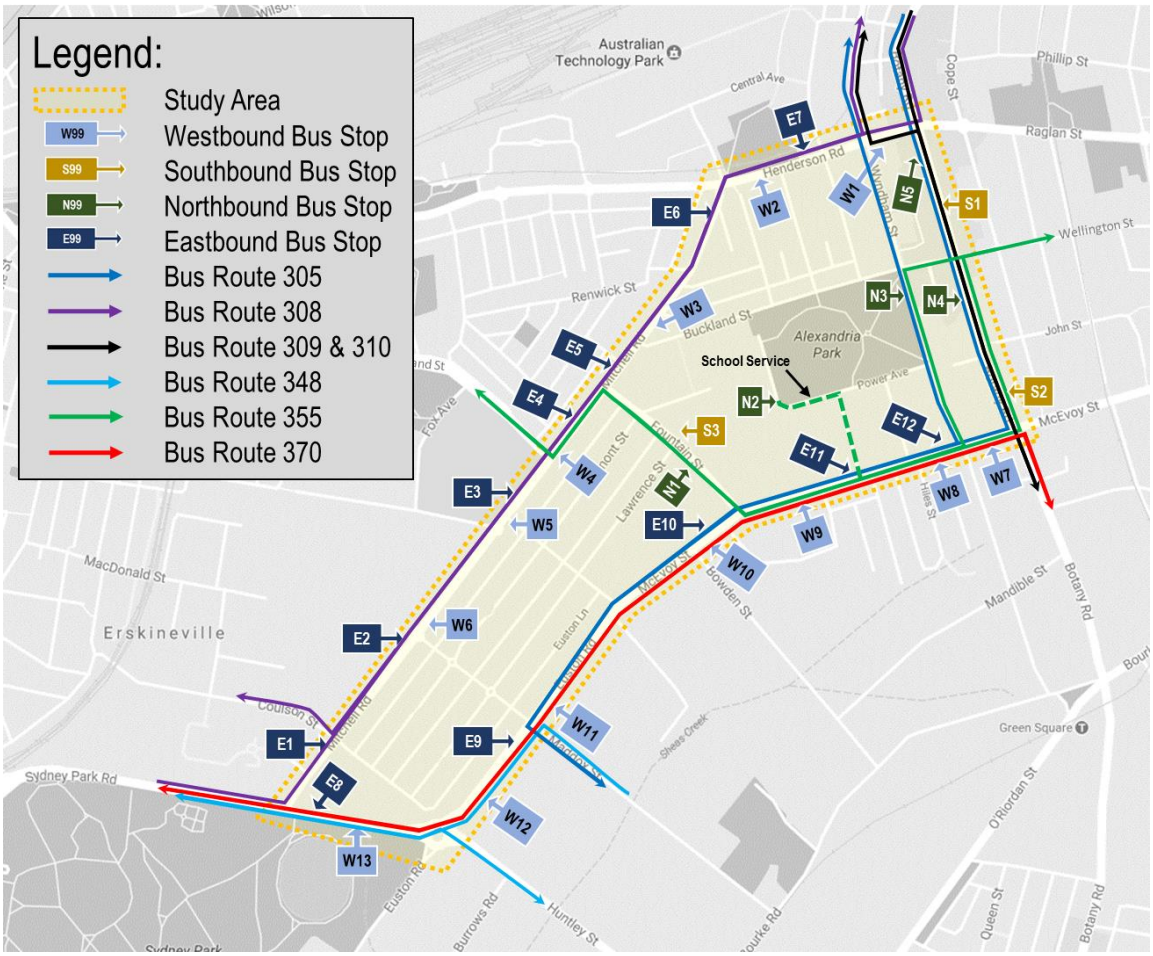
2.5.1 Bus Services

The study area is serviced by Sydney Buses, with seven routes running within the study area. Buses predominantly run along Mitchell Road, Euston Road/McEvoy Street and Botany Road with other services operating on Sydney Park Road, Henderson Road and Wyndham Road. Services are generally high in frequency across all days of the week and all peak periods, with reduced operations overnight.

Some bus services have a different travel path in each travel direction, influenced by either one-way roads. These bus routes are as follows:

- Route 305;
- Route 308;
- Route 309;
- Route 310;
- Route 348; and
- Route 355. This bus service also has a school route detour twice in the AM peak and twice in the PM peak.

The designated bus routes and bus stops are shown in Figure 2.6, and route frequencies are summarised in Table 2.1.



Source: NSW Transport

Figure 2.6: Bus Stop Locations and Bus Service Routes

Table 2.1: Bus Frequencies Summary

Route 305 – Railway Square to Stamford Plaza Hotel via McEvoy St and Wyndham Rd/Botany Rd		
Weekday Frequency	Peak	Every 20-30mins
	Off-peak	No Services
Weekend Frequency	Saturday	No Services
	Sunday	No Services
Route 308 – Marrickville Metro to City via Mitchell Rd and Henderson Rd		
Weekday Frequency	Peak	Every 15-20 minutes
	Off-Peak	Every 30 minutes
Weekend Frequency	Saturday	Every 30 minutes
	Sunday	Every 40 minutes
Route 309 – Port Botany & Eastgardens to Railway Square via Botany Rd		
Weekday Frequency	Peak	Every 10-20 minutes
	Off-Peak	Every 20 minutes
Weekend Frequency	Saturday	Every 20-30 minutes
	Sunday	Every 30 minutes
Route 310 – Port Botany & Eastgardens to Railway Square via Botany Rd		
Weekday Frequency	Peak	Every 10-20 minutes
	Off-Peak	Every 20 minutes
Weekend Frequency	Saturday	Every 20-30 minutes
	Sunday	Every 30 minutes
Route 348 – Wolli Creek to Bondi Junction via Sydney Park Rd		
Weekday Frequency	Peak	Every 15-20 minutes
	Off-Peak	Every 30 minutes
Weekend Frequency	Saturday	Every 30 minutes
	Sunday	Every 30 minutes
Route 355 –Marrickville Metro to Bondi Junction via Mitchell Rd, Fountain St, McEvoy St and Wyndham St/Botany Rd (School Services on Loveridge St, Power Ave and Park Rd)		
Weekday Frequency	Peak	Every 30 minutes
	Off-Peak	Every 30 minutes
Weekend Frequency	Saturday	Every 30 minutes
	Sunday	Every 30 minutes
Route 370 – Market Place Leichhardt to Coogee via McEvoy St/Euston Rd and Sydney Park Rd		
Weekday Frequency	Peak	Every 10-20 minutes
	Off-Peak	Every 20 minutes
Weekend Frequency	Saturday	Every 15-30 minutes
	Sunday	Every 15-30 minutes

Source: https:/ tp.transportnsw.info/nsw

2.5.2 Rail Services

No train stations or train lines lie within the study area. The nearest train station is Erskineville Station and St Peters Station, approximately 200m west of the study area. Train services from these stations access the City and Liverpool, via Bankstown.

2.6 INTERSECTIONS

A number of intersections, within the study area, were assessed for their performance. These include:

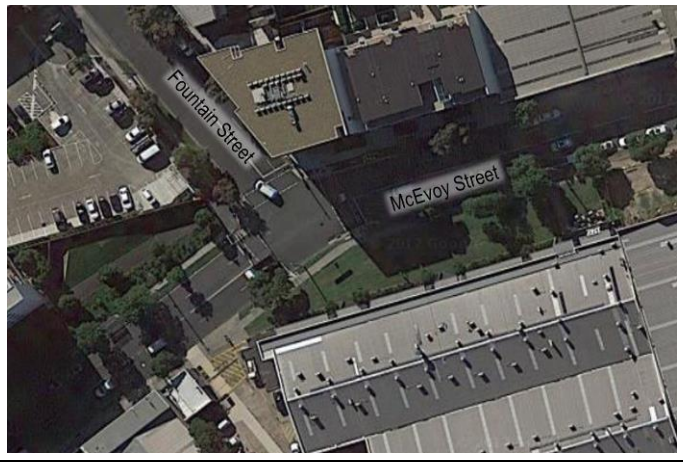
- Sydney Park Road/Mitchell Road;
- Sydney Park Road/Euston Road/Huntley Street;
- Mitchell Road/Copeland Street;
- Mitchell Road/Fountain Street;
- Mitchell Road/Henderson Road;
- Henderson Road/Wyndham Street;
- Henderson Road/Botany Road;
- McEvoy Street /Botany Road;
- McEvoy Street/Fountain Street; and
- McEvoy Street/Wyndham Street.

Table 2.2 provides a description of the layout of the existing key intersections.

Table 2.2: Road Environment by Intersection

Intersection		Description	Intersection Layout
Sydney Park Road	Mitchell Road	The intersection is a median separated signalised intersection with three main traffic legs and one access to Sydney Park. Sydney Park Road provides two through lanes for general traffic lanes in both directions, a right turn short lane on eastern leg and a left turn short lane on western leg. Mitchell Road has two lanes on the approach to the intersection with one allowing right turn movements and the other allowing all turning and through movements.	
	Euston Road	The intersection is four legged roundabout with two travel lanes, apart from the exit onto Huntley Street which is a single travel lane. The Euston Road approach from the north has two lanes, with one allowing right turn movement and the other allowing all turning and through movements. The southern approach on Euston Road has two lanes, with the left lane allowing left turn movements only and the right lane allowing through and right turn movements. Sydney Park Road, from the west, has two approach lanes with the left allowing left turn movements only and the right hand lane allowing through and right turn movements.	

Intersection		Description	Intersection Layout
Mitchell Road	Copeland Street	Mitchell Road meets Copeland Street at a signalised T-intersection, where Mitchell Road provides two lanes for through traffic in both travel directions. Copeland Street has two lanes on the approach to the intersection, with the left short lane allowing left turn movements and the right hand lane allowing right turn movements.	
	Fountain Street	Mitchell Road meets Fountain Street at a signalised T-intersection, where Mitchell Road provides two lanes for through traffic in both travel directions. Fountain Street has two lanes on the approach to the intersection, with the left short lane allowing left turn movements and the right hand lane allowing right turn movements.	
	Henderson Road	The intersection is a four-way signalised intersection, Mitchell Road meets Henderson Road and Davy Road. Mitchell Road has two approach lanes from the southern approach, with the right hand lane allowing right turn movements only and the left hand lane allowing all turning and through movements. Henderson Road, from the eastern approach, has three lanes, with one lane for left turn, through and right turn movements separately, as does Davy Road from the northern approach. The western approach, on Henderson Road, has two through lanes and a short right turn lane.	

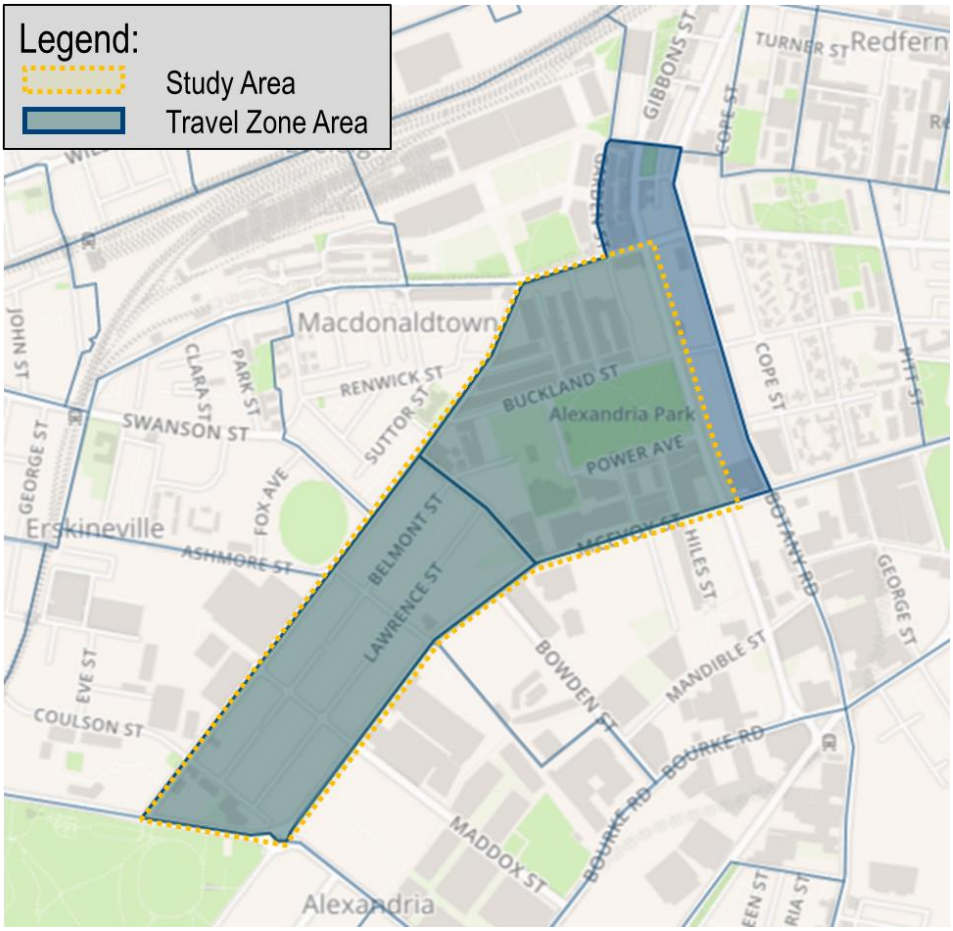
Intersection		Description	Intersection Layout
Henderson Road	Botany Road	The intersection is a four-way signalised intersection, with four approaches and three exits. The northern approach on Botany Road is a one way southbound road. Botany Road, from the northern approach, has four approach lanes with two allowing right turn movement only, one for through movement and the left hand lane allowing through and left turn movements. Henderson Road has two travel lanes on the western approach, with through movements allowed from both lanes and right turns allowed from the right hand lane. Botany Road from the southern approach has two travel lanes with left turn movements only allowed.	
	Wyndham Street	The intersection is a four-way signalised intersection with three approaches and four exits, as Wyndham Street on the north is an exit only. Henderson Road, on the eastern and western approaches, is median divided, with two through lanes of traffic on each approach. There is a short left turn only lane on the western approach and two right turn only lanes on the eastern approach to the one way northbound Wyndham Street. Wyndham Street, on the southern approach, has two lanes for through traffic, with left turns allowed from the left lane and right turns allowed from the right lane.	
McEvoy Street	Fountain Street	McEvoy Street meets Fountain Street at a signalised T-intersection, where McEvoy Street provides two lanes for through traffic in both travel directions. Fountain Street has two lanes on the approach to the intersection, with the left short lane allowing left turn movements and the right hand lane allowing right turn movements.	

Intersection		Description	Intersection Layout
	Botany Road	This is a 4-way signalised intersection, with approaches from the east and west on McEvoy Street and the north and south on Botany Road. Each approach has two travel lanes, with left turns allowed from the left turn lane. Right turn movements are banned from the eastern approach on McEvoy Street and southern approach on Botany Road. Right turn movements are allowed from the right hand lane on the western and northern approaches.	
	Wyndham Street	This is a 4-way signalised intersection with approaches from the east and west on McEvoy Street and the north and south on Wyndham Street. Each approach has two travel lanes, with left turns allowed from the left turn lane. Right turn movements are banned from the western approach on McEvoy Street. Right turn movements are allowed from the right hand lane on the eastern, southern and northern approaches.	

2.7 DEMOGRAPHICS

2.7.1 Population

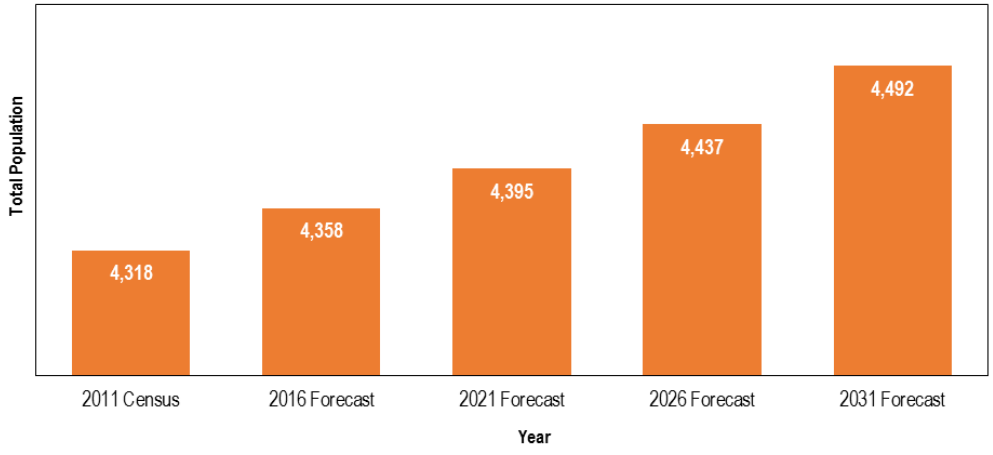
Population forecasts profiled by the NSW Bureau of Transport Statistics (BTS) which is based on ABS 2011 Census data, is shown in Figure 2.8. The ABS data used has been combined for Travel Zones (TZ) 258 and 261, representing the study corridor as per Figure 2.7.



Source: NSW BTS Data

Figure 2.7: Travel Zones Included

The data indicates that the population is expected to increase from the 2011 Census figure of 4,318 residents to 4,492 by 2031. This represents an overall growth of approximately 4%.

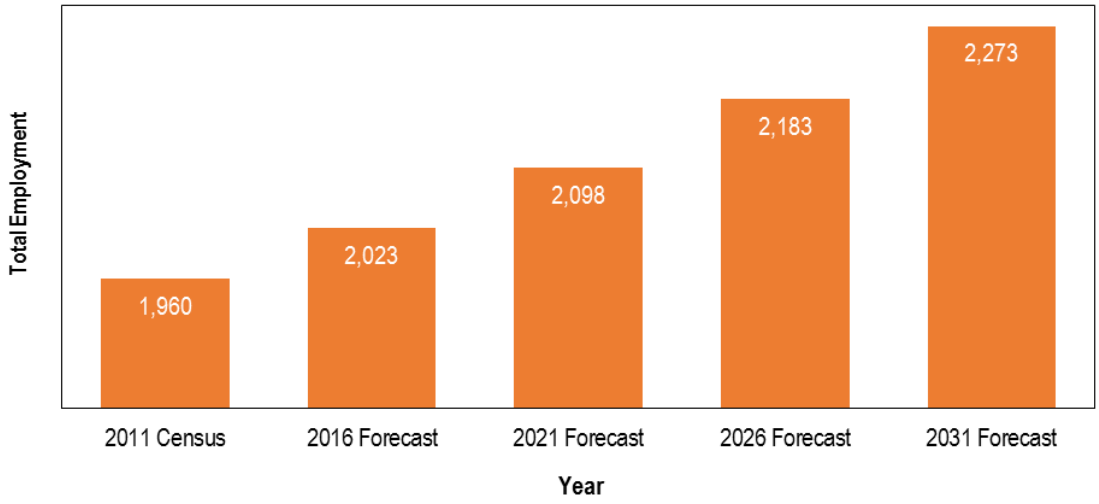


Source: NSW BTS Data

Figure 2.8: Population Growth Forecast

2.7.2 Employment

The number of persons employed within the study area is forecast to increase by approximately 300 jobs, from 1960 in year 2011 to 2273 in year 2031, as shown in Figure 2.9. This represents an overall growth of approximately 16%.



Source: NSW BTS Data

Figure 2.9: Employment Growth Forecast

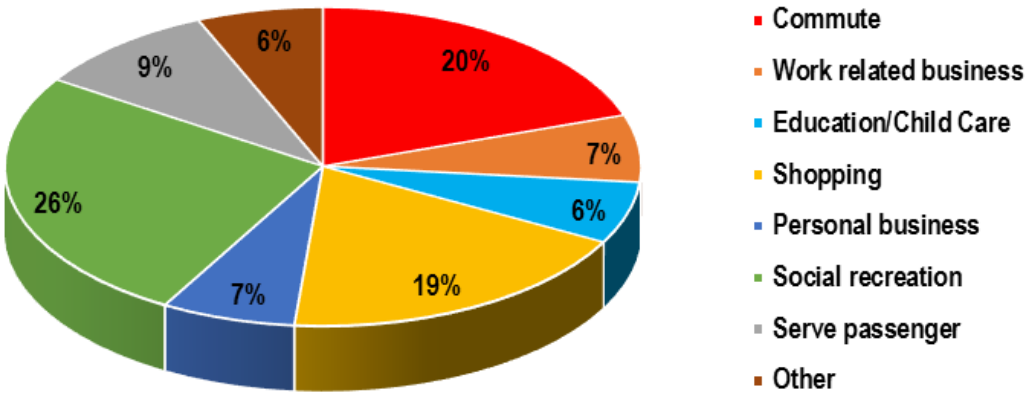
2.8 MODES OF TRAVEL

2.8.1 Current Travel Patterns

The study area is situated in the CoS LGA, where on average 733,000 trips are made on a weekday and 713,000 on average weekend day. Figure 2.10 shows the trip purpose splits from the Sydney LGA.

Work trips, including business trips, make up 27% of all trips. This is followed by social recreation and shopping trips with a 26% and 19% share respectively, whereas education or child care related trips account for 6% of the trips.

Although work trips make up approximately 27% of all trips, they account for 42% of all kilometres travelled. A total of 49% of the trips are made by walking with 30% made within vehicles whether as a driver or a passenger. Public transport has a 17% mode share of trips made.

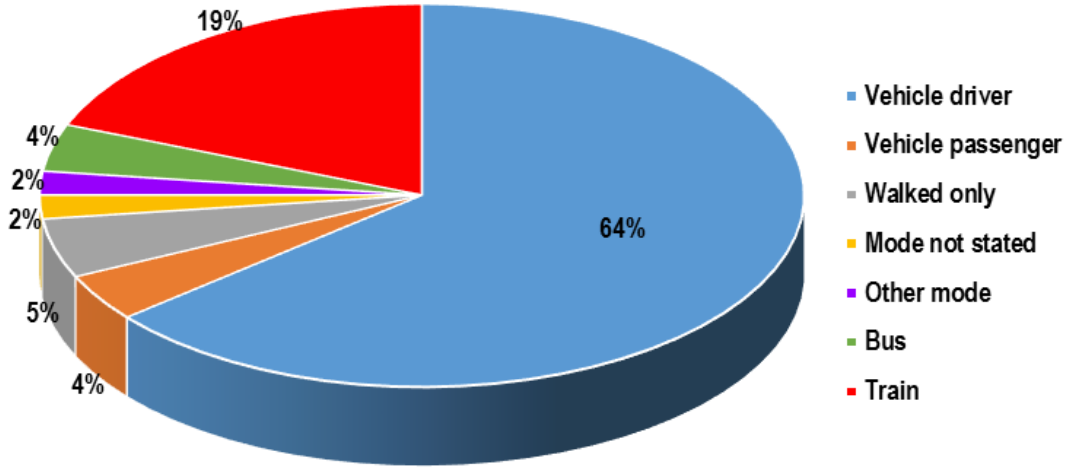


Source: NSW BTS Data

Figure 2.10: Purpose of Travel, CoS LGA

2.8.2 Modal splits for Journey to Work

Based on the BTS 2011 Household Travel Survey's 1,737 people are employed within the study area. Figure 2.11, below, shows the breakdown of trips by mode of travel. 68% of all work trips to the area are made by car, 23% by public transport and 5% are walking trips.



Source: NSW BTS Data

Figure 2.11: Mode of Travel (Inbound)

2.8.3 Trip Distribution

Journey to Work (JTW) data was analysed to understand the distribution of work trips to and from the study area. The inbound work trips distribution from the area is shown Table 2.3.

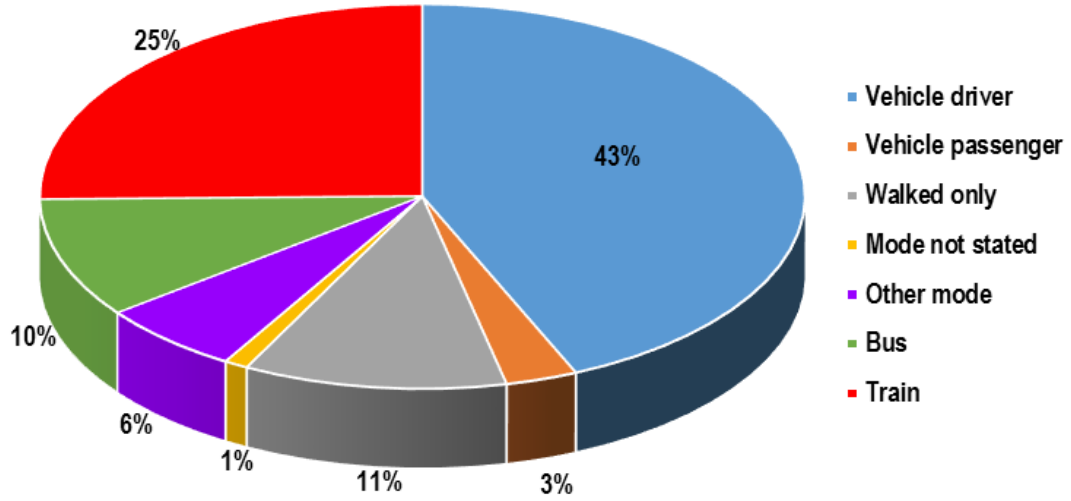
Approximately 22% of the inbound work trips travel to the study area from the Sydney Inner City area, with a number of other areas contributing between 3% and 7% of commuting trips. Workers from other areas not listed make up 36% of commuting trips to the study area, which makes it difficult to assess the full extent of travel composition.

Table 2.3: Daily Car Trips to the Study Area (Inbound)

Geographic Area	Number of Trips from Study Area	%
Sydney Inner City	388	22%
Eastern Suburbs - North	118	7%
Eastern Suburbs - South	102	6%
Kogarah - Rockdale	89	5%
Hurstville	77	4%
Bankstown	73	4%
Canterbury	73	4%
Strathfield - Burwood - Ashfield	68	4%
Cronulla - Miranda - Caringbah	59	3%
Botany	56	3%
Other	634	36%

Source: NSW BTS Data

The outbound trip travel mode breakdown is shown in Figure 2.12, below, indicating 46% of trips are made by private vehicle, 35% by public transport and 11% are walking trips.



Source: NSW BTS Data

Figure 2.12: Mode of Travel (Outbound)

Approximately 59% of trips were to Sydney Inner City with a variety of other areas making up between 2% and 7% of trips. Workers in areas not stated make up 13% of all outbound trips. The breakdown of outbound trips is as summarised in Table 2.4 below.

Table 2.4: Daily Car Trips from the Study Area (Outbound)

Geographic Area	Number of Trips from Study Area	%
Sydney Inner City	1660	59%
Botany	162	6%
North Sydney - Mosman	120	4%
Eastern Suburbs - North	108	4%
Eastern Suburbs - South	95	3%
Chastwood - Lane Cove	86	3%
Ryde - Hunters Hill	69	2%
Parramatta	57	2%
No Fixed Placed of Work	50	2%
Strathfield - Burwood - Ashfield	47	2%
Other	353	13%

Source: NSW BTS Data

2.9 VEHICLE VOLUMES

2.9.1 Intersection Counts

Intersection count data for the study area was made available by CoS for the following intersections (also see Figure 2.13):

- Sydney Park Road/Mitchell Road;
- Mitchell Road/Coulson Street/Huntley Street;
- Mitchell Road/Maddox Street;
- Mitchell Road/Ashmore Street/Harley Street;
- Mitchell Road/Copeland Street;
- Mitchell Road/Fountain Street;
- Mitchell Road/Buckland Street;
- Mitchell Road/Henderson Road;
- Henderson Road/Gerard Street;
- Henderson Road/Garden Street;
- Henderson Road/Wyndham Street;
- Wyndham Street/Buckland Street;
- Wyndham Street/Power Avenue;
- Wyndham Street/McEvoy Street;
- McEvoy Street/Brennan Street;
- McEvoy Street/Loveridge Street;
- McEvoy Street/Fountain Street;
- McEvoy Street/Euston Road/Harley Street; and
- Euston Road/Maddox Street.

Figure 2.13: Intersection Count Locations

2.9.2 Link Counts

Link traffic volumes were also made available by CoS. The survey period was 18th November 2016 to 25th November 2016, for the following locations:

- Mitchell Rd – Outside Property 177;
- Mitchell Rd – Outside Property 326;
- Mitchell Rd – Outside Property 240;
- Mitchell Rd – Outside Property 87;
- Mitchell Rd – Outside Property 7;
- Belmont Street – Outside Property 135;
- Lawrence Street - Outside Property 154;
- Lawrence Street - Outside Property 39;
- Fountain Street - Outside Property 15;
- Euston Road - Outside Property 40;
- McEvoy Street - Outside Property 102;
- McEvoy Street - Outside Property 50;
- Loveridge Street - Outside Property 8;
- Brennan Street - Outside Property 20;
- Wyndham Street - Outside Property 216;
- Power Ave - Outside Property 3;
- Wyndham Street - Outside Property 136A;
- Henderson Road - Outside Property 74;
- Henderson Road - Outside Property 33; and
- Henderson Road - Outside Property 10.

The locations are shown in Figure 2.14.

Figure 2.14: Link Count Locations

2.9.3 Roads and Maritime SCATS Data

SCATS data was recorded by Road and Maritime Services (RMS) on the 16th, 19th and 23rd November 2016, from 00:00 to 23:59 for the following intersections:

- TCS 48 – McEvoy Street / Wyndham Street;
- TCS 55 - Henderson Road / Wyndham Street;
- TCS 136 - Wyndham Street / Buckland Street;
- TCS 141 - Mitchell Road / Buckland Street;
- TCS 149 – Mitchell Road / Coulson Street / Huntley Street;
- TCS 748 – Euston Road / Maddox Street;
- TCS 934 – Henderson Road / Mitchell Road / Davy Road;
- TCS 1340 – Mitchell Road / Copeland Street;
- TCS 3087 – Mitchell Road / Sydney Park Road;
- TCS 3441 – Mitchell Road / Fountain Street;
- TCS 3579 – Henderson Road / Garden Street;
- TCS 4426 – McEvoy Street / Euston Road / Harley Street; and
- TCS 4440 – McEvoy Street / Fountain Street.

The locations of the signalised intersections are shown in Figure 2.15.

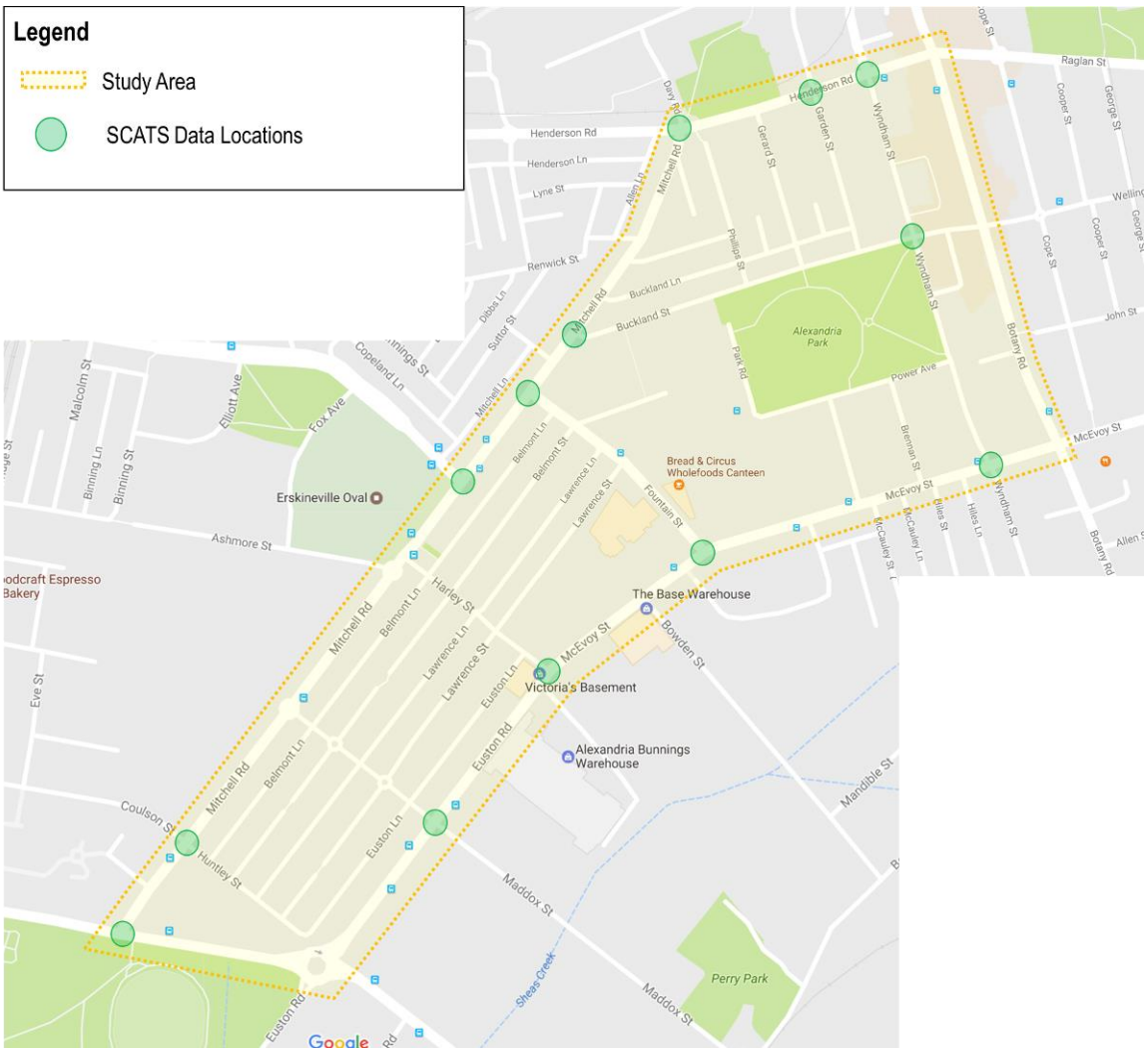


Figure 2.15: SCATS Data Locations

2.9.4 Travel Time Surveys

Bitzios Consulting commissioned travel time surveys on Wyndham Road – McEvoy Street – Euston Road – Sydney Park Road – Mitchell Road – Henderson Road, in both clockwise and counter-clockwise directions. The travel time surveys were conducted by Traffic Data and Control (TDC) for the AM, PM and the Saturday peak periods. For each direction, the route was split into six different sub-sections. The clockwise and counter-clockwise routes, including sub sections, are shown in Figure 2.16.

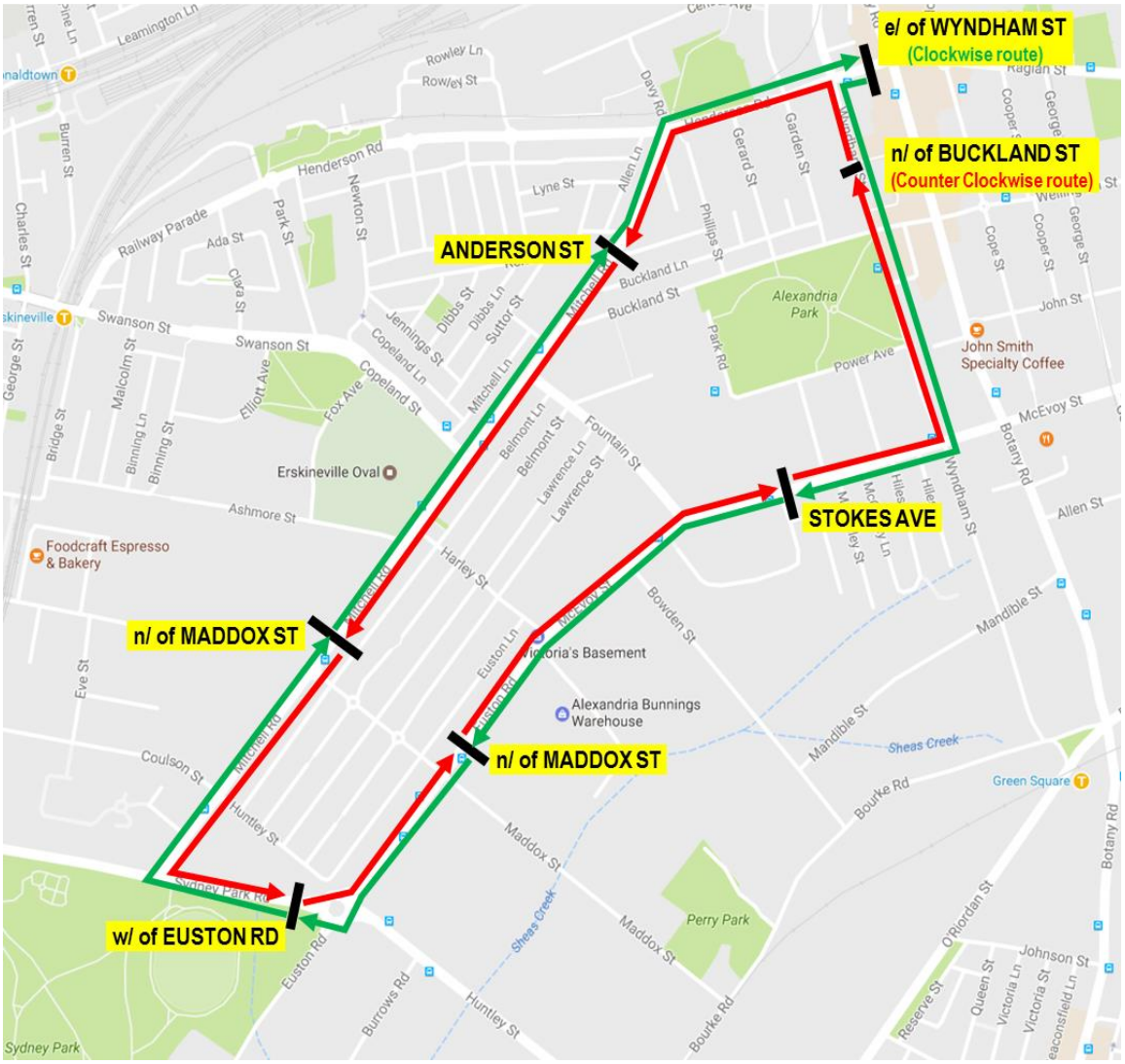


Figure 2.16: Travel Time Routes

2.9.5 Weekday AM Peak Period

The weekday AM peak turning movements at all key intersection within the corridor are summarised in Figure 2.17 below.

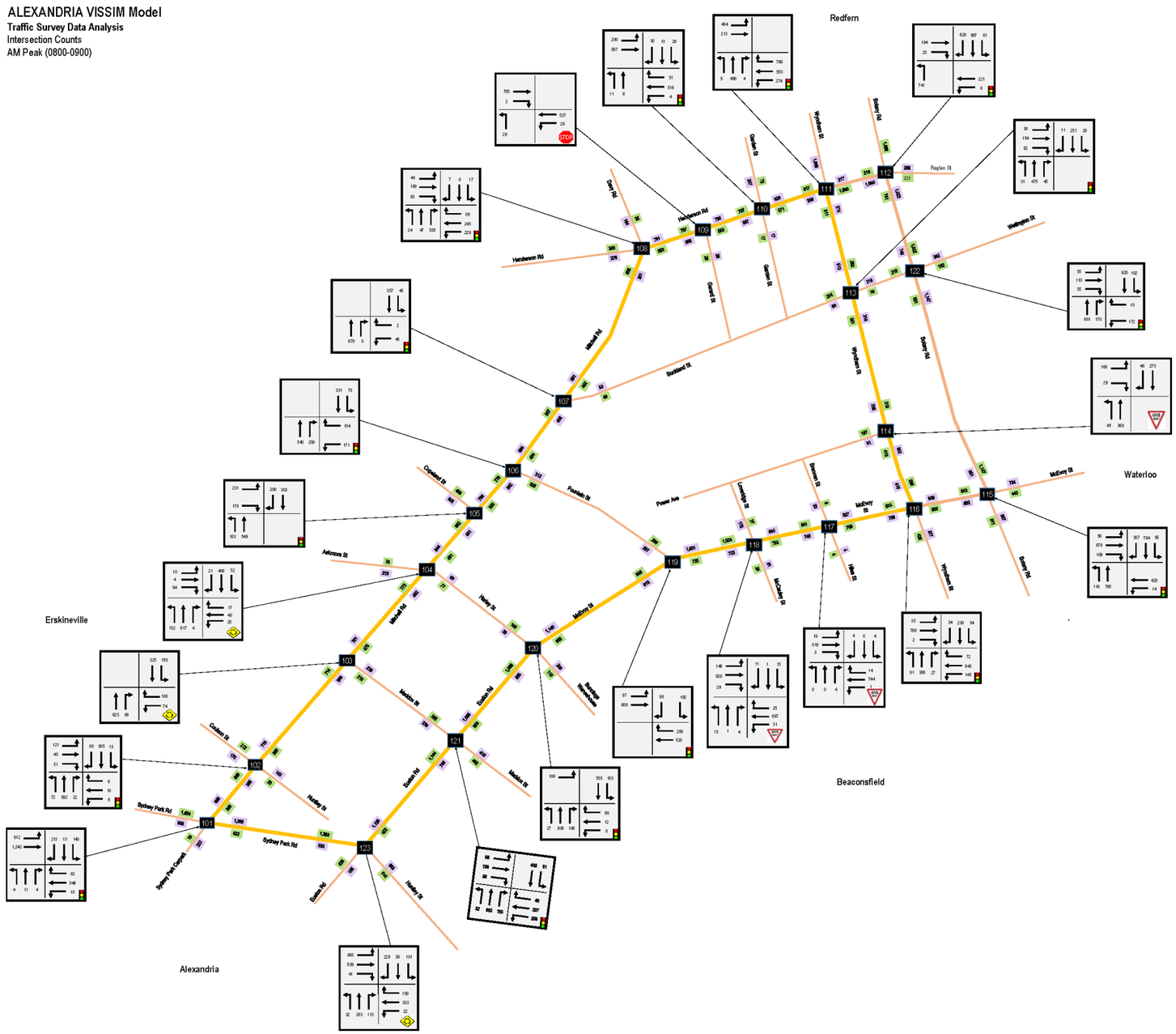


Figure 2.17: Weekday AM Peak Turning Movement Counts Summary

2.9.6 Weekday PM Peak Period

The weekday PM peak turning movements at all key intersection within the corridor are summarised in Figure 2.18 below.

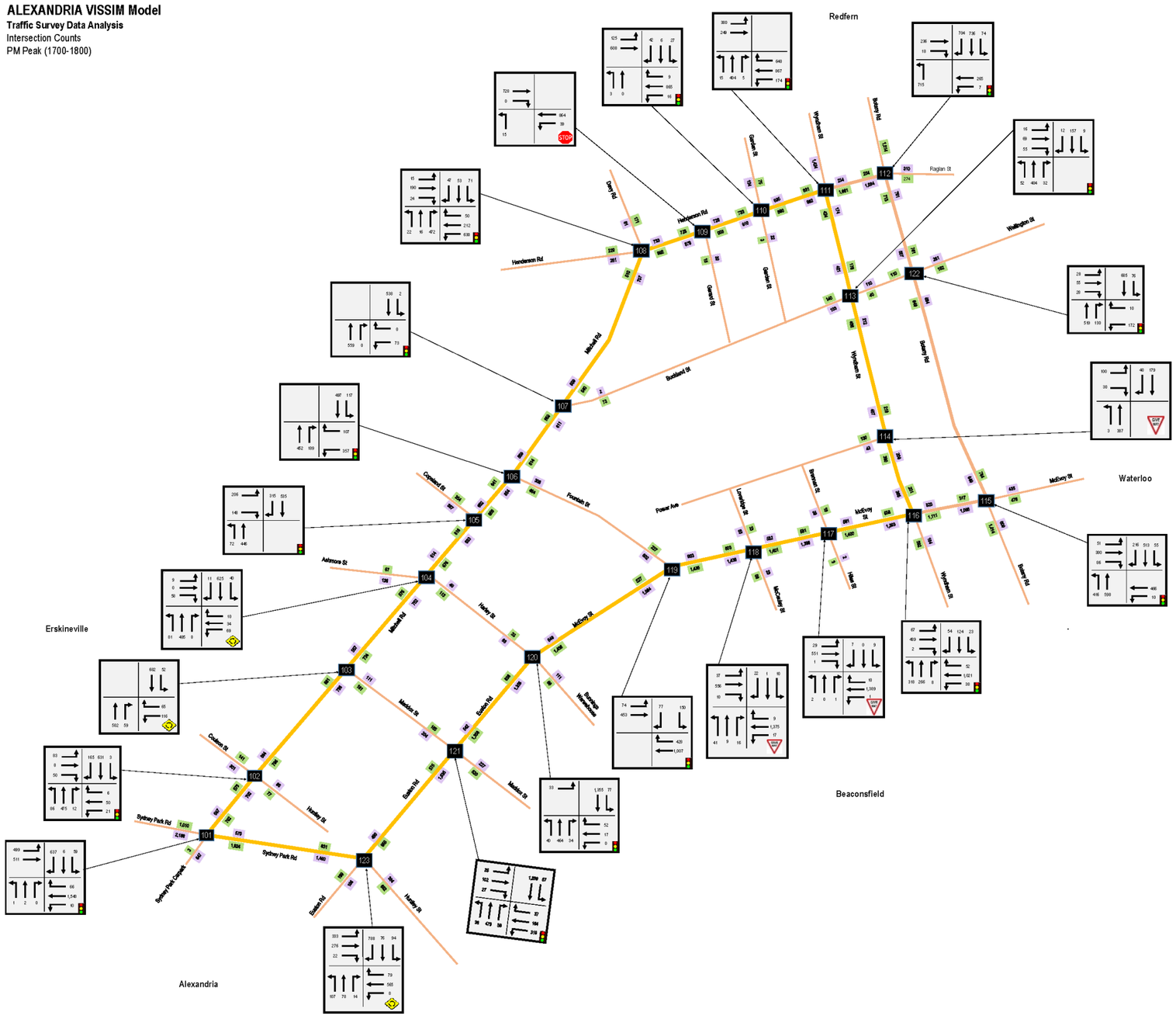


Figure 2.18: Weekday PM Peak Turning Movement Counts Summary

2.9.7 Weekend Midday Peak Period

The weekend midday peak turning movements at all key intersection within the corridor are summarised in Figure 2.19 below.

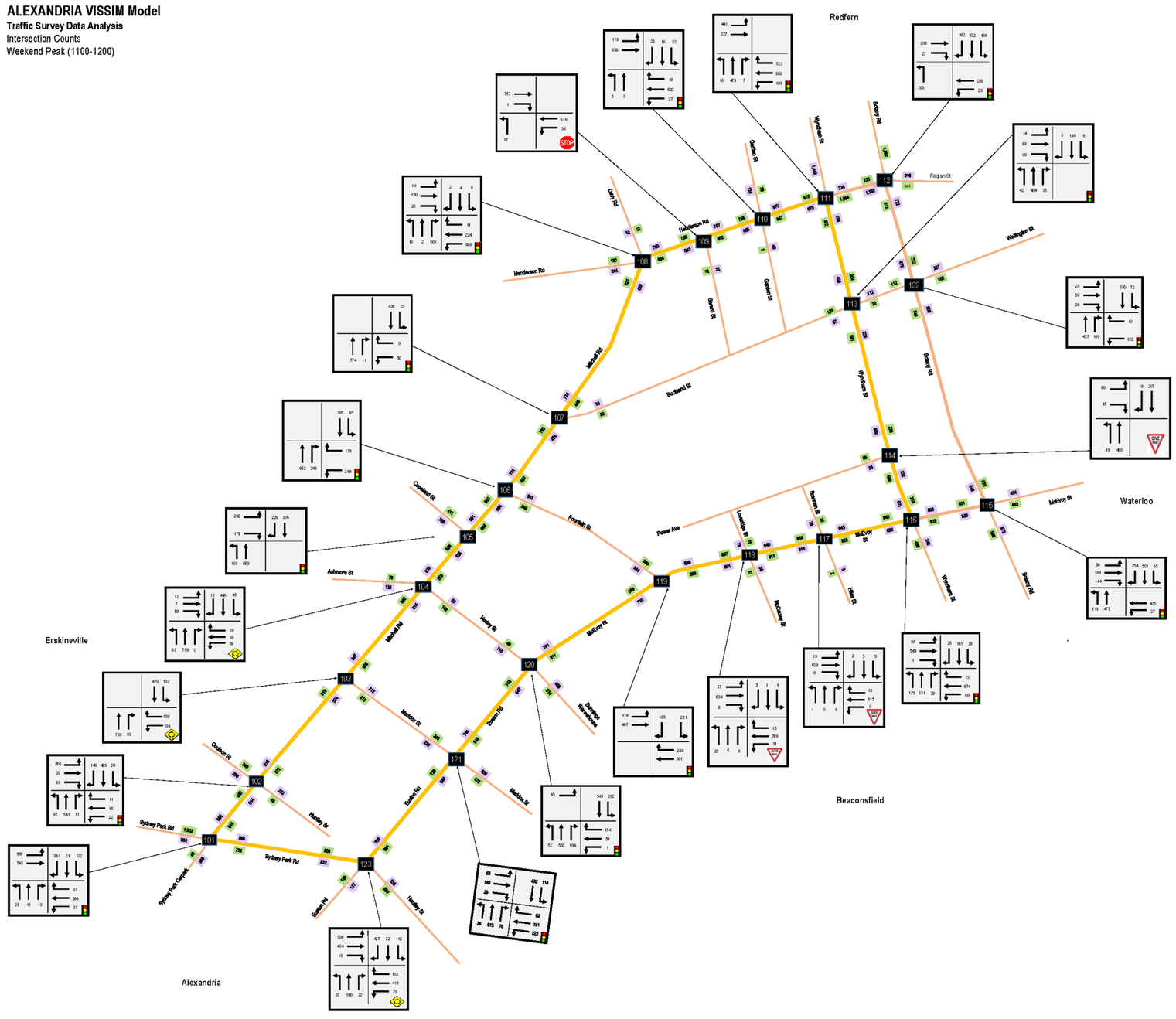


Figure 2.19: Weekend Midday Peak Turning Movement Counts Summary

2.9.8 Heavy Vehicle Movements and Freight

Heavy Vehicle Routes

Parts of the study area have signposted restrictions for heavy vehicles weighing 3 Tonnes or more. These streets include Mitchell Road south of Copeland Street and north of Fountain Street between the hours of 7 PM and 6 AM. The restricted routes are shown in Figure 2.20.

Figure 2.20: Heavy Vehicles Restricted Routes

2.10 CRASH HISTORY

2.10.1 Historical Crash Data

Crash data within the study area between 1st of January, 2010, and 30th of June, 2015, was provided by RMS. In the five-and-a-half-year period ending June 2015, a total of 364 crashes occurred within the study area, of which two (2) crashes resulted in a fatality and 166 crashes resulted in injuries. The remaining 196 crashes were non-casualty (damage only). There was also a motorcyclist fatality that occurred at the intersection of Euston Road and Maddox Street in August 2016.

On average, 69 crashes occurred per annum (2010-2014 full year data considered only), with the lowest number recorded in 2013 with 58 crashes and the highest number recorded in 2011 with 95 crashes as shown in

Figure 2.21 below. It should be noted that 2015 data is only taken to the 30th of June and as such is incomplete.

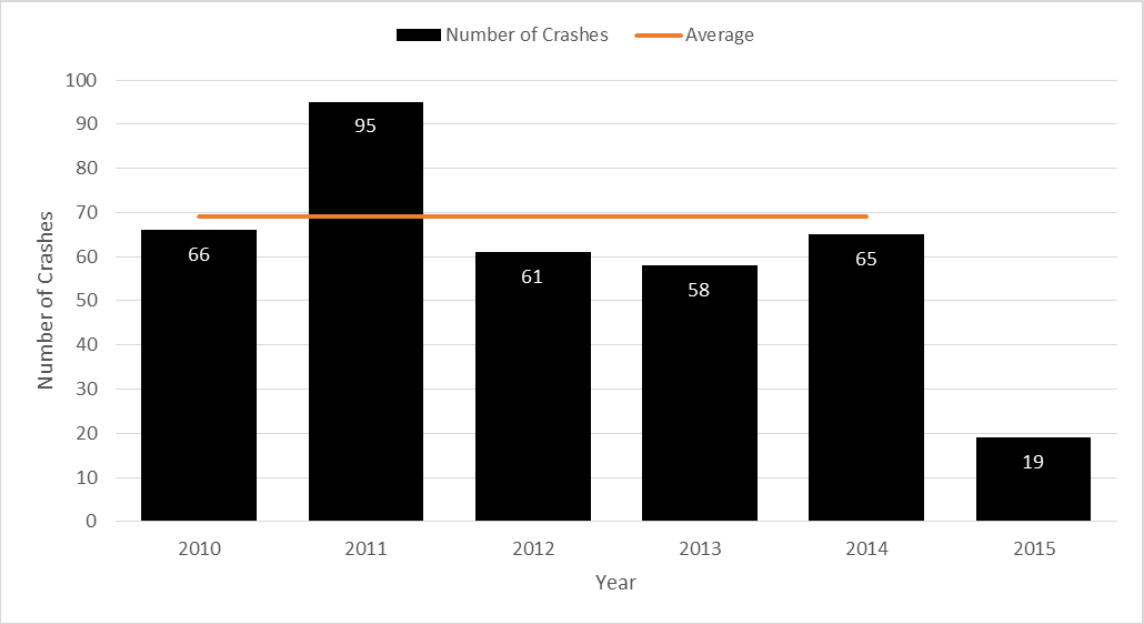


Figure 2.21: Number of Crashes per Annum

Crash locations with crash severity is shown in Figure 2.22. Figure 2.23 shows crash type by RUM code.

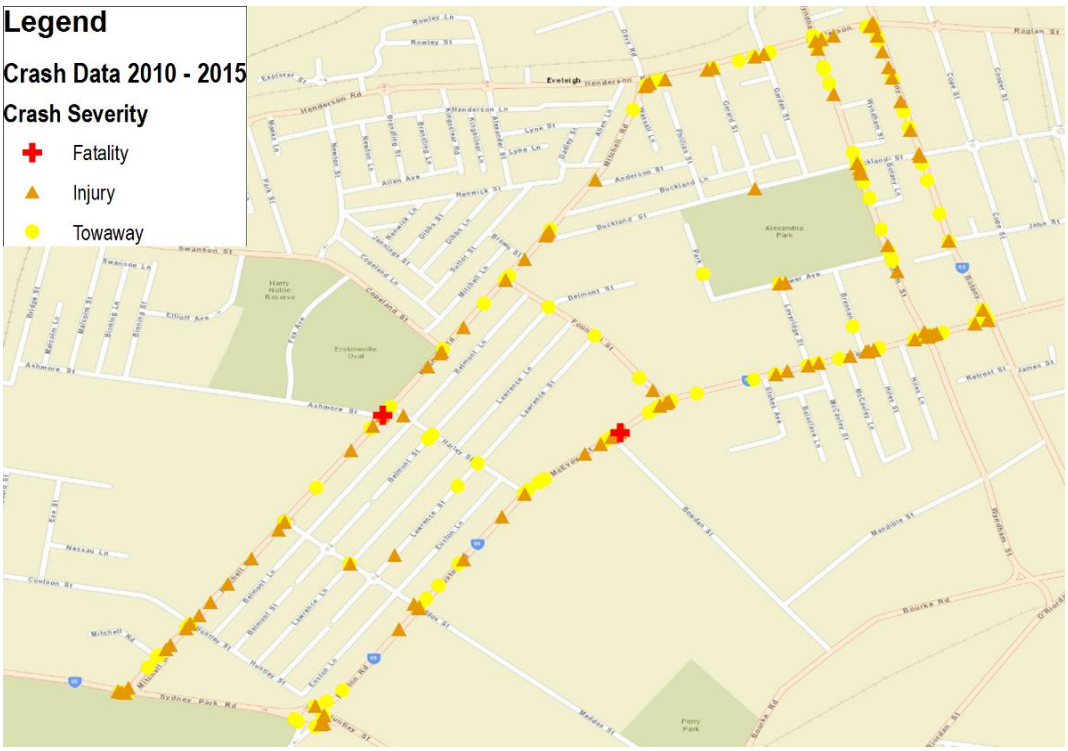


Figure 2.22: Crash Severity

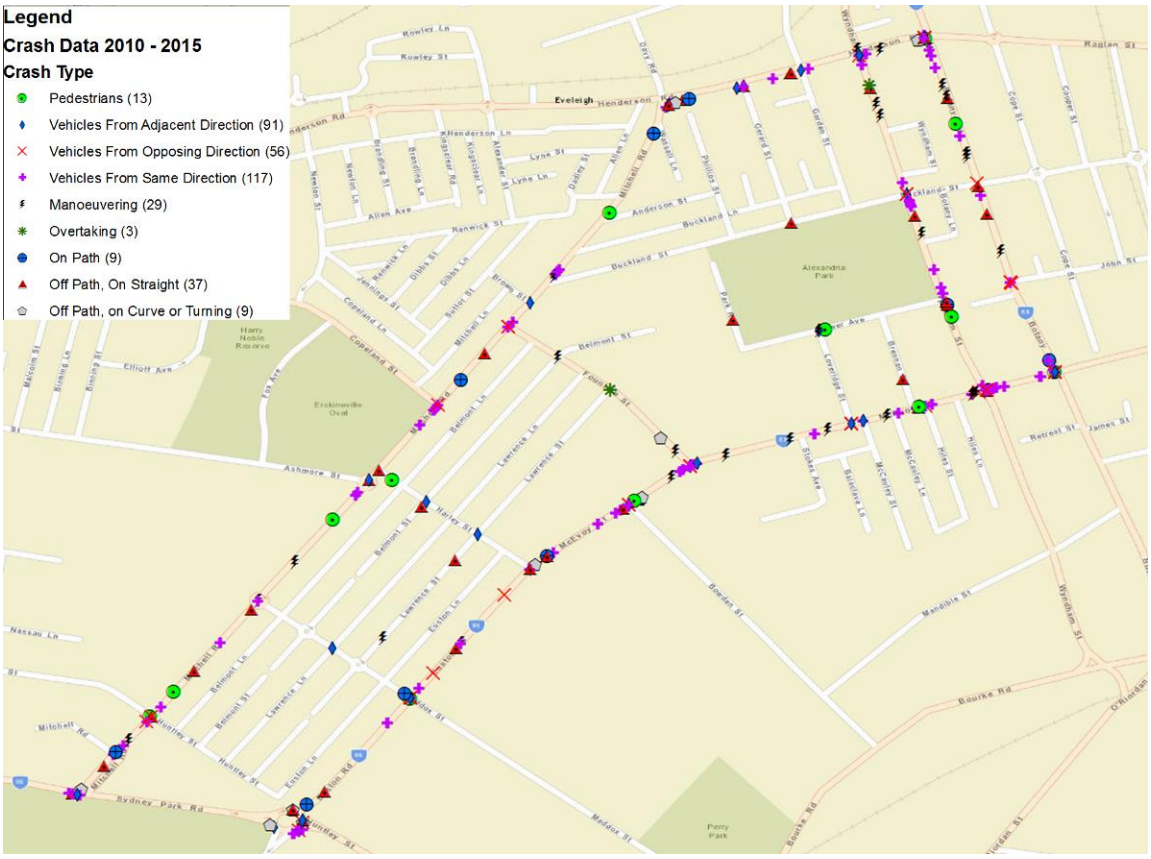


Figure 2.23: Crash Type

Table 2.5 below summarises the crashes by severity.

Table 2.5: Crash Summary (Severity)

Crash Severity	No of Crashes	%	No of Casualties
Fatal	2	0.5%	2
Injury	166	45.5%	187
Damage Only	196	54%	-
Total	364	100%	189

Crashes within the study area occur predominantly on the main roads, namely Mitchell Road, Henderson Road, Wyndham Street, Botany Road and McEvoy Street/Euston Road.

A total of 527 vehicles/pedestrians were involved in these crashes. Trucks were involved in 102 (19%) crashes, buses were involved in 9 (2%) and pedestrians were involved in 15 (3%) crashes.

A breakdown of different crash types that occurred in the study area is summarised in Table 2.6. Around a third of the total crashes (32%) occurred when vehicles collided travelling in the same direction. A quarter of the total crashes (25%) occurred when vehicles collided from adjacent directions whilst 15% of crashes involved vehicles travelling in opposing directions.

Table 2.6: Crash Type Summary

Crash Type	No of Crashes	%
Vehicles from Same Direction	117	32%
Vehicles from Adjacent Direction	91	25%
Vehicles from Opposing Direction	56	15%
Off Path On Straight	37	10%
Manoeuvring	29	8%
Pedestrians	13	4%
Off Path, On Curve or Turning	9	2.5%
On Path	9	2.5%
Overtaking	3	1%
Total	**364**	**100%**

2.11 PARKING

On street parking is available along various streets within the study area. In the AM peak, no on-street parking is allowed on the Euston Road / McEvoy Street eastbound carriageway (between 6 AM and 10 AM), due to Clearway restrictions. Similarly, in the PM peak, parking is restricted on the westbound carriageway (between 3 AM and 7 PM), due to Clearway restrictions. Figure 2.24 shows the locations of parking restrictions. It should be noted that No Parking, No Stopping and Clearway areas are not included within this map which only shows areas which restrict the duration of parking.

Figure 2.24: Existing Timed Parking Restrictions

2.12 EXISTING TRAFFIC MANAGEMENT

The existing traffic management scheme within the study area is essentially designed to restrict through vehicle access into local roads. A number of LATM devices are currently in place to ensure the vast majority of vehicles remain on the major road network. LATM items include:

- Turn Restrictions – a number of banned right turn movements exist from Mitchell Road, Henderson Road, Euston Road and McEvoy Street. Banning right turns reduces queueing and delays at intersections, reduces crash likelihood and reduces rat running;
- Chicanes – Chicanes are employed on Lawrence Street, Gerard Street, Garden Street and Buckland Street. Chicanes act as slow points for vehicles which reduce traffic speeds and reduces the likelihood of through accessing the street;
- Speed Humps – Speed humps are employed on Anderson Street, Gerard Street, Garden Street, Maddox Street, Mitchell Road, Huntley Street and Buckland Street. Speed humps act as slow points for vehicles which reduce the traffic speeds and reduce the likelihood of through traffic accessing the street; and
- No Through Roads – No through roads eliminate through traffic completely.

The locations of existing traffic management devices are shown in Figure 2.25 and Figure 2.26.

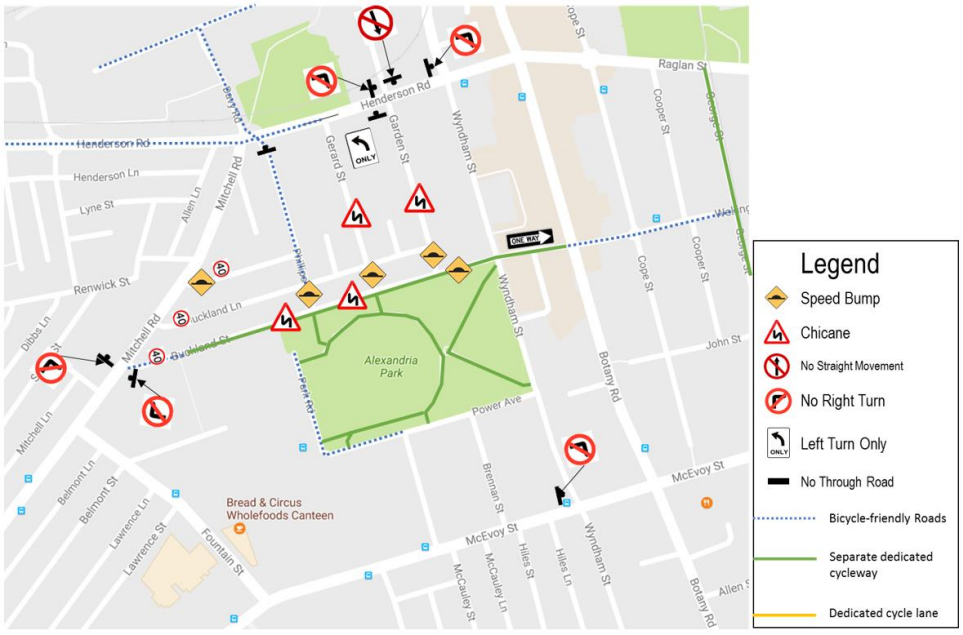


Figure 2.25: Existing Traffic Management Devices – Northern Section

Figure 2.26: Existing Traffic Management Devices – Southern Section

3. EXISTING CONDITIONS TRAFFIC MODEL

3.1 BASE MODEL CALIBRATION AND VALIDATION

3.1.1 Overview

The traffic modelling software VISSIM was used to create a microsimulation model for the study area. The model network is shown in Figure 3.1. The model was calibrated and validated in accordance with the RMS Traffic Modelling Guidelines, February 2013. The existing base case model represented:

- the AM peak period between 8.00 and 9.00 AM, with a 30 minute warm up and call down period on either side of the peak hour, capturing school zone between 8.00 and 9.30 AM;
- the PM peak period between 17:00 and 18:00 PM, with a 30 minute warm up and call down period on either side of the peak hour; and
- the weekend peak between 11:00 AM and 12:00 PM, with a 30 minute warm up and call down period on either side of the peak hour.

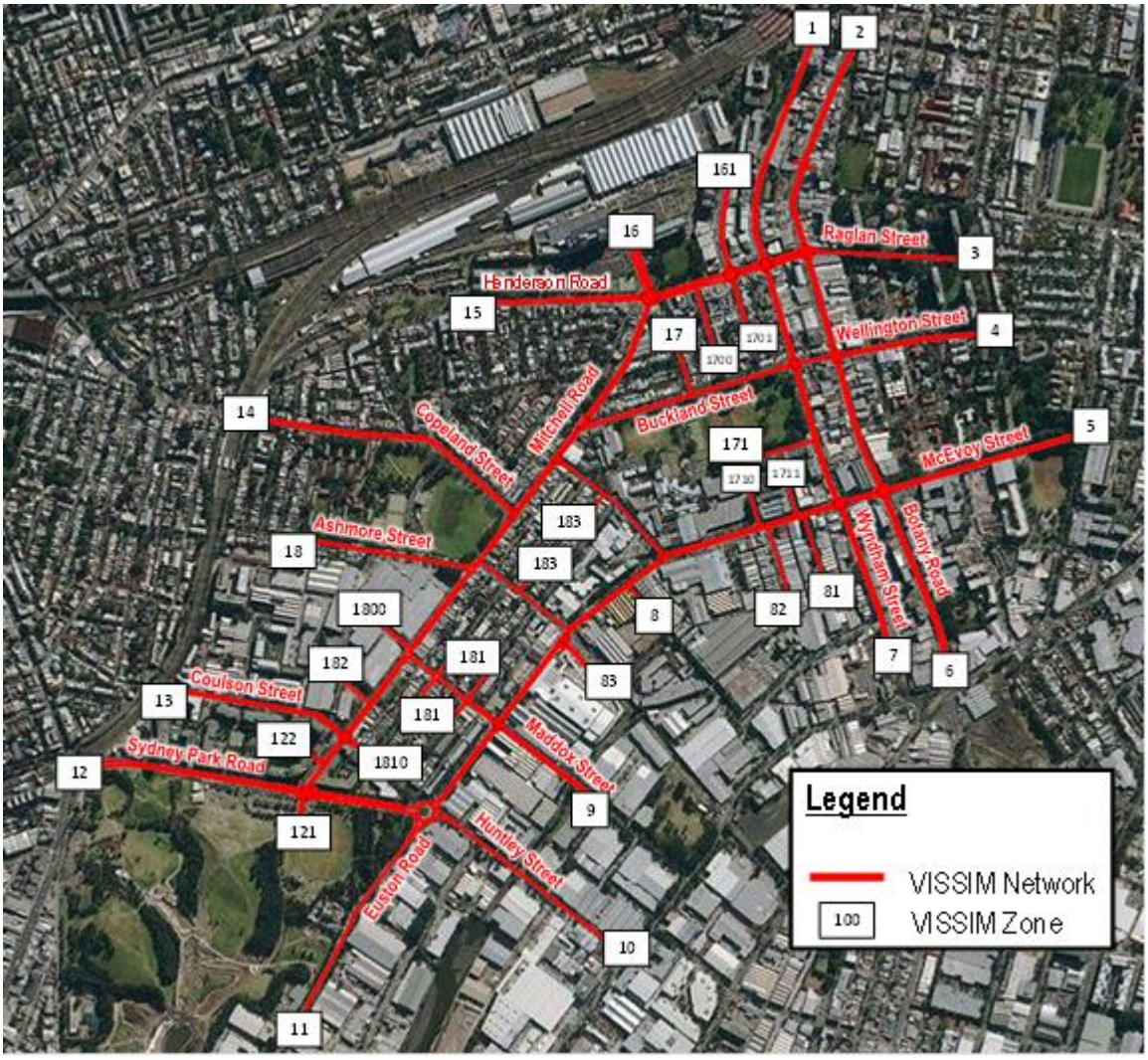


Figure 3.1: Existing Base Model Network

3.1.2 Input Data

A wide variety of data sets were used to build, calibrate and validate the models. These included:

- intersection turn counts by vehicles class;
- tube counts;
- travel time surveys;
- SCATS Intersection Diagnostic Monitor (IDM) signal data;
- aerial photography; and
- site observations.

3.1.3 Base Model Coding

The VISSIM model was coded using knowledge obtained from site visits and road layouts based on Google Maps and other mapping programs. Model parameters were left as the VISSIM defaults. Some of the key features of the model coding that should be noted are:

- movements within intersections and approaching zebra crossings are controlled by "Priority Rules" to ensure appropriate give-way behaviours;
- all zebra crossings are included in the model;
- vehicle inputs, releasing all vehicles into the model, are consistent with the posted speed along the relevant roads; and
- reduced speed areas have been included in to more accurately reflect driver behaviour when approaching stop lines and completing some manoeuvres.

3.1.4 VISSIM Model Calibration and Validation

The 2016 VISSIM model was calibrated and validated as per the RMS guidelines. Model calibration and validation results are documented in **Appendix A**. The base year 2016 VISSIM models have been calibrated and validated adequately and are fit for the study purpose.

4. EXISTING NETWORK PERFORMANCE

4.1 INTERSECTION LEVEL OF SERVICE

The intersection Levels of Service (LoS) have been assessed based on average delay in accordance with the RMS guideline (Guide to Traffic Generating Developments, Issue 2.2, RMS, October 2002). The LoS thresholds are summarised in Table 4.1.

Table 4.1: Intersection Level of Service Criteria

Level of Service (LoS)	Average Delay per vehicle (sec/veh)	Description
A	≤14	Good Operation
B	15 to 28	Good with acceptable delays and spare capacity
C	29 to 42	Satisfactory
D	43 to 56	Operating near capacity
E	57 to 70	At capacity
F	70 and above	Unsatisfactory

The guideline recommends that for priority intersections, such as roundabouts and sign-controlled intersections, the LoS value is determined by the critical movement with the longest delay, whereas for a signalised intersection the level of service criteria is based on the average intersection delay.

4.2 INTERSECTION PERFORMANCE

4.2.1 LoS and Delay

The AM, PM and Weekend peak performance of each intersection within the study area is summarised in Table 4.2.

In all periods traffic experiences substantial delays at the Botany Road / McEvoy Street and Henderson Road / Botany Road intersections. Queues of slow moving vehicles are observed along Euston Road / McEvoy Street, Wyndham Street and Henderson Road. The closely spaced signalised intersections and heavy volumes of conflicting traffic movements generate most of this congestion.

A complete list of movements operating at an LoS of E or F can be found in **Appendix B.**

Table 4.2: Intersection Level of Service – 2017 AM, PM and Weekend Peaks

Intersection	Intersection Control	LOS - AM (delay in seconds)	LOS – PM (delay in seconds)	LOS – Weekend (delay in seconds)
Sydney Park Road / Mitchell Road		B (21)	B (20)	B (24)
Mitchell Road / Huntley Street/ Coulson Street		A (14)	A (11)	B (21)
Mitchell Road / Maddox Street		A (8)	A (5)	A (12)
Mitchell Road / Harley Street/ Ashmore Street		A (4)	A (4)	B (18)
Mitchell Road / Copeland Street		B (21)	B (19)	C (39)
Mitchell Road / Fountain Street		B (17)	B (18)	C (36)
Mitchell Road / Buckland Street		A (8)	A (13)	B (17)
Mitchell Road / Henderson Road / Davy Street		C (34)	C (33)	C (39)
Henderson Road / Gerard Street		A (1)	A (1)	A (5)
Henderson Road / Garden Street		A (12)	A (12)	B (16)
Henderson Road / Wyndham Street		B (24)	A (11)	B (24)
Henderson Road / Botany Road		C (35)	D (50)	C (37)
Wyndham Street / Buckland Street		B (22)	D (45)	A (7)
Wyndham Street / Power Avenue		A (2)	B (23)	A (1)
Botany Road / McEvoy Street		C (36)	D (54)	C (40)
Wyndham Street / McEvoy Street		B (22)	B (26)	B (22)
McEvoy Street / Brennan Street / Hiles Street		A (2)	A (1)	A (1)
McEvoy Street / Loveridge Street / McCauley Street		A (1)	A (1)	A (2)
McEvoy Street / Fountain Street		B (22)	B (16)	B (22)
McEvoy Street / Harley Street / Euston Road / Bunnings Access		A (10)	A (13)	B (20)
Euston Road / Maddox Street		B (25)	B (20)	B (18)
Euston Road / Sydney Park Road / Huntley Street		B (19)	A (14)	A (6)

5. LOCAL AREA TRAFFIC MANAGEMENT SCHEME PROPOSAL

5.1 METHODOLOGY

A number of local area traffic management measures have been developed in consultation with CoS. With the future interchange at St Peters likely to increase traffic volumes within the study area, the purpose of these measures is to deter through traffic from using local streets.

The proposed measures range between the introduction of slow points and the closure of some local roads. With some exceptions, the options proposed are "low-cost" traffic management measures.

5.2 PROPOSED OPTIONS

5.2.1 Traffic Management Measures

This section lists the proposed traffic management options for this study area. In consultation with CoS the following traffic management options have been developed:

1. closing Anderson Street at Mitchell Road;
2. a flat top road hump at the entry to Renwick Street from Mitchell Road;
3. a reduced width slow point access to Buckland Lane from Mitchell Road;
4. a reduced width slow point access to Belmont Street south from Fountain Street;
5. a pedestrian refuge to the east of Belmont Street on Fountain Street;
6. a reduced width slow point access to Lawrence Street south from Fountain Street;
7. installation of traffic signals to control the Mitchell Road / Maddox Street intersection. This measure is proposed as part of the Ashmore precinct development;
8. closing Brennan Street and Loveridge Street at McEvoy Street;
9. closing Lawrence Street at its midpoint between Harley Street and Maddox Street;
10. closing Harley Street at Mitchell Road and at McEvoy Street; and
11. closing Maddox Street at Euston Road.

Measures 1, 5, 8, 9, 10 and 11 may require the removal of some on-street parking.

The measures are shows graphically in Figure 5.1. Details of each proposed measure are provided in **Appendix C** while measures included in each of the five options are shown in **Appendix D.**

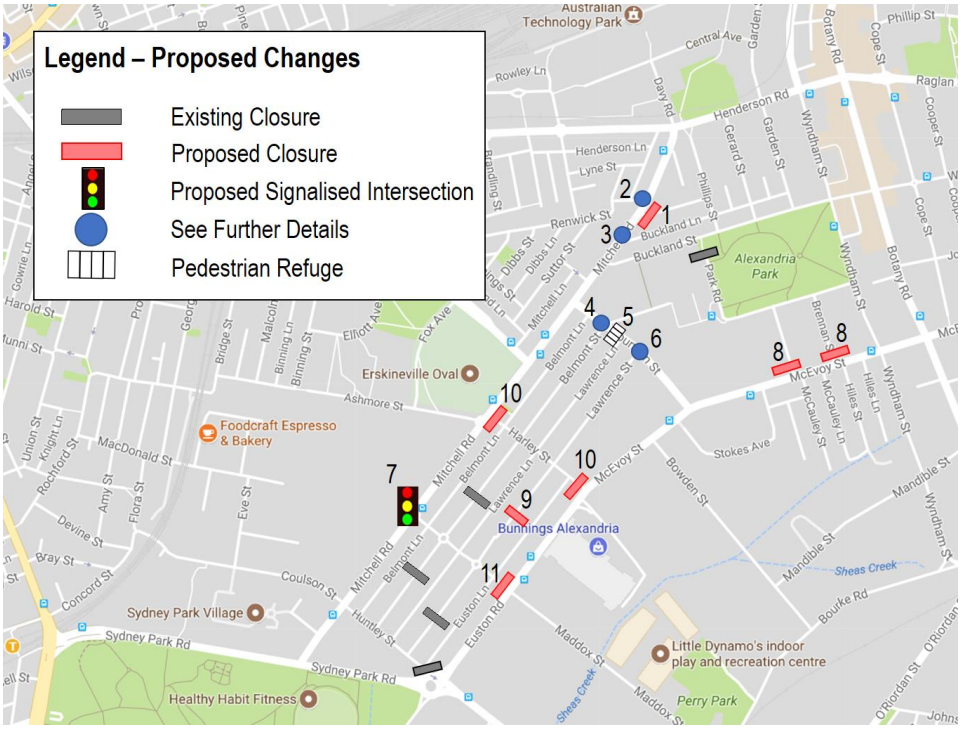


Figure 5.1: Proposed LATM Measures

5.2.2 Option Development

As part of this assessment, the proposed traffic management measures listed in the previous section were combined to develop five traffic management options. The traffic performance of these options was assessed using the existing conditions VISSIM model for the study area. Detailed analysis of these options is provided in **Section 8.**

Option 1

Option 1 includes traffic management measures 1 to 7 plus the following:

- closing Lawrence Street at its midpoint between Harley Street and Maddox Street;
- closing Harley Street at Mitchell Road and at McEvoy Street

The proposed measures are shown graphically in Figure 5.2.

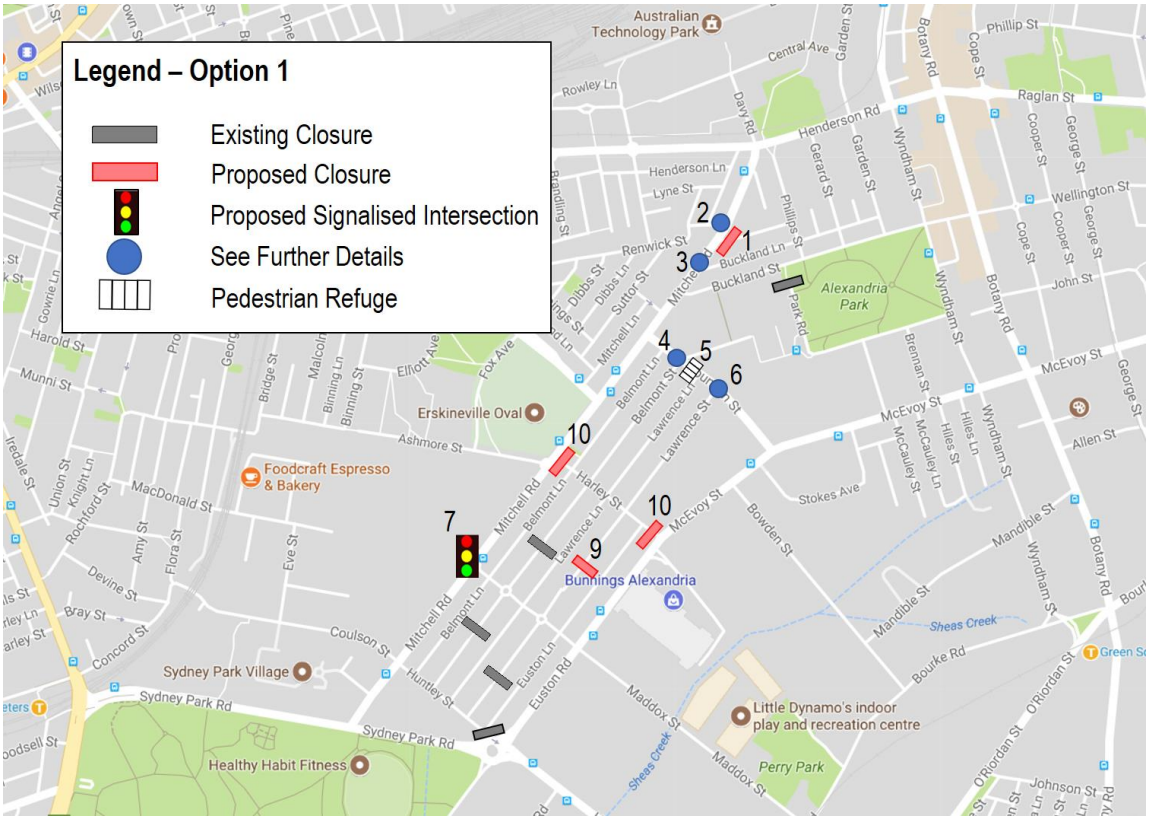


Figure 5.2: Proposed LATM Measures - Option 1

Option 2

Option 2 includes traffic management measures 1 to 7 plus the following:

- closing Maddox Street at Euston Road.

The proposed measures are shown graphically in Figure 5.3.

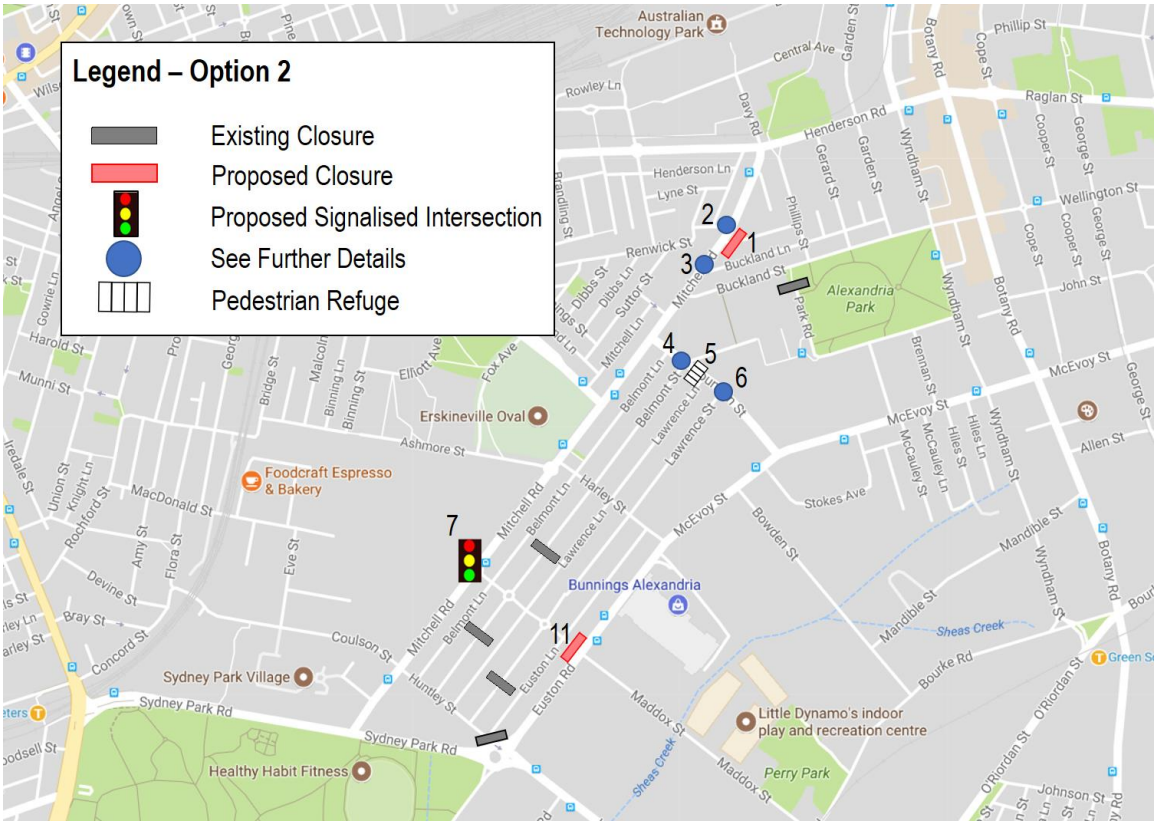


Figure 5.3: Proposed LATM Measures - Option 2

Option 3

Option 3 includes traffic management measures 1 to 7 in the northern section of the study area (section 5.2.1) plus a combination of Option1 and Option 2 as shown in Figure 5.4.

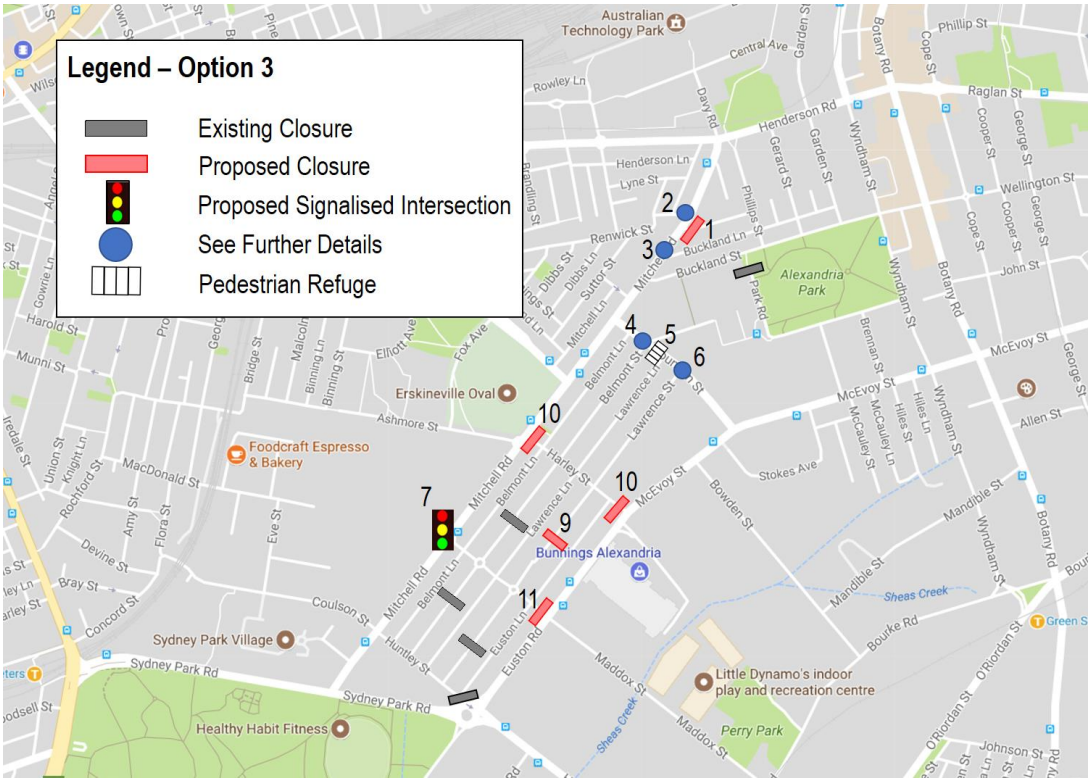


Figure 5.4: Proposed LATM Measures - Option 3

Option 4

Option 4 includes all the traffic management measures in the northern section of the study area (number 1 to 8 in section 5.2.1 and also in Figure 5.1). Option 4 is shown in Figure 5.5.

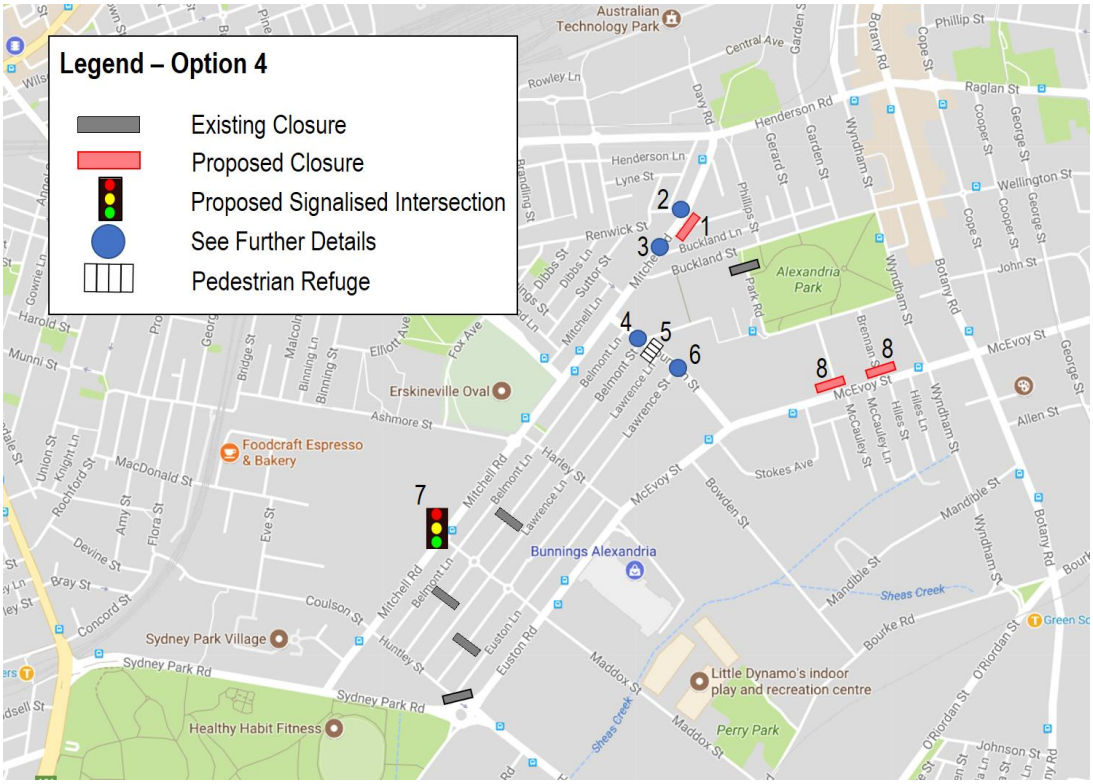


Figure 5.5: Proposed LATM Measures – Option 4

Option 5

Option 5 is a combination of Option 3 and Option 4, and includes all proposed traffic management measures. Option 5 is shown in Figure 5.6.

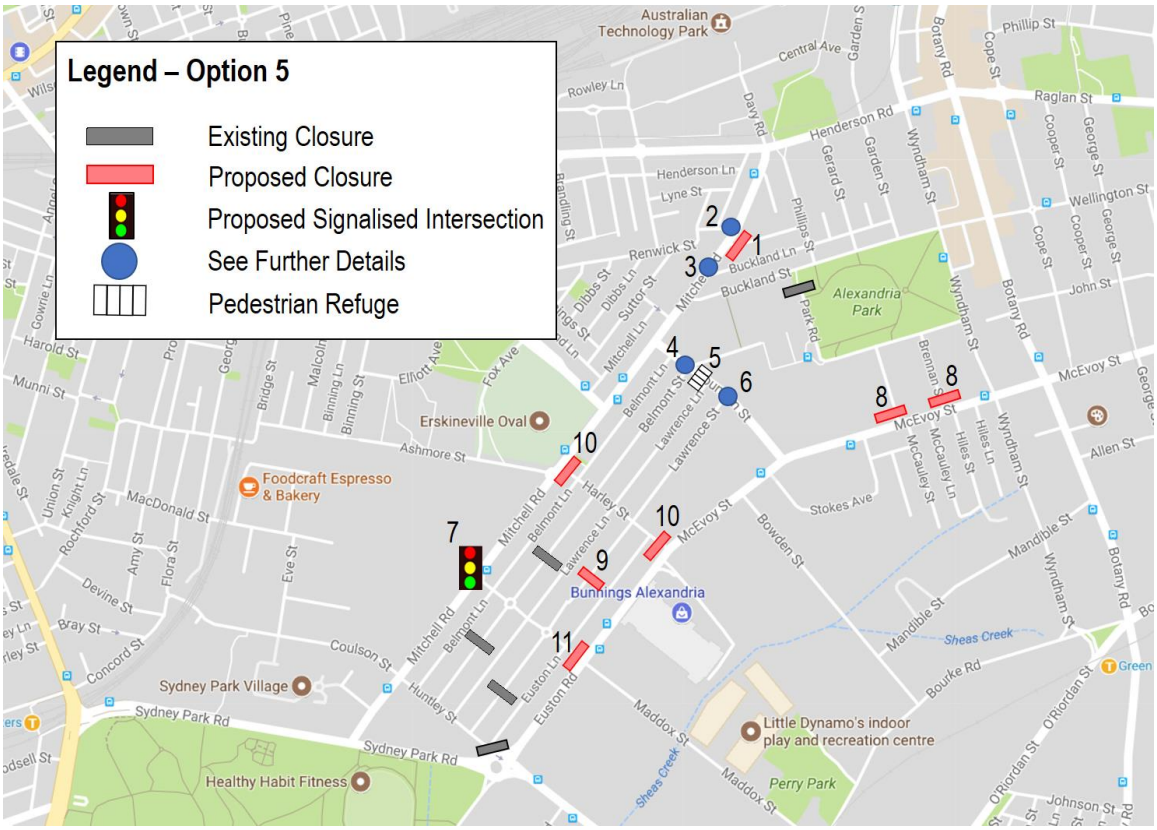


Figure 5.6: Proposed LATM Measures – Option 5

6. FUTURE DEVELOPMENTS AND ROAD IMPROVEMENTS

6.1 OVERVIEW

A number of road infrastructure improvement projects are either currently under construction or are in the planning stages, within or around the study area. These projects, including WestConnex, have the potential to significantly alter traffic patterns and volumes within the study area. Six key projects have been identified and described below.

6.2 WESTCONNEX

WestConnex is a three-stage project which includes connecting the M4 Motorway, which currently ends at North Strathfield, and the M5 Motorway, which currently ends at Mascot. The three stages are:

- **Stage 1:** Parramatta to City West Link;
  - M4 widening from Church Street to Homebush Bay Drive (7.5 km);
  - M4 East to City West Link connection (6 km including 5km tunnel);
- **Stage 2:** Beverley Hills to St Peters;
  - M5 East duplication from King Georges Road to St Peters Interchange (11 km including 6 km tunnel);
  - Airport Link from St Peters Interchange to Airport Drive; and
- **Stage 3:** City West Link to St Peters Interchange (8.5 km tunnel).

Stage 1 and Stage 2 of the project are currently under construction, with estimated completion dates of 2019 and 2020 respectively. Stage 3 is being planned with construction proposed to be undertaken from 2019 to 2023. The WestConnex stages are shown in Figure 6.1.

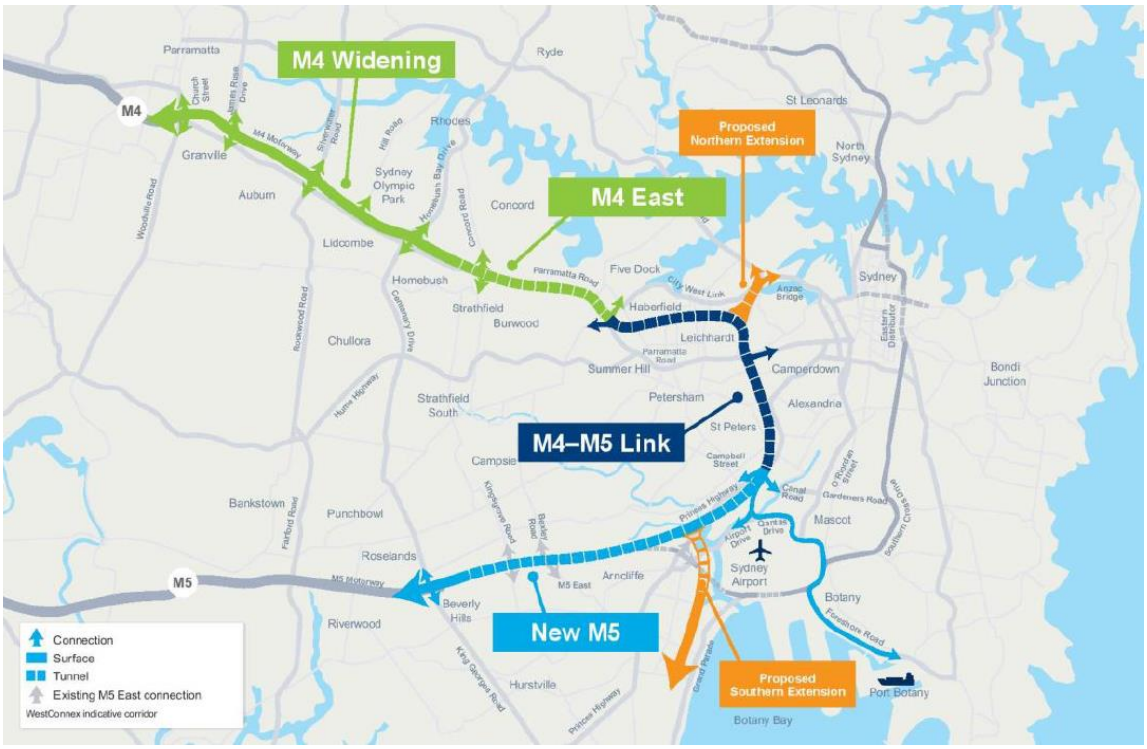


Figure 6.1: WestConnex Stages of Construction

Between Stage 2 and Stage 3, all traffic on the new M5 Motorway re-enters the local road network via the St Peters Interchange. The St Peters interchange will be located between the Princes Highway, Campbell Road, Burrows Road and Canal Road, St Peters. Connections will be established to the Euston Road / Campbell Road intersection and Gardeners Road, via a new bridge and connection across Alexandra Canal.

It is proposed to provide additional traffic lanes on Euston Road (generally three in each direction plus localised turning lanes) between its intersection with Campbell Street in the south and Maddox Street in the north. The proposed layout of the St Peters Interchange is shown in Figure 6.2.

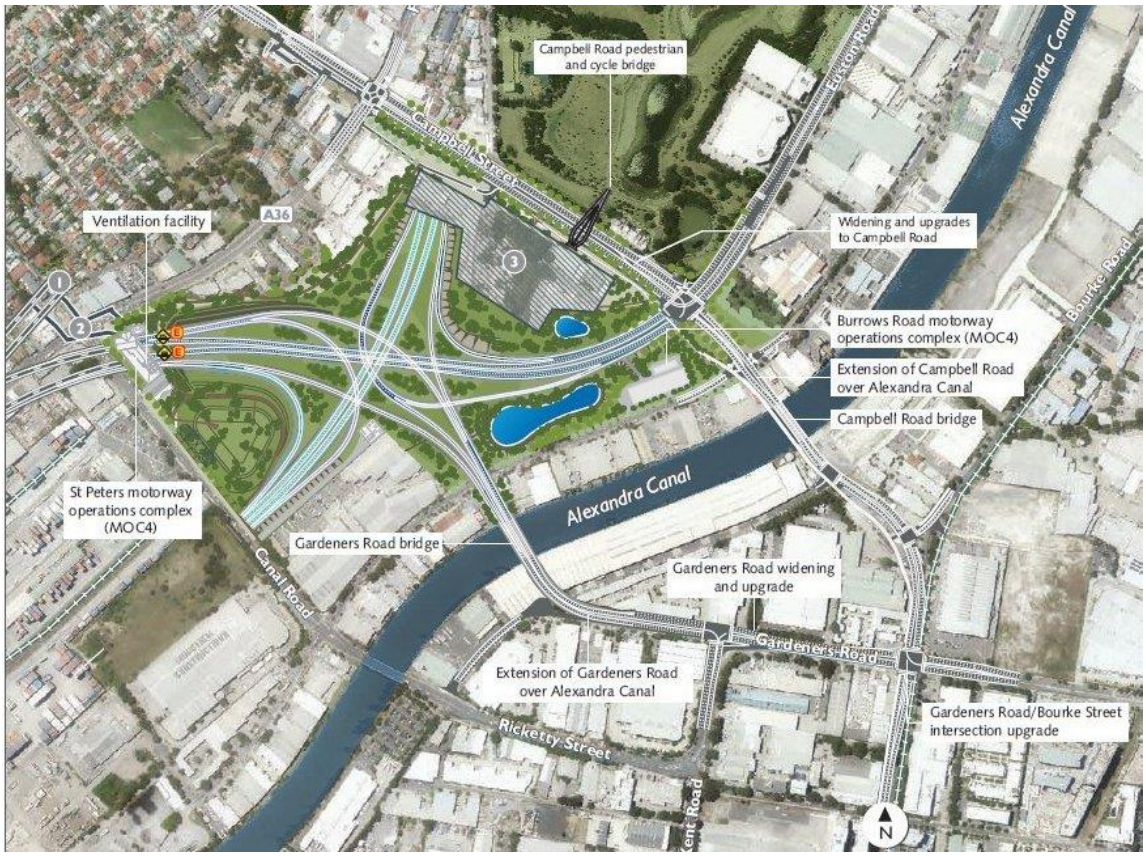


Figure 6.2: St Peters Interchange

CoS hold concerns regarding the impact that WestConnex, and traffic changes associated with the New M5 and St Peters Interchange will have on the local road network in Alexandria and surrounding areas.

SGS Economics and Planning, in a report assessing the local traffic and transport impacts on behalf of CoS, found that as a result of WestConnex, the LoS of intersections surrounding the St Peters Interchange is likely to be worsened significantly, with Euston Road and McEvoy Street the most heavily impacted roads within the study area. LoS is also expected to be impacted on Mitchell Road, Fountain Street, Henderson Road, Wyndham Street and Botany Road.

6.3 ASHMORE PRECINCT DEVELOPMENT

The Ashmore Precinct is an industrial area flagged for urban renewal in Sydney's inner suburbs, with up to 13.5 hectares of redevelopment potential. The redevelopment is proposed to provide approximately 3,500 residential dwellings and over 200,000 square metres of gross floor area for commercial and retail opportunities. The site is located in Erskineville adjacent to Alexandria, bounded by Ashmore Street, Coulson Street, Mitchell Road and the Bankstown rail line. The redevelopment site is shown in Figure 6.3.

Figure 6.3: Ashmore Precinct Site

A Traffic and Parking Assessment, conducted by AECOM in February 2013, found that the site is estimated to produce an additional 1,000 vehicle trips in the 2027 peak hour. Alterations to the existing network are recommended by the report, regardless of the status of the Ashmore Precinct redevelopment. The following improvements are recommended in response to the future traffic generation of the Ashmore site:

- traffic signals at the intersection of Mitchell Road and Maddox Street;
- revised configuration at the intersection of Mitchell Road and Sydney Park Road;
- parking restrictions on Mitchell Road between Copeland Street and Fountain Street, and between Sydney Park Road and Coulson Street;
- alteration of signal phasing at the intersection of Mitchell, Coulson Street and Huntley Street;
- baning of right turn movements from Harley Street to Mitchell Road;
- a residents parking scheme on surrounding streets such as Lawrence Street, Mitchell Road, Belmont Street, Maddox Street, Hartley Street, Huntley Street, Bridge Street, Malcolm Street, Binning Street and Ashmore Street. A possible expansion of this area is suggested as the development stages progress;
- modification of bus route 370 and bus route 355 to travel via the Mitchell Road / Maddox Street intersection;
- increased service frequency of bus route 308; and
- expansion of bus route operation hours to 10:00 PM on weekdays for routes within the vicinity of the redevelopment site.

6.4 GREEN SQUARE TOWN CENTRE DEVELOPMENT

The Green Square Town Centre, and surrounding area, is undergoing urban renewal as part of City of Sydney's *Sustainable Sydney 2030 Vision*. The site is predominantly within the suburb of Zetland and covers approximately 14 hectares, including local and state-owned sites such as the former Royal South Sydney Hospital and the former NSW Police Service Centre. It is proposed that the Green Square Town Centre will accommodate approximately 6,750 residents, 7,600 employees, 14,000 square metres of public open space and 5,000 square metres of community facilities. The location of the Green Square Town Centre Development is shown in Figure 6.4.

Figure 6.4: Green Square Town Centre Site

A Traffic and Parking Assessment, conducted by Bitzios Consulting in January 2013, found the redevelopment site is estimated to produce an additional 1,400 vehicle trips in the AM peak hour, 1,900 vehicle trips in the PM peak hour and 1,450 vehicle trips in the Saturday peak hour by 2025. The following improvements were recommended:

- upgrade of the Epsom Road / Botany Road intersection, including banning parking on the southern side of Epsom Road, sharing left turn lanes as a left turn and right turn lane and moving the pedestrian crossing to the southern approach of the intersection;
- construction of Geddes Avenue west link;
- traffic signals at the proposed Geddes Avenue / Botany Road intersection, including the ban of the right turn movement from Botany Road north to Geddes Avenue west;
- upgrade the Bourke Road / O'Riordan Street / Botany Road intersection;
- ban of the right turn from Hansard Street to Joynton Avenue;
- ban of peak period parking on approaches and departures on Epsom Road at Joynton Avenue to provide additional/extended approach lanes to the intersection;
- signalise Elizabeth Street / Joynton Avenue;
- a local area traffic management scheme which progresses as the development does, with traffic speed management devices implemented generally; and
- The closure of Hinchcliffe Street to traffic at its intersection with Geddes Avenue (with active transport connections retained).

6.5 ALEXANDRIA TO MOORE PARK IMPROVEMENTS

The Alexandria to Moore Park road corridor has been identified as a key traffic link by the NSW Government. This link this been identified for further investigation to improve connectivity and reduce travel times and to support urban renewal on its southern fringe. The corridor is a major connection between the eastern suburbs and the southern Inner West suburbs and industrial areas of south Sydney, including Euston Road, McEvoy Street, Bourke Street and Lachlan Street. The route is shown in Figure 6.5.

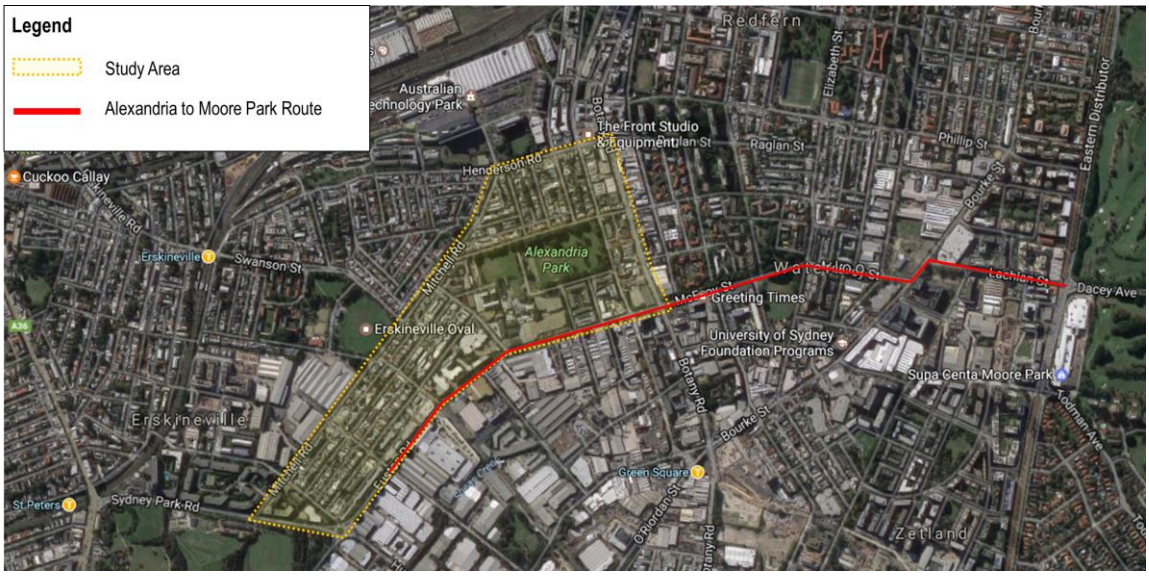


Figure 6.5: Alexandria to Moore Park Route

The RMS has identified the following improvements on the Alexandria to Moore Park route:

- clearways in both directions during AM and PM peak periods between Maddox Street and Young Street on Euston Road and McEvoy Street;
- improving intersections along Euston Road and McEvoy Street;
- modification of the intersection of Euston Road / Maddox Street in line with WestConnex New M5 works;
- re-alignment of the Bourke Street intersections with Lachlan Street and with McEvoy Street to form one intersection;
- widening Lachlan Street from two lanes to four lanes;
- Lachlan Street / South Dowling Street intersection upgrade including widening of South Dowling Street north of Lachlan Street for southbound motorists; and
- altering the right turn arrangements at the Dacey Avenue / Anzac Parade / Alison Parade intersection to improve the efficiency for all transport modes.

6.6 KING STREET GATEWAY PROJECT

The King Street Gateway project, currently being developed by Roads and Maritime Services, will look to take advantage of the WestConnex traffic changes by reducing vehicular capacity on the Princes Highway, north of Campbell Street, and Sydney Park Road, between Princes Highway and Mitchell Road, to enhance local amenity and improve connectivity with Sydney Park.

6.7 EAST-WEST RELIEF ROAD

The CoS is proposing a new road, linking Alexandria and Green Square, in an effort to reduce the congestion currently experienced on major roads and improve connectivity between Alexandria, Green Square and surrounding areas. The proposed road is 380 metres long connecting from a newly proposed Botany Road / Geddes Avenue (part of the Green Square Town Centre project) in the east to the Bourke Road / Bowden Street intersection in the west, crossing O'Riordan Street. The intersections with Botany Road and O'Riordan Street are proposed to be signalised. The East-West relief road is shown in Figure 6.6.

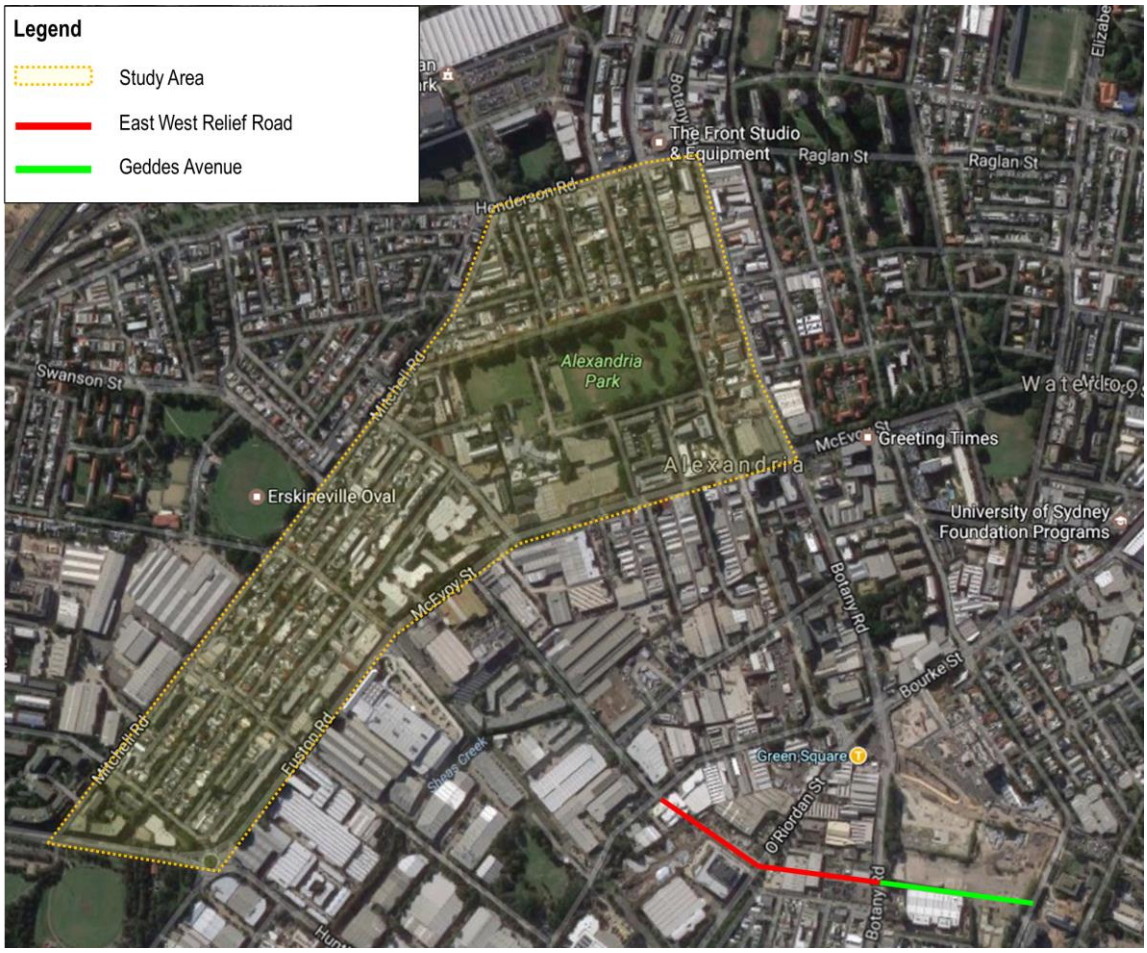


Figure 6.6: East West Relief Road

7. FUTURE TRAFFIC GENERATION

7.1 OVERVIEW

All the major developments and infrastructure improvements within and surrounding the study area are predicted to substantially increase traffic volumes within the study area's road network. The key generators of future additional traffic within the study area include:

- WestConnex;
- The Ashmore Precinct redevelopment; and
- The Green Square development.

7.2 WESTCONNEX – YEAR 2021 WITH NEW M5

WestConnex is expected to substantially increase traffic volumes within the study area, however limited information is publicly available on future forecast traffic volumes on the surface road network. Findings from a TTM study titled "WestConnex Stage 2 EIS, Review of Traffic, Transport and Modelling" (January 2016) was used to estimate forecast traffic volumes for this study. It is worth noting that the TTM study was based on limited information provided by the WestConnex Authority and was limited to "screen line" traffic flows north and south of the study area. Peak hour traffic volumes were only provided at the following locations:

- Euston Road south of Maddox Street; and
- Mitchell Road.

The 2021 'screen line' flows at the above locations are shown in Figure 7.1. Compared to the existing flows, Weekday AM and PM peak traffic volumes on Euston Road are forecast to increase significantly with an additional 1,220 vehicles / hr in the AM peak and additional 1,060 vehicles / hr in the PM peak are forecast.

As shown in Figure 7.1, traffic volumes on Mitchell Road, near its intersection with Sydney Park Road, are projected to increase slightly (160 vehicles / hr) in the 2021 AM peak. In the PM peak, traffic volumes are expected to remain stable, at close to existing volumes. The slight increase in the AM peak and no increase in the PM peak are attributed to the closure of the right turn movement from Mitchell Road to Sydney Park Road, and associated reduction in traffic capacity on Sydney Park Road. The TTM report does not provide traffic volumes on the northern section of Mitchell Road, in close proximity to its intersection with Henderson Road.

It is not clear what major developments within the study area were included (and at what detail) when modelling future traffic volumes for the WestConnex project.

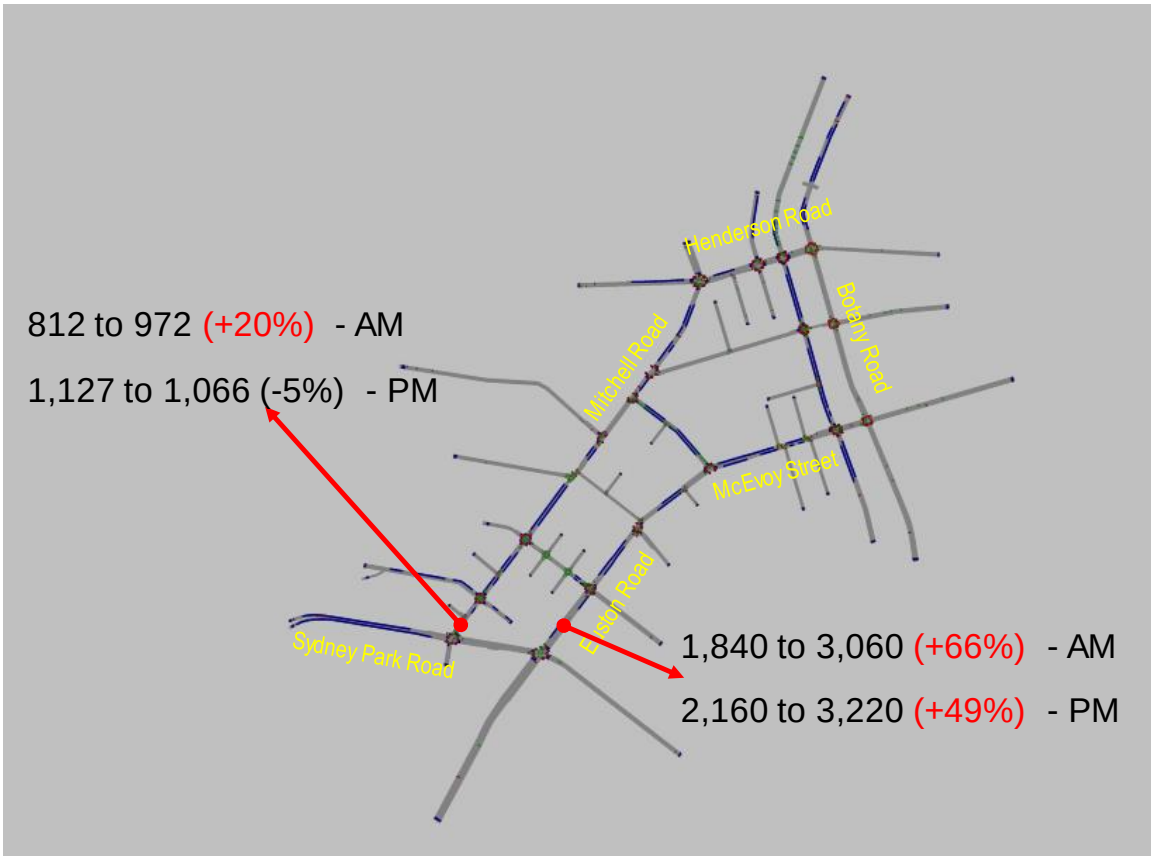


Figure 7.1: Estimated Increases in Two-Way Traffic Volumes (2017 to 2021)

7.3 ASHMORE PRECINCT – YEAR 2022

The AECOM report, 'Ashmore Precinct Traffic and Parking Assessment' (February 2013), was interrogated to determine the traffic generation and distribution for the proposed development. The development is proposed to provide approximately 3,500 residential dwellings and over 200,000 square metres of gross floor area for commercial and retail opportunities. The AECOM report forecasts that by 2022, 2,122 dwellings and 141,490 square meters of gross floor area are expected to be in place.

For the purpose of this assessment, traffic generation from this development was included in the future year assessment.

The traffic generation was calculated using a trip rate of 0.29 peak hour vehicle trips per dwelling. Traffic was spatially distributed to the wider network based on the Bureau of Transport Statistics, 2012 Journey to Work Data. The AECOM traffic distribution was rationalised for the study area.

7.4 GREEN SQUARE DEVELOPMENT

The AECOM report, 'Green Square Town Centre – Essential Infrastructure and Public Domain, 2031 Modelling Synopsis' (July 2014), summarises the 2031 traffic generation from the development. The following traffic generation assumptions were used:

- 0.19 trips per residential unit in the AM peak;
- 0.15 trips per residential unit in the AM peak;
- 3.53 trips per 100 square meters of Retail Gross Floor Area (GFA); and
- 0.55 trips per 100 square meters of Commercial Gross Floor Area (GFA).

Traffic generation from "site 1" (above Green Square Railway Station) was subsequently reduced to reflect the amount of car parking provided for this site.

By 2025, the Green Square development is predicted to generate 1,400 trips in the AM peak, 1,900 trips in the PM peak and 1,450 trips in the weekend peak. The AECOM report suggested between 15% and 19% of these trips would use Botany Road, within the study area, to access the development. This equates to between 225 and 300 trips. It is likely that these additional trips were included in the WestConnex traffic modelling and allowance for any additional trips in this assessment could result in "double counting". However, to account for any uncertainty, the inbound and outbound traffic flows between key O-D pairs on Botany Road were increased by 5%.

8. OPTION ASSESSMENT

8.1 OVERVIEW

A "Do Minimum" option was developed which included all key committed land use development within the study area.

The local area traffic management measures that were developed in consultation with Council were:

- **Option 1:** the closure of Harley Street to through traffic;
- **Option 2:** the closure of Maddox Street to through traffic;
- **Option 3:** the combination of Options 1 and 2 (i.e. the closure of Harley Street and Maddox Street);
- **Option 4:** the closure of Loveridge Street and Brennan Street to through traffic; and
- **Option 5:** combination of Options 3 and 4 (i.e. the closure of Harley Street, Maddox Street, Loveridge Street and Brennan Street).

The existing conditions VISSIM model for study area was used to assess the traffic performance of the "Do Minimum" option and the five proposed options.

8.2 DO MINIMUM (INCLUDING COMMITTED INFRASTRUCTURE UPGRADES)

8.2.1 Road Network

The "Do Minimum" option included:

- removal of parking to create four (4) travel lanes for Euston Road and McEvoy Street from Maddox Street for peak periods including weekends (Alexandria to Moore Park Corridor);
- widening to create six lanes for Euston Road just north of Sydney Park Road before reducing to five lanes just south of the intersection with Maddox Street;
- left in - left out for McEvoy Street / Bowden Street;
- intersection upgrades (including the addition of dedicated turning lanes) for:
  - Botany Road / McEvoy Street (Alexandria to Moore Park Corridor);
  - Wyndham Street / McEvoy Street (Alexandria to Moore Park Corridor);
  - McEvoy Street / Fountain Street (Alexandria to Moore Park Corridor);
  - Mitchell Road / Maddox Street / MacDonald Street (Ashmore Precinct Development); and
  - Euston Road / Maddox Street. Dedicated left turn lane from Euston Road south to Maddox Street west (WestConnex).
- traffic signals at Euston Road / Sydney Park Road / Huntley Street (WestConnex) and at Mitchell Road / Maddox Street (Ashmore Precinct);
- right turn bans as follows:
  - Sydney Park Road / Mitchell Road. Right turn from Mitchell Road to Sydney Park Road banned (WestConnex); and
  - Sydney Park Road / Euston Road. Right turn from Euston Road southbound to Sydney Park Road.
- peak period clearways for:
  - Mitchell Road between Sydney Park Road and Coulson Street / Huntley Street (AECOM Report); and
  - Mitchell Road between Copeland Street and Fountain Street (AECOM Report).

The Do Minimum option does not include clearway in Fountain Street. The proposed upgrades are shown in Figure 8.1.

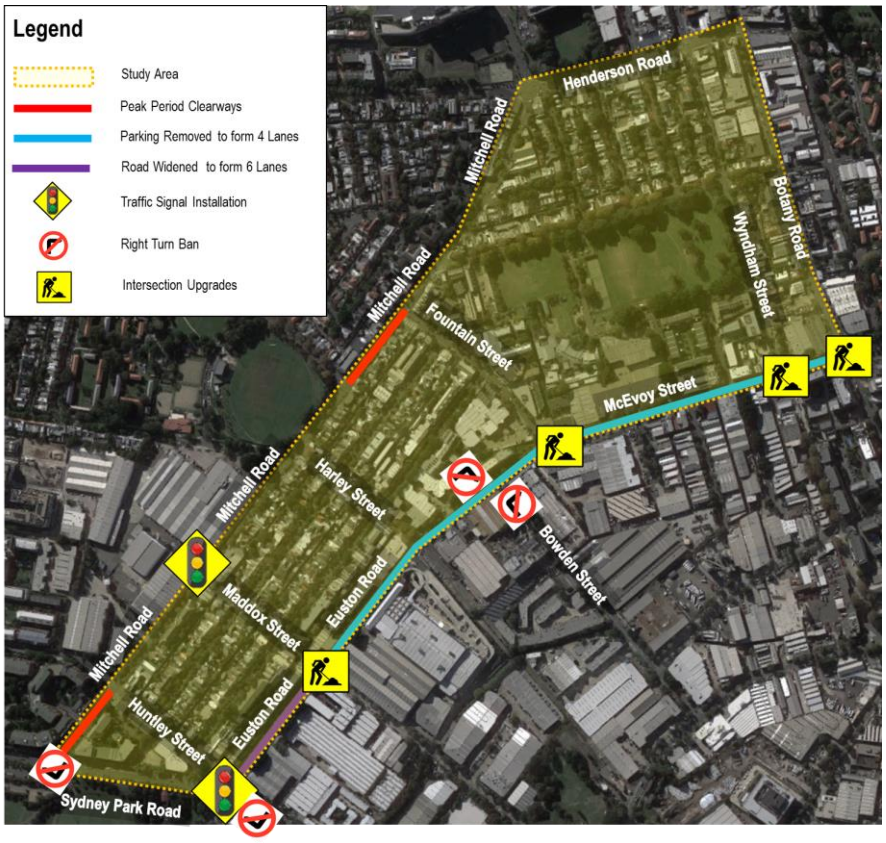


Figure 8.1: Proposed Road Network Upgrades

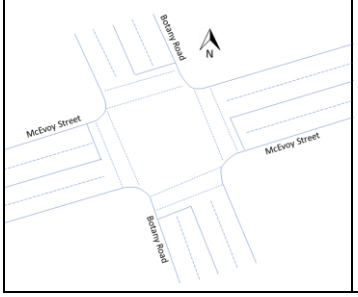
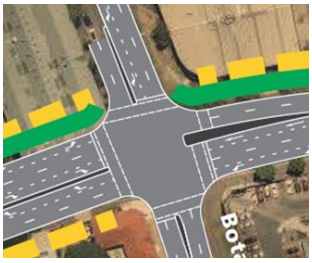
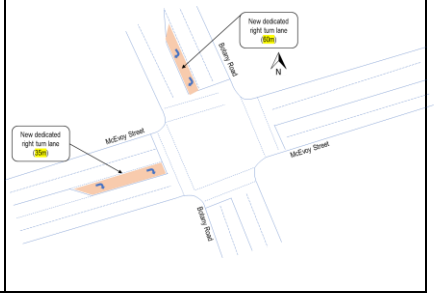
Botany Road / McEvoy Street Intersection

The Botany Road / McEvoy Street intersection configuration has two lanes on each approach allowing through movements. Left turn movements are allowed from the left hand lane on each approach, whilst right turn movements are banned from McEvoy Street east and Botany Road south. Right turn movements are currently allowed from the right hand lane on McEvoy Street west and Botany Road north, although these movements cause significant queueing and delays.

As part of the Alexandria to Moore Park Corridor Upgrades (A2MP), it is proposed that a dedicated right turn lane be constructed on McEvoy Street to reduce the queuing associated with the right turn movement which often queues back through the McEvoy Street / Wyndham Street intersection. The proposed layout includes a 60m dedicated right turn lane from the Botany Road north approach, and a 35m right turn lane from the McEvoy Street west approach.

The existing intersection layout, A2MP project proposed layout and concept of the proposed intersection layout adopted for this analysis are shown in Table 8.1.

Table 8.1: Existing and Proposed Intersection Layout – Botany Rd / McEvoy St

Existing Intersection Layout	A2MP Project	Proposed Intersection Layout
		

The geometrical differences between the A2MP intersection layout the layout proposed as part of this exercise are as follows:

- The A2MP layout proposes a dedicated left turn lane on the McEvoy Street (east). As part of this exercise, no improvements are proposed on this approach;
- The A2MP layout proposes a dedicated left turn lane on the McEvoy Street (west) while no dedicated left turn lanes are proposed;
- The A2MP layout proposes an 80m long dedicated right turn lane on the McEvoy Street (west). A dedicated right turn lane of approximately 35m long is proposed.

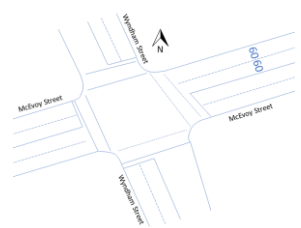
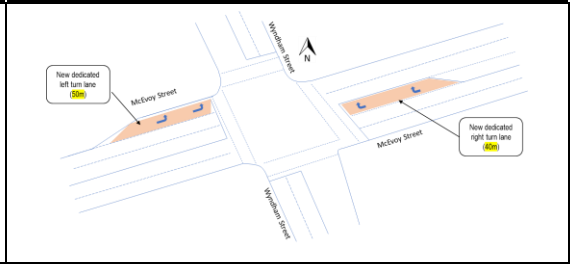
McEvoy Street / Wyndham Street Intersection

The McEvoy Street / Wyndham Street intersection configuration has two lanes on each approach. Left turn movements are allowed from the left hand lane on each approach, whilst right turn movements are banned from McEvoy Street west. Right turn movements are currently allowed from the right hand lane on all other approaches, although these movements cause significant queueing and delays.

As part of the Alexandria to Moore Park Corridor Upgrades, a 40m long dedicated right turn lane is proposed to be constructed on McEvoy Street east to assist in reducing queueing issues on this approach.

It is also proposed to introduce a dedicated 50m long left turn lane from McEvoy Street (west) to Wyndham Street. The existing intersection layout, A2MP project proposed layout and concept of the proposed intersection layout are shown in Table 8.2.

Table 8.2: Existing and Proposed Intersection Layout – McEvoy St / Wyndham St

Existing Intersection Layout	A2MP Project	Proposed Intersection Layout
		

The geometrical differences between the A2MP intersection layout the layout proposed as part of this exercise are as follows:

- The A2MP layout proposes 80-metre long turn bays for the right-turn movement from McEvoy Street (E), as well as the left-turn movement from McEvoy Street (W). In contrast, this exercise included a 40-metre long bay for the right-turn movement from McEvoy Street (E) and a 50-metre long bay for the left-turn movement from McEvoy Street (W).

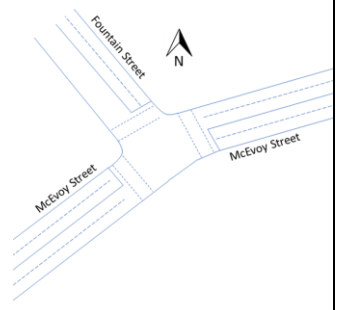
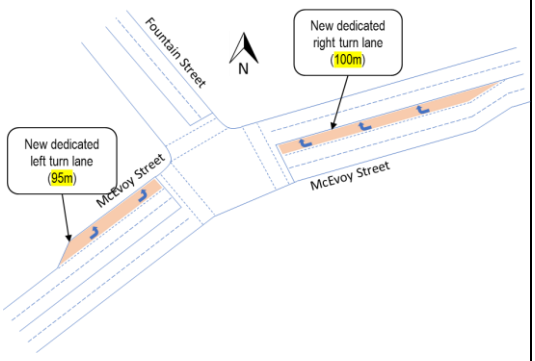
McEvoy Street / Fountain Street Intersection

The McEvoy Street / Fountain Street intersection configuration has two lanes on each approach on McEvoy Street, allowing through movements and a lane each for left and right turn movements from Fountain Street. Left hand lanes on each approach are shortened due to parked vehicles outside commuter peaks. Left turn movements from McEvoy Street west are made from the left hand lane, whilst right turn movements from McEvoy Street east are made from the shared right hand lane.

As part of the Alexandria to Moore Park Corridor Upgrades, a dedicated right turn lane is proposed to be constructed on McEvoy Street east and a dedicated left turn lane constructed on McEvoy Street west. Queueing associated with the right turn movement can impede through traffic. The proposed intersection layout includes a 100m dedicated right turn lane from the McEvoy Street east approach and a 95m long left turn lane on the McEvoy Street west approach.

The existing intersection layout, A2MP project proposed layout and concept of the proposed intersection layout are shown in Table 8.3.

Table 8.3: Existing and Proposed Intersection Layout – McEvoy St / Fountain St

Existing Intersection Layout	A2MP Project	Proposed Intersection Layout
		

The layouts proposed for the A2MP Project and this exercise are identical for the intersection of McEvoy and Fountain Streets.

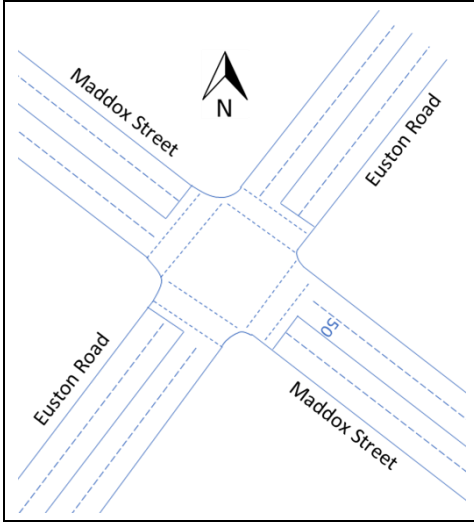
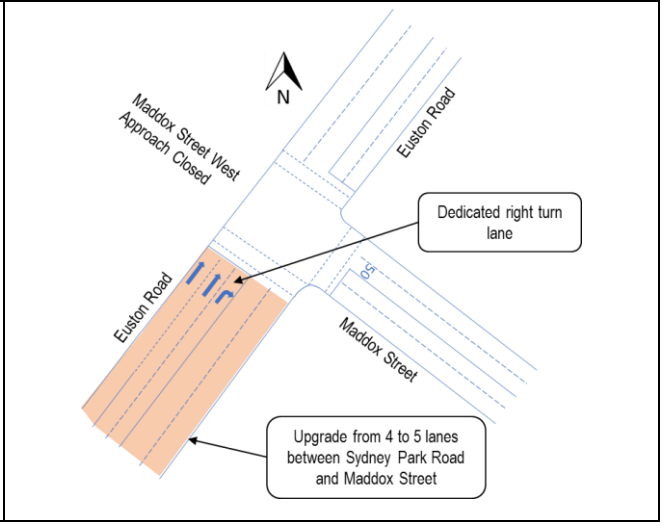
Euston Road / Maddox Street Intersection

The Euston Road / Maddox Street intersection configuration has two lanes on each approach allowing through movements, although the left hand lanes are shortened due to parked vehicles. Left turn movements are allowed from the left hand lane on each approach, whilst right turn movements are banned from Euston Road north. Right turn movements are currently allowed from the right hand lane on all other approaches, although these movements can cause queueing in through traffic lanes.

It is proposed, as part of the WestConnex upgrades, that a dedicated left turn lane be constructed on Euston Road south, with Euston Road expanded from four travel lanes to five travel lanes just south of the intersection with Maddox Street and six travel lanes just north of the intersection with Sydney Park Road. The road widening is to provide added capacity for vehicles from the New M5 Motorway exiting the St Peters Interchange onto Euston Road. It is also proposed to ban the existing right turn movement from Euston Road (south) to Maddox Street (east).

As part of this assessment, it is assumed that Euston Road expanded from four travel lanes to five travel lanes south of Maddox Street (three northbound lanes and two southbound lanes). It is also assumed that Maddox Street (W) is closed to traffic and a dedicated lane is provided for the Euston Road right turning traffic from the south. The existing and proposed intersection layouts are shown in Table 8.4.

Table 8.4: Existing and Proposed Intersection Layout – Euston Rd / Maddox St

Existing Intersection Layout	Proposed Intersection Layout
	

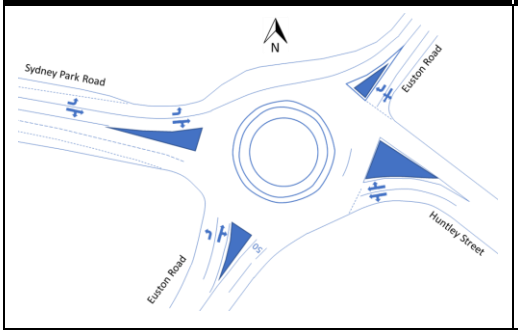
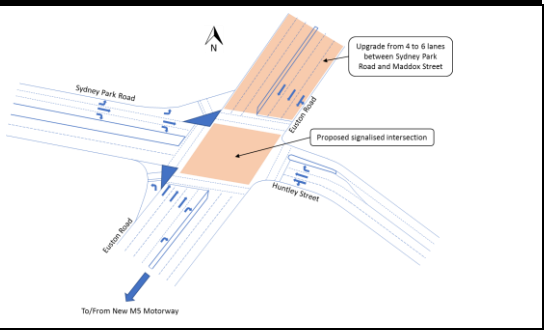
Sydney Park Road / Euston Road / Huntley Street Intersection

The Sydney Park Road / Euston Road intersection is currently a roundabout, with approaches from the north and south on Euston Road, the east on Huntley Street and the west on Sydney Park Road. Each approach has two lanes with all movements allowed.

It is proposed, as part of the WestConnex upgrades that The Sydney Park Road / Euston Road / Huntley Street intersection be upgraded to a signalised intersection. The intersection will feature three through lanes in each direction on Euston Road, with a dedicated right turn lane on the northbound approach. Left turn movements will be made from short slip lane from the south and from a shared through lane from the north. Sydney Park Road will have one lane dedicated for left turn, right turn and through movements, whilst Huntley Street will have one through lane, a dedicated right turn lane and a shared through and left turn lane. The increased capacity and signalisation of this intersection is designed to manage increased traffic volumes to and from the St Peters Interchange, associated with the New M5 Motorway.

The existing intersection layout and concept of the proposed intersection layout are shown in Table 8.5.

Table 8.5: Existing and Proposed Intersection Layout – Sydney Park Rd/Euston Rd/Huntley St

Existing Intersection Layout	Proposed Intersection Layout
	

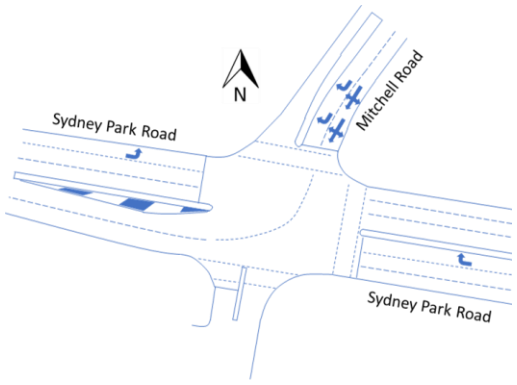
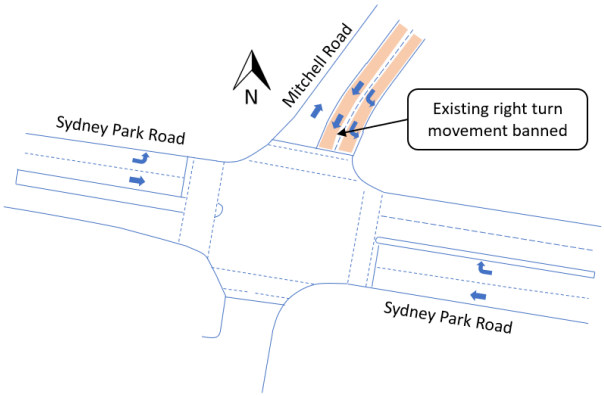
Sydney Park Road / Mitchell Road Intersection

The Sydney Park Road / Mitchell Road intersection configuration has two approaches, from the east and west, on Sydney Park Road, one approach from the north on Mitchell Road and an approach from Sydney Park car park from the south. Currently two through lanes are provided in each direction on Sydney Park Road, with a dedicated left turn lane from the west and a dedicated right turn lane from the east. Right turn movements are able to be made from both lanes on the Mitchell Road approach, with through and left turn movements allowed from the left-hand lane.

As part of the WestConnex upgrades a right turn ban is proposed from Mitchell Road to encourage vehicles to access Sydney Park Road from Euston Road rather than Mitchell Road. The right-hand lane will be for through movements only and the left hand lane for left turn movements only.

The existing intersection layout and a concept of the proposed intersection layout are shown in Table 8.6.

Table 8.6: Existing and Proposed Intersection Layout – Sydney Park Rd / Mitchell Rd

Existing Intersection Layout	Proposed Intersection Layout
	

Mitchell Road / Maddox Street / MacDonald Street Intersection

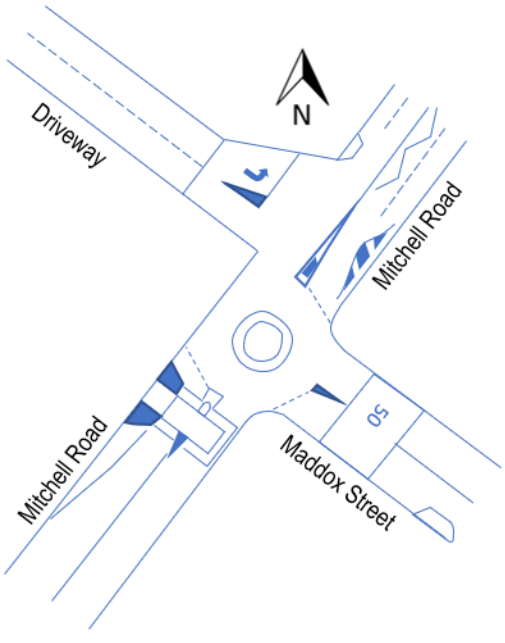
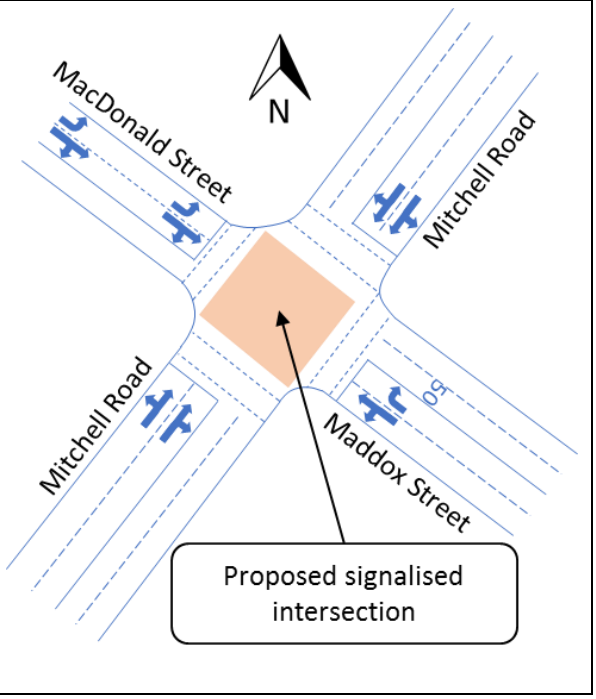
The Mitchell Road / Maddox Street intersection is currently a roundabout, with two approaches on Mitchell Road running north-south and one approach on Maddox Street from the east. Each approach consists of one lane with all movements allowed.

As part of the Ashmore Precinct Development upgrades it is proposed that the existing intersection be converted to a signalised intersection with the addition of a western approach on MacDonald Street, providing access to the Ashmore Precinct.

Each approach will consist of two lanes with through movements allowed from each lane on Mitchell Road and left turns from the left lane and right turns from the right lane in both directions. Right turn movements on Maddox Street will be made from a dedicated right turn lane and left turn movements from MacDonald Street will be made from a dedicated left turn lane. The design is proposed to allow access to the new Ashmore Precinct.

The existing intersection layout and the concept for the proposed intersection layout are shown in Table 8.7.

Table 8.7: Existing and Proposed Intersection Layout – Mitchell Rd/Maddox St/MacDonald St

Existing Intersection Layout	Proposed Intersection Layout
	

8.2.2 Traffic Assignment

In consultation with CoS, estimated traffic volumes for 2021 were used for the year 2019 assessment. Manual traffic demand adjustments were required for changes in origins and destinations of "external-to-external" trips, resulting from the proposed traffic management measures (e.g. turn bans). For example, the reduction of capacity for a section of Sydney Park Road, along with the improvement of Campbell Street and Euston Road, would divert a substantial number of trips currently using both the Princes Highway, north of Campbell Street, and Sydney Park Road to access the Campbell Street / Euston Road route. Manual adjustments were made in the traffic matrices to reflect these changes. The other key changes include:

- the right turn ban from Mitchell Road to Sydney Park Road. A portion of the traffic travelling between the north-east of the study area (Botany Road) and King Street will use the Mitchell Road / Coulson Street / Concord Street corridor, and some will use Fountain Street / Mitchell Road / Copeland Street;
- the right turn ban from Euston Road (N) to Sydney Park Road;
  - traffic currently using Sydney Park Road and the Princes Highway to travel south and west are diverted via Euston and Campbell Roads;
  - traffic currently using Sydney Park Road to access King Street are diverted via Fountain Street, Mitchell Road and Copeland Road if they are approaching from the east; and
  - vehicles approaching from the Sydney CBD and further north are removed from the model entirely.
- the right turn ban from Euston Road (S) into Maddox Street: traffic currently accessing Maddox Street (E) from Euston Road and Sydney Park Road are diverted to Huntley Street.

8.2.3 Network Performance

The existing condition VISSIM model was updated to reflect all of the above committed infrastructure improvements. The traffic modelling outputs are provided in **Appendix E**.

Traffic Volumes

Between 2016 and 2019 two-way traffic on Euston Road will experience an increase of between 40% and 70% (840 and 1,325 vehicles/ hr).

A comparison of the 2016 to 2019 AM peak traffic flows is provided in Figure 8.2. The key observations are:

- traffic volumes on Maddox Street are predicted to increase by 350 vehicles / hr (63%);
- Harley Street would experience an increase in traffic of 60 vehicles /hr (67%);
- traffic on Fountain Street is predicted to increase by 90 vehicles / hour or 13%;
- the northern section of Mitchell Road experiences a substantial increase in traffic volumes with 330 vehicles/hr or 33%;
- Coulson Street experiences a substantial increase of 200 vehicles / hr (47%);
- traffic on McEvoy Street (east of Botany Road) increases by 100 vehicles/ hr or 8%; and
- the traffic demand on Copeland Street increases by 110 vehicles/hr (16%). The traffic signal at this intersection operates at capacity therefore cannot accommodate any additional traffic.

A comparison of the 2016 to 2019 PM peak traffic flows is provided in Figure 8.3. The key observations are:

- traffic volumes on Maddox Street are predicted to increase by 420 vehicles / hr (200%);
- Harley Street experiences an increased traffic of 30 vehicles /hr (38%);
- traffic on Fountain Street increases by 80 vehicles / hour or 11%;
- Coulson Street experiences a substantial increase of 350 vehicles / hr (90%);
- traffic on McEvoy Street (east of Botany Road) increases by 320 vehicles/ hr or 32%; and
- marginal increase on Copeland Street by 70 vehicles/hr (9%).

A comparison of the 2016 to 2019 weekend peak traffic flows is provided in Figure 8.4. The key observations are:

- traffic volumes on Maddox Street are predicted to increase by 570 vehicles / hr (271%);
- Harley Street and Fountain Street would experience an increase of traffic volumes between 70 and 40 vehicles /hr. These increases are low as compared to the net increase on Maddox Street. The substantial increase on Maddox Street is attributed to new traffic signal at the Fountain Street intersection as well as additional traffic from the Ashmore Precinct;
- traffic on Fountain Street increases by 40 vehicles / hour or 6%;
- the northern section of Mitchell Road experiences a decrease of 190 vehicles/hr or 16%;
- Coulson Street would experience an increase of 90 vehicles / hr (16%);
- traffic on McEvoy Street (east of Botany Road) increases by 290 vehicles/ hr or 32%; and
- traffic on Copeland Street would increase by 80 vehicles/hr or 11%.

Traffic volumes on key local streets, including Maddox Street and Coulson Street are predicted to increase substantially. The “Do Minimum” analysis shows traffic volumes on Maddox Street are predicted to increase between 350 and 570 vehicles/ hr. In the AM peak the two-way movement on Maddox Street is shown to be around 900 vehicles / hr.

Traffic volumes on Mitchell Road are predicted to increase substantially in the AM peak, by up to 33%. With residential frontages on both sides of Mitchell Road, the projected increase in traffic volumes would be expected to generate a significant impact on the amenity for residents. The traffic flows and volumes per direction are available in **Appendix F**.

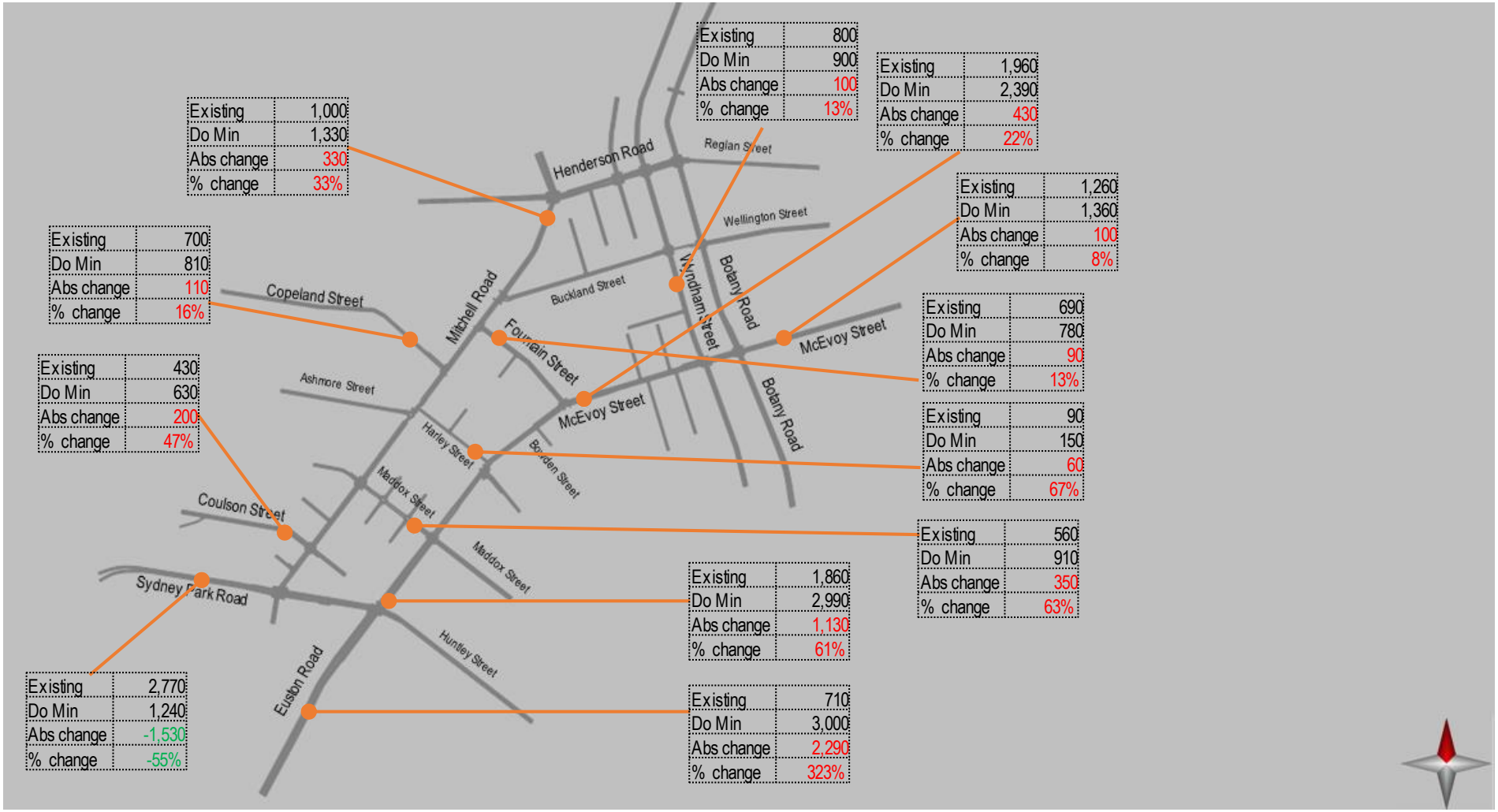


Figure 8.2: Comparison of the 2016 and 2019 AM peak Traffic Volumes.

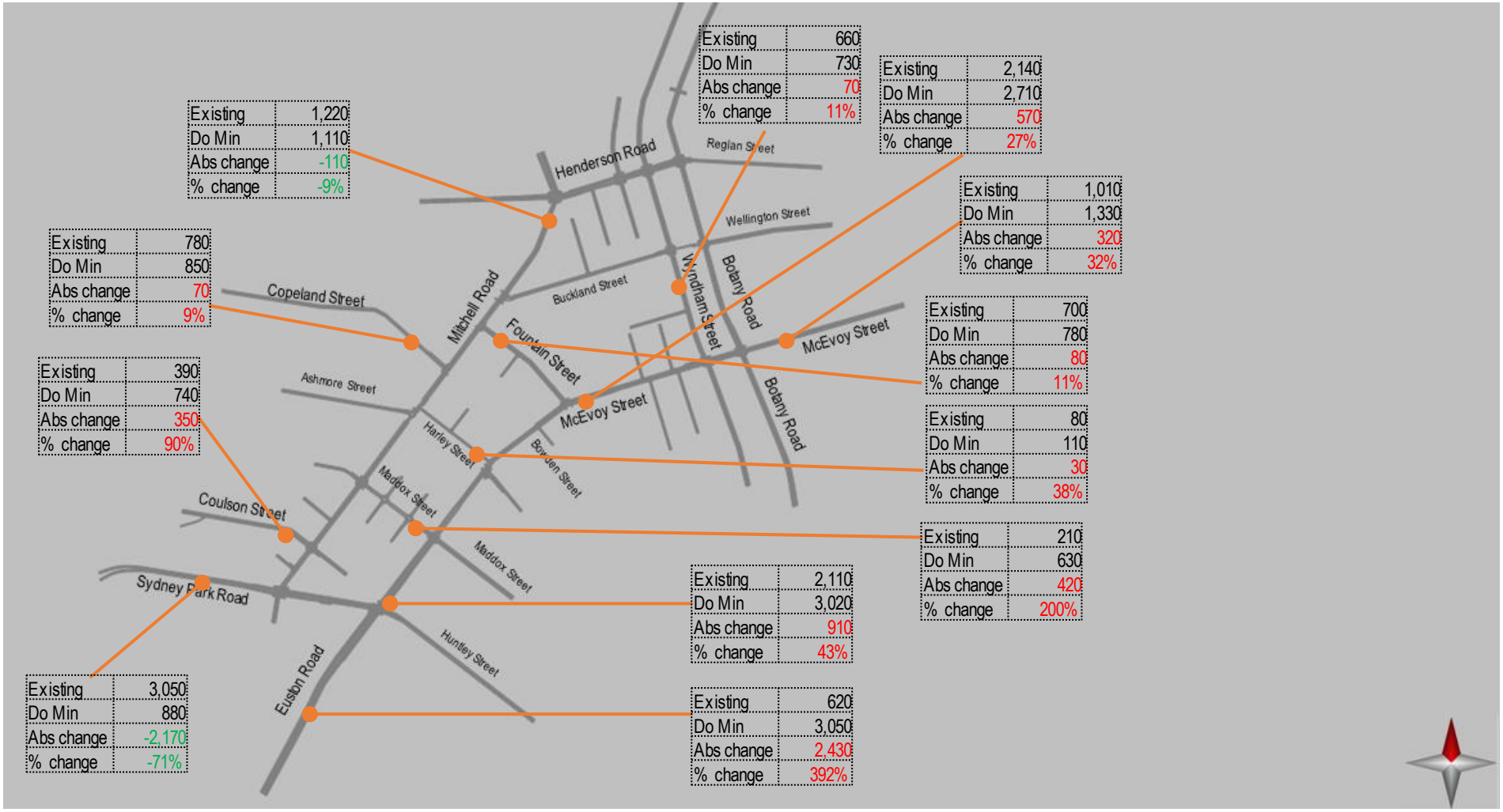


Figure 8.3: Comparison of the 2016 and 2019 PM peak Traffic Volumes.

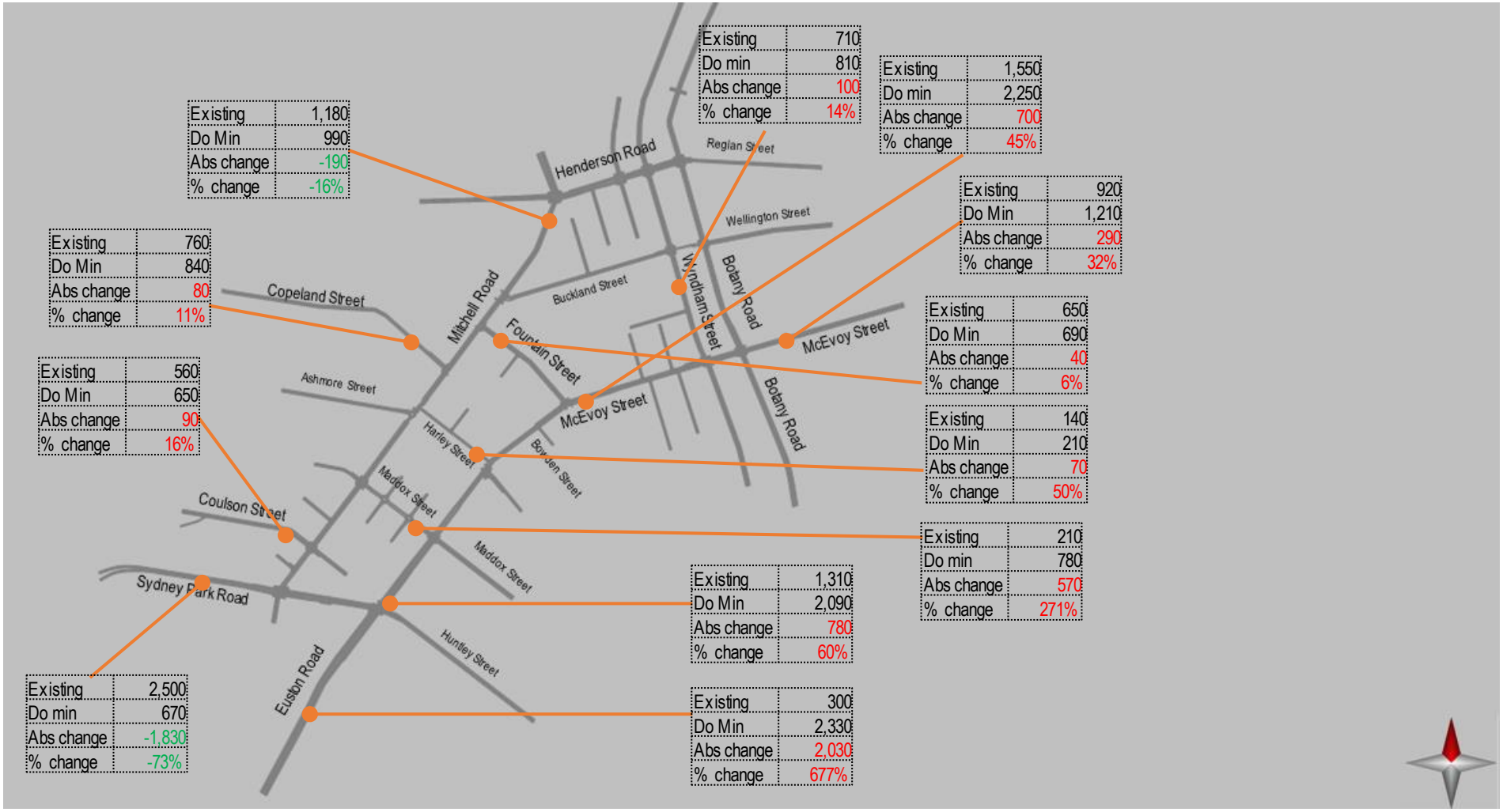


Figure 8.4: Comparison of the 2016 and 2019 Weekend peak Traffic Volumes.

Key Pinch Points

In the AM peak, the Euston Road / Maddox Street intersection, demand exceeds its capacity and long queues are predicted northbound on Euston Road and into Sydney Park Road and Maddox Street, as shown in Figure 8.5. As a result of the congestion, over 300 vehicles/hr eastbound on Sydney Park Road and 150 vehicles/hr westbound on Maddox Street could not be serviced.

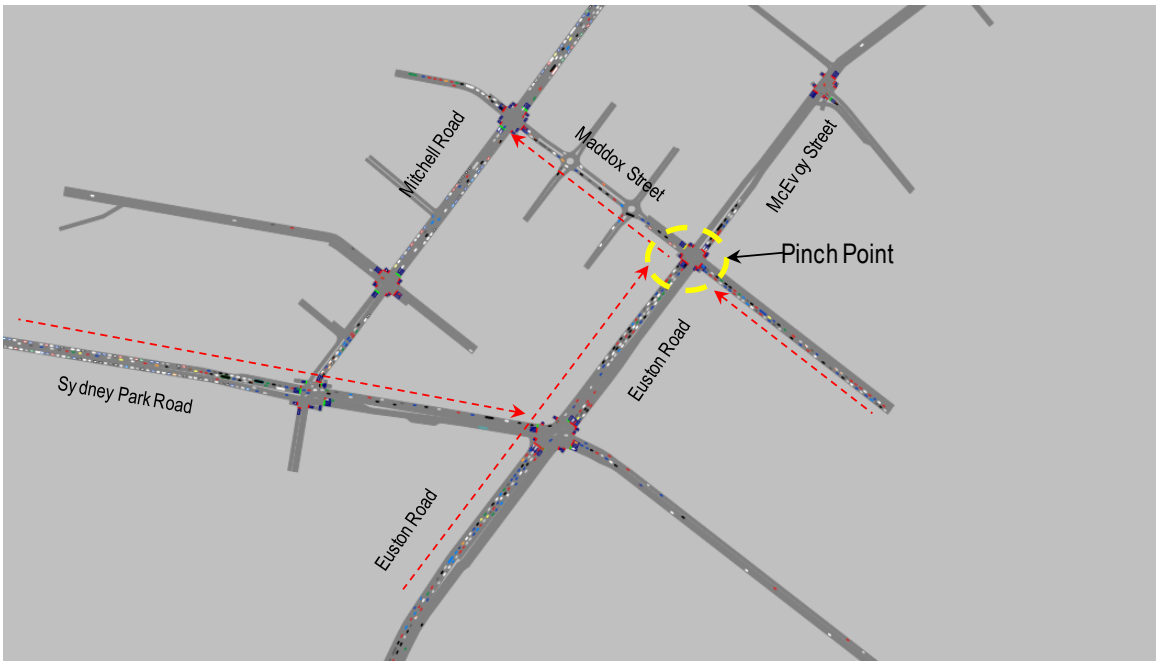


Figure 8.5: Congestion at Euston Road / Maddox Street Intersection - 2019 AM "Do Minimum"

In the AM peak, long queues are also shown northbound on Mitchell Road and westbound on Fountain Street, as shown in Figure 8.6. This is due to congestion at the Mitchell Road approach to its intersection with Henderson Road.

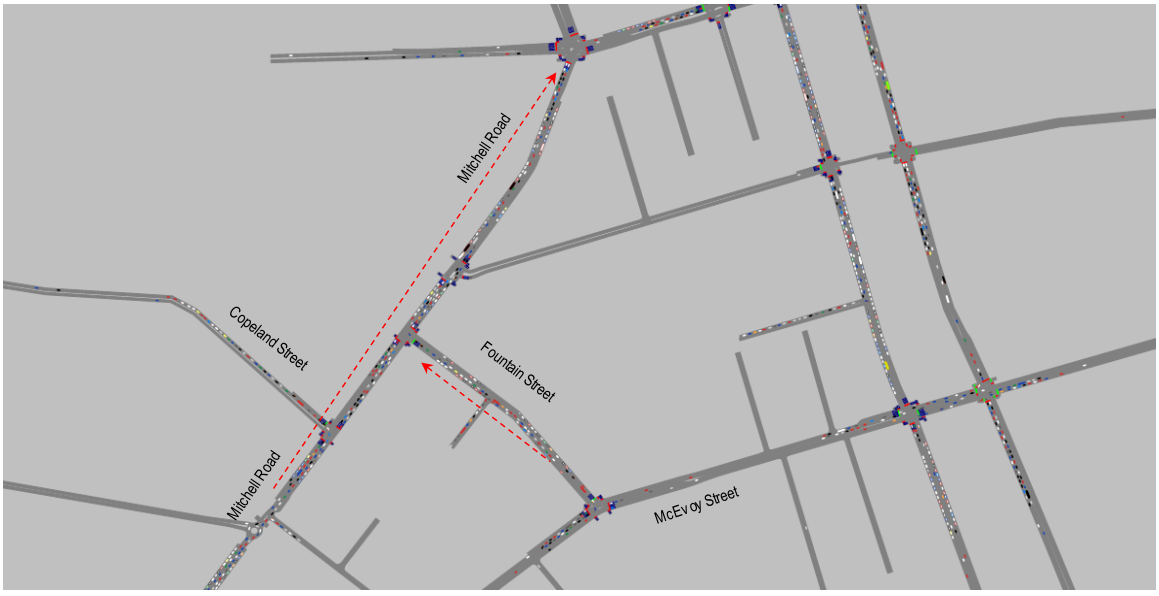


Figure 8.6: Congestion Mitchell Road - 2019 AM "Do Minimum"

In the PM peak, long queues are shown on McEvoy Street westbound, Botany Road northbound and Wyndham Street northbound as shown in Figure 8.7. The proposed additional traffic capacity at the McEvoy Street intersections with Botany Road and with Wyndham Street is insufficient to service the traffic demand. As a result, over 500 vehicles/hr could not enter into the study area from McEvoy Street westbound and Wyndham Street northbound.

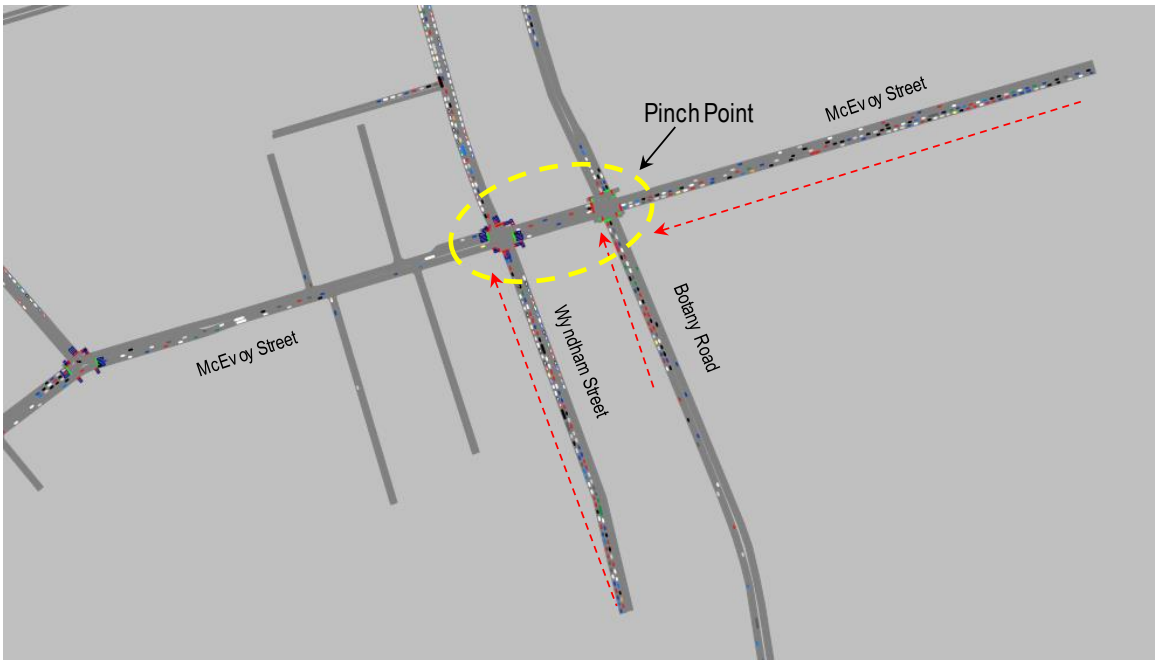


Figure 8.7: Congestion Mitchell Road - 2019 PM "Do Minimum"

No substantial congestion is predicted in the weekend peak primarily due to the proposed additional traffic capacity along with the parking ban on the McEvoy Street - Euston Road corridor.

Travel Times

The 2019 AM peak clockwise and counter-clockwise travel time results were compared with the existing travel times, and are shown graphically in Figure 8.8 and Figure 8.9. Travel times in both directions are predicted to increase substantially. In the counter-clockwise direction, travel times around the block are predicted to increase 50% by 2019 with the most notable increases on Mitchell Road southbound and Euston Road eastbound.

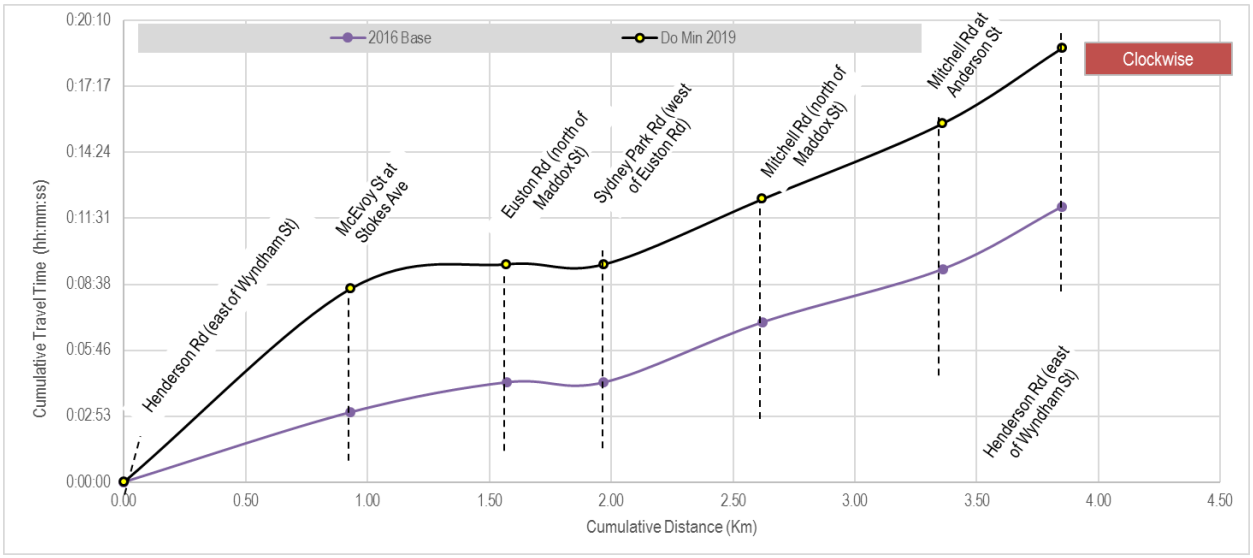


Figure 8.8: Travel Time Comparison – Clockwise 2019 AM "Do Minimum"

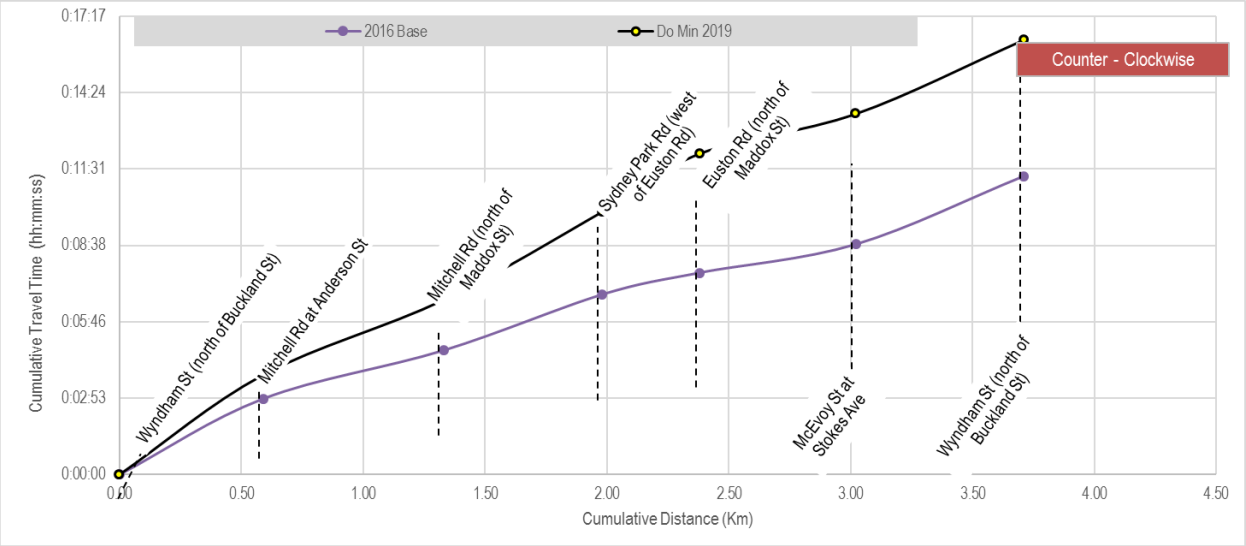


Figure 8.9: Travel Time Comparison – Counter Clockwise 2019 AM "Do Minimum"

The 2019 PM peak travel time results are provided in **Appendix E**. No substantial increases are shown. This is due to a substantial number of vehicles that could not enter into the study area through the intersections at the edge of the modelled area. This was primarily due to congestion at the McEvoy Street intersections with Botany Road and with Wyndham Street.

The 2019 weekend peak travel time results are provided in **Appendix E**. No notable changes are predicted and the "Do Minimum" network is predicted to service the additional traffic.

8.3 OPTION 1 – HARLEY STREET CLOSED AT BOTH ENDS

8.3.1 Layout

In addition to the "Do Minimum" works, Option 1 includes the closure of Harley Street at Mitchell Road and at Euston Road / McEvoy Street and the closure of Lawrence Street at its midpoint between Maddox Street and Harley Street.

These road closures remove a potential rat run between Euston Road / McEvoy Street and Mitchell Road, along with the use of Harley Street as a potential rat run.

The conceptual layouts of the road closures are shown in Figure 8.10-Figure 8.12.

Figure 8.10: Proposed LATM Measures – Harley Street west closure

Figure 8.11: Proposed LATM Measures – Harley Street east closure

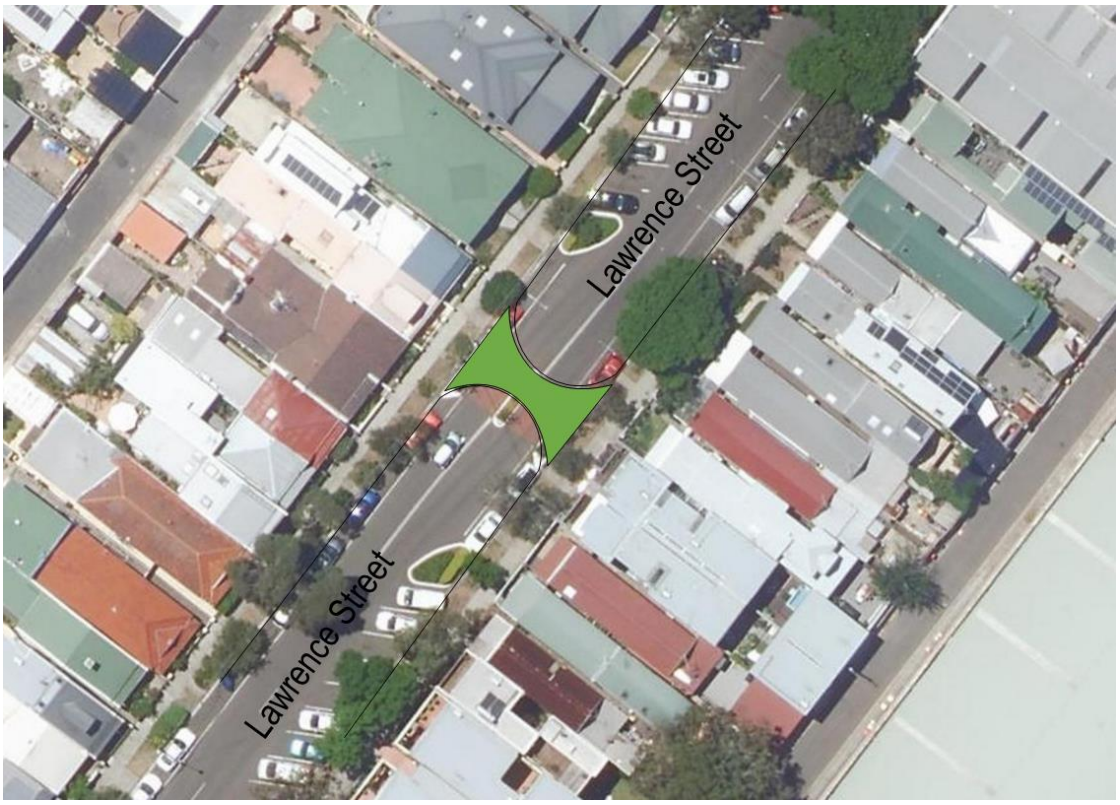


Figure 8.12: Proposed LATM Measures – Lawrence Street closure

8.3.2 Network Performance

The proposed closure and the removal of the potential for through traffic on Harley Street is predicted to have substantial impact on traffic flows in the AM peak network. Vehicles from the south-west side of the network (e.g. Euston Road), currently using Harley Street, would be diverted along the Sydney Park Road / Mitchell Road corridor, resulting in significant queuing on Mitchell Road in both the northbound and southbound directions. Traffic volumes on Fountain Street are predicted to increase by over 200 vehicles/hr as compared to 90 vehicles/hr in the "Do Minimum" scenario.

In the AM peak, substantial queuing is predicted in the south-western part of the network, including queues on the Euston Road northbound, Sydney Park Road eastbound, Maddox Street westbound and Huntley Street westbound, as shown in Figure 8.13. Almost 300 vehicles/hr total from Euston road northbound and Sydney Park Road eastbound were not be able to enter into the network.

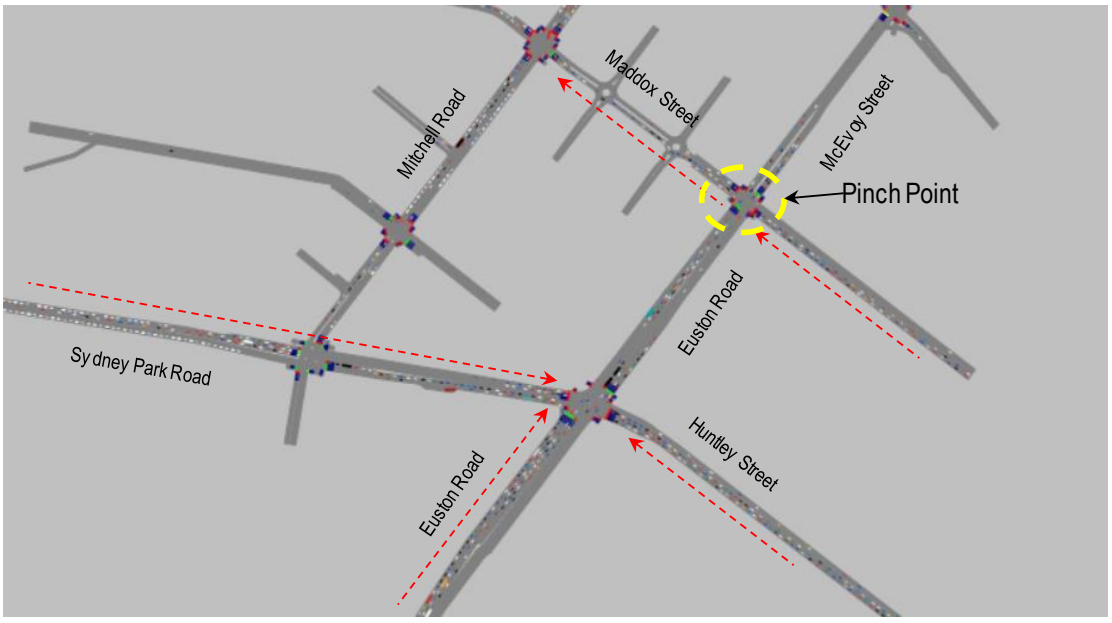


Figure 8.13: Congestion at Euston Road / Maddox Street Intersection - 2019 AM Option 1

The closure of Harley Street is not predicted to influence the PM and weekend peak traffic performance, when compared to the "Do Minimum" scenario. As in the "Do Minimum" PM peak scenario, substantial queuing is predicted at the McEvoy Street intersections with Botany Road and with Wyndham Street. The network is predicted to operate satisfactorily in the weekend peak.

The traffic modelling outputs are provided in **Appendix G.**

8.4 OPTION 2 – MADDOX STREET CLOSED AT THE EASTERN END

8.4.1 Layout

In addition to the "Do Minimum" works, option 2 consists of the closure of Maddox Street at Euston Road, blocking access to and from Bourke Road across Euston Road. This option would reduce the traffic volumes from Maddox Street on the existing four-way signalised intersection, improving the approaches on Euston Road and from Maddox Street east.

The conceptual layout of the road closure is shown in Figure 8.14. The road closure results in the removal of a rat run between Euston Road and Mitchell Road.

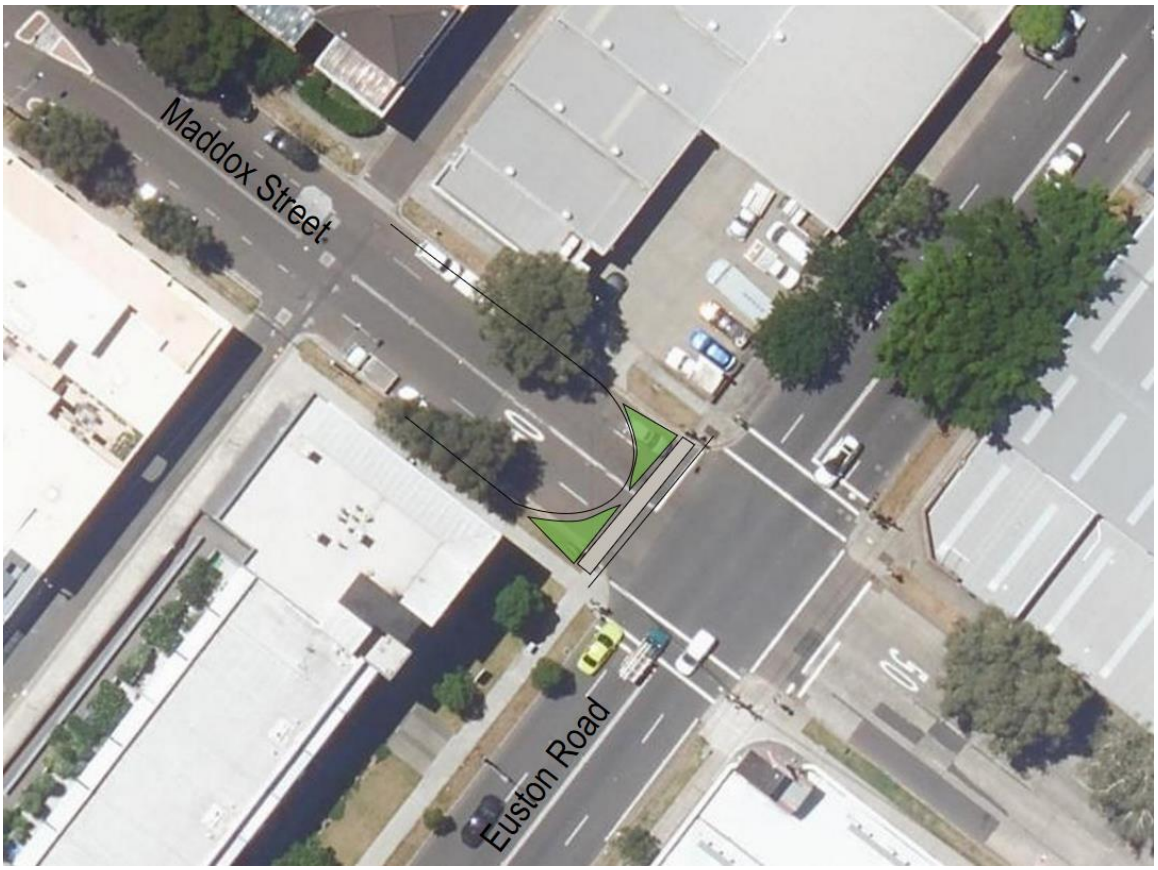


Figure 8.14: Proposed LATM Measures – Maddox Street closure

8.4.2 Network Performance

The removal of through traffic on Maddox Street is predicted to have substantial impact on traffic flows on Euston Road and Mitchell Road in the AM peak. Vehicles currently using Maddox Street would be diverted to Harley and Fountain Streets. Traffic volumes on these roads are predicted to have substantial increases: 400 vehicles/hr (444%) and 550 vehicles/hr (80%).

Northbound traffic queues on Euston Road / Harley Street would extend to the Sydney Park Road intersection, and resulted in 360 unreleased vehicles from the Euston Road entry (northbound). These queues are shown in Figure 8.15.

Figure 8.15: Congestion at Euston Road / Harley Street Intersection - 2019 AM Option 2

In the PM peak, traffic volumes on Harley Street would also experience substantial increase of 200 vehicles/hr (250%). As in the PM peak "Do Minimum" scenario, substantial queuing is predicted at the McEvoy Street intersections with Botany Road and with Wyndham Street.

The network is predicted to operate satisfactorily in the weekend peak.

The traffic modelling outputs are provided in **Appendix H**.

8.5 Option 3 – Harley Street Closed at Both Ends and Maddox Street Closed at its Eastern End

8.5.1 Layout

Option 3 is a combination of Option 1 and Option 2. The closure of Harley Street at Mitchell Road and Euston Road / McEvoy Street and the closure of Lawrence Street at the mid-point between Maddox Street and Harley Street is added to by the closure of Maddox Street at Euston Road, blocking access to and from Bourke Road across Euston Road.

The implementation of the road closures results in the removal of rat run possibilities between Mitchell Road and Euston Road anywhere between Fountain Street in the north and Huntley Street/Sydney Park Road in the south, ensuring the local streets and lanes within this area are maintained for local traffic, regardless of congestion experienced on the surrounding traffic network. The layouts of the road closures are shown in Figure 8.10 to Figure 8.12 and Figure 8.14.

8.5.2 Network Performance

The proposed closure of Maddox Street and Harley Street for through traffic is predicted to substantially increase the AM peak traffic volumes on Fountain Street. Compared to the "Do Minimum" scenario, the two-way traffic movement would increase by almost 990 vehicles/ hour; a 143% increase.

In the AM peak, northbound queues on Euston Road - McEvoy Street from its intersection with Fountain Street would extend to the Sydney Park Road intersection as shown in Figure 8.16. These queues were evident in the model, with 550 vehicles unreleased into the network from Euston Road northbound, south of its intersection with Sydney Park Road.

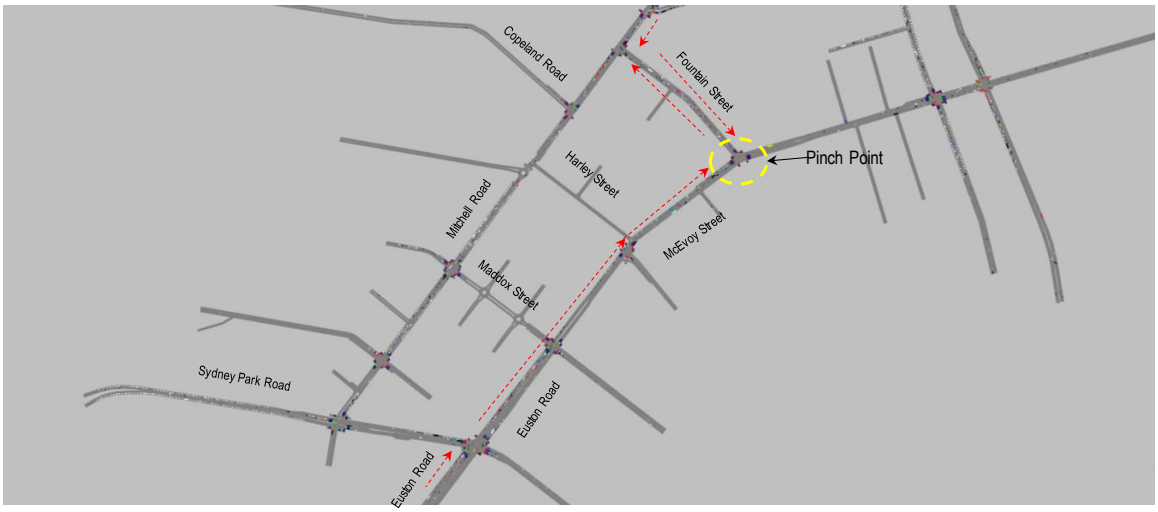


Figure 8.16: Congestion at McEvoy Street / Fountain Street Intersection - 2019 AM Option 3

In the PM peak, traffic volumes on Fountain Street would also experience a substantial increase with an extra 230 vehicles/hr (33%). As in the PM peak "Do Minimum" scenario, substantial queuing is predicted at the McEvoy Street intersections with Botany Road and with Wyndham Street.

The network is predicted to operate satisfactorily in the weekend peak.

The traffic modelling outputs are provided in **Appendix I.**

8.6 OPTION 4 – BOTH BRENNAN STREET AND LOVERIDGE STREET CLOSED

8.6.1 Layout

Option 4 consists of the closure of Brennan Street and Loveridge Street at McEvoy Street, blocking rat run opportunities for vehicles looking to access Wyndham Street by avoiding congestion at the Wyndham Street / McEvoy Street intersection. School bus access provided by bus service 355 to and from Alexandria Park Community School would have to be diverted off its current route on Loveridge Street. The access to Anderson Street from Mitchell Road is also proposed to be closed, with local access to Anderson Street gained from Phillip Street only.

The conceptual layouts of the road closures are shown in Figure 8.17 and Figure 8.18.

Figure 8.17: Proposed LATM Measures – Loveridge Street closure

Figure 8.18: Proposed LATM Measures – Brennan Street closure

Figure 8.19: Proposed LATM Measures – Anderson Street closure

8.6.2 Network Performance

The Option 4 AM peak network would provide similar performance levels as the "Do Minimum" network. Substantial queuing is predicted on Euston Road northbound, Sydney Park Road eastbound and on Mitchell Road. The Euston Road intersection with Maddox Street is predicted to be a pinch point in the network. A substantial increase in traffic volumes is predicted on local streets including Maddox Street, Fountain Street, Harley Street and Mitchell Road. Over 280 vehicles/hr on Euston Road northbound, and 280 vehicles/hr on from Maddox Road westbound were not be able to enter the network.

The Option 4 PM peak network will also provide similar level of performance as the "Do Minimum" network. As in the "Do Minimum" network, long queues are predicted on McEvoy Street westbound, Botany Road northbound and Wyndham Street northbound.

The network is predicted to operate satisfactorily in the weekend peak.

The traffic modelling outputs are provided in **Appendix J**.

8.7 OPTION 5 – MADDOX STREET, HARLEY STREET, BRENNAN STREET AND LOVERIDGE STREET CLOSED (COMBINATION OF OPTION 3 AND OPTION 4)

8.7.1 Layout

Option 5 is combination of Option 3 and Option 4. The closure of Harley Street and Maddox Street for through traffic, as in Option 3, and the closure of Brennan Street and Loveridge Street at McEvoy Street, as in Option 4. Option 5 includes the mid-block closure of Lawrence Street between Maddox and Harley Streets.

The implementation of the road closures results in the removal of rat run possibilities from sensitive local streets such as Harley Street, Maddox Street, Brennan Street and Loveridge Street.

8.7.2 Network Performance

In the AM peak, Option 5 is predicted to produce substantial increases in traffic volumes on Fountain Street.

In the AM peak, a proportion of the traffic currently travel from the south-west part of the network (e.g. Euston Road) towards Sydney City, using Brennan Street or Loveridge Street to bypass the McEvoy Street / Wyndham Street intersection. In the 2019 network, to avoid substantial delays on Wyndham Street northbound, these vehicles would alternatively use Mitchell Road. This increased demand in Mitchell Road results in flow breakdown at the McEvoy Street / Fountain Street intersection earlier than under the "Do Minimum" scenario. In the modelling, this resulted in "gridlock" towards the end of the peak period. The two-way traffic movement on Fountain Street would increase by over 930 vehicles/hr under this option; a 135% increase.

As a result of queues on Euston Road northbound at its intersection with Sydney Park Road, over 320 vehicles/hr could not enter into the study area from Euston Road. These vehicles are likely to queue back in to the future St Peters interchange.

In the PM peak, traffic volumes on Fountain Street would also experience a substantial increase of 320 vehicles/hr (or 46%). As in the "Do Minimum" PM peak scenario, substantial queuing is predicted at the McEvoy Street intersections with Botany Road and with Wyndham Street.

The network is predicted to operate satisfactorily in the weekend peak.

The traffic modelling outputs are provided in **Appendix K**.

9. SUMMARY AND CONCLUSIONS

9.1 OVERVIEW

The proposed WestConnex interchange at St Peters is due to open to traffic in 2019, servicing the new M5 initially before servicing the proposed M4-M5 link which is expected to open in 2023. At the completion of construction of WestConnex in 2023, it is expected the daily traffic volume on Euston Road will increase by up to 80%. As part of the WestConnex project, it is proposed to increase capacity of the state road network surrounding the St Peters Interchange. This includes additional travel lanes on Euston Road between Campbell Road and Maddox Street.

CoS commissioned Bitzios Consulting to develop a traffic microsimulation model to quantify the benefits of Local Area Traffic Management (LATM) schemes, to assist with the management of additional traffic predominantly from the WestConnex project in Alexandria, Erskineville and St Peters.

During the course of the study three technical sessions were run with CoS to develop the various traffic management measures tested in the model.

This traffic and transport report documents the proposed traffic management measures and summarises the traffic performance of the proposed measures.

9.2 KEY ISSUES

The AM, PM and weekend traffic experiences substantial delays at the Botany Road / McEvoy Street and Henderson Road / Botany Road intersections. Queues of slow moving vehicles are observed along Euston Road / McEvoy Street and along the Wyndham Street and Henderson Road corridors. Closely spaced signalised intersections and heavy volumes of conflicting traffic generates most of the congestion.

Major developments and infrastructure changes are predicted to substantially increase traffic volumes within the study area's road network. Based on limited information obtained from the WestConnex project's impacts, future traffic volumes on Euston Road are predicted to increase substantially. An additional 1,170 vehicles/hr in the AM peak (63%) and an additional 860 vehicles/hr (41%) in the PM peak are expected between 2016 and 2021.

A number of network improvement measures are currently being implemented (or being planned) to improve traffic conditions within the study area. The modelling has shown that these measures are insufficient to service the substantial increase in future traffic volumes. The effects of this are expected to include the diversion of through traffic to local residential streets within the study area unless traffic management schemes are put in place to restrain or remove through traffic demand.

9.3 DEVELOPMENT OF LOCAL AREA TRAFFIC MANAGEMENT MEASURES

A "Do Minimum" option was developed incorporating the intersection and link upgrades committed to and detailed in other projects related to the study area. A number of improvement measures were proposed for the Euston Road / McEvoy Street corridor including banning peak hour kerbside parking to maintain two lanes of traffic. As part of the WestConnex Project, the section of Euston Road between Sydney Park Road and Maddox Street is proposed to include seven lanes at the Sydney Park Road end before reducing to five lanes at the intersection with Maddox Street.

Local area traffic management options were developed in consultation with CoS. The proposed measures ranged from the introduction of slow points to complete closure of local roads and these were generally "low-cost" traffic management measures. These measures were packaged together to create five options as follows:

- **Option 1:** the closure of Harley Street to through traffic;
- **Option 2:** the closure of Maddox Street to through traffic;
- **Option 3:** the combination of Options 1 and 2 (i.e. the closure of Harley Street and Maddox Street);
- **Option 4:** the closure of Loveridge Street and Brennan Street to through traffic; and

- **Option 5:** combination of Options 3 and 4 (i.e. the closure of Harley Street, Maddox Street, Loveridge Street and Brennan Street).

A calibrated and validated existing conditions VISSIM model for the study area was coded and used to assess the traffic performance of the "Do Minimum" option and the five proposed LATM scheme options.

9.4 ASSESSMENT OF LOCAL AREA TRAFFIC MANAGEMENT MEASURES

Do Minimum

Traffic volumes on Maddox Street are predicted to increase between 350 and 570 vehicles/hr. Traffic volumes on Mitchell Road are also predicted to increase substantially in the AM peak and with residential frontages on both sides of Mitchell Road, this increase would impact the amenity of residents.

In the AM peak, the Euston Road intersection with Maddox Street has insufficient capacity to service traffic demands volumes generating long queues on Euston Road northbound and on Sydney Park Road and Maddox Street. As a result, over 300 vehicles entering from Sydney Park Road eastbound and 150 vehicles from Maddox Street westbound could not be serviced.

In the PM peak, the proposed additional traffic capacity at the McEvoy Street intersections with Botany Road and with Wyndham Street is not adequate to service the predicted traffic volumes resulting in over 500 vehicles not entering into the study area from McEvoy Street westbound and Wyndham Street northbound.

Option 1

The proposed closure of Harley Street is predicted to have substantial impact on traffic flows in the AM peak. Vehicles from the south-west (e.g. Euston Road) currently using Harley Street would be diverted along the Sydney Park Road / Mitchell Road corridor resulting in significant queuing on Mitchell Road both northbound and southbound. Also, traffic volumes on Fountain Street are predicted to increase by over 200 vehicles/hr as compared to the 90 vehicles/hr increase in the "Do Minimum" scenario.

In the AM peak, significant queues are predicted at the Euston Road / Maddox Street intersection. Over 300 vehicles/hr total from Euston Road northbound Sydney Park Road eastbound were not able to enter into the network.

The closure of Harley Street is not predicted to influence the PM and weekend peak traffic performance when compared to the "Do Minimum" scenario.

Option 2

The proposed closure of Maddox Street would divert traffic on Euston Road northbound to Harley Street and Fountain Street. Traffic volumes on these roads are predicted to increase by over 400 vehicles / hr on Harley Street and 550 vehicles / hr on Fountain Street in the AM peak period.

In the AM peak, significant queues are predicted at the Euston Road / Harley Street intersection. In the PM peak, like in the "Do Minimum" scenario, substantial queuing is predicted at the McEvoy Street intersections with Botany Road and with Wyndham Street. This intersection would be a key pinch point in the network.

Option 3

The proposed closure of Harley Street and Maddox Street, as in Option 1 and 2, is predicted to substantially increase traffic on Fountain Street in both the AM and PM peak periods. Compared to the "Do Minimum" scenario, in the AM peak the two-way traffic movement on Fountain Street would increase by 990 vehicles/ hour; an increase of 143%. Queues on the Euston Road / McEvoy Street northbound from its intersection with Fountain Street would extend to the Sydney Park Road intersection. This resulted in 550 vehicles being unable to enter into the network from Euston Road.

Option 4

The Option 4 AM peak network would provide a similar performance to the "Do Minimum" network with substantial queuing predicted on the Euston Road northbound, Sydney Park Road eastbound and on

Mitchell Road. The Euston Road intersection with Maddox Street is predicted to be a key pinch point in the network.

The Option 4 PM peak network will also provide similar performance as the "Do Minimum" network.

Option 5

The AM peak, Option 5 (the combination of Option 3 and Option 4) is predicted to provide similar traffic performance as Option 3 resulting in flow breakdown at the McEvoy Street / Fountain Street intersection much earlier than in the "Do Minimum" option. In the modelling, this resulted in "gridlock" towards the end of the peak period. The two-way traffic movement on Fountain Street would increase by over 930 vehicles/ hour, a 135% increase. Over 320 vehicles could not enter into the study area from Euston Road. These vehicles are likely to queue back in to the future St Peters interchange.

In the PM peak, traffic volumes on Fountain Street would also experience a substantial increase with 320 vehicles/hr (46%). As in the PM peak "Do Minimum" scenario, substantial queuing is predicted at the McEvoy Street intersections with Botany Road and with Wyndham Street.

9.5 OVERALL CONCLUSIONS

The future WestConnex multi-level interchange at St Peters will substantially increase traffic volumes in the local residential streets within the study area including in Maddox Street, Harley Street and in Mitchell Road. LATM option 5 (closure of Maddox Street, Harley Street, Loveridge Street and Brennan Street) will provide the best outcomes in terms of reducing traffic volumes on these streets, however, this substantially increases delays to traffic on surrounding through roads, particularly in the AM peak. Over 320 vehicles/hr of predicted demand would not be able enter into the study area from the Euston Road. These vehicles are likely to queue back in to the future St Peters interchange. In the PM peak, substantial delays are predicted at the McEvoy Street intersections with Botany Road and Wyndham Street.

In determining the preferred LATM scheme, decisions need to be made by CoS as to how much local traffic amenity is to be preserved and at what consequence to the major road network conserving the range of options presented in this report.

APPENDIX A

VISSIM MODEL CALIBRATION AND VALIDATION

TECHNICAL NOTE

APPENDIX B

LOS OF KEY MOVEMENTS AT INTERSECTIONS

APPENDIX C

PROPOSED LOCAL AREA TRAFFIC MANAGEMENT MEASURES

APPENDIX D

PROPOSED OPTIONS

APPENDIX E

TRAFFIC MODELLING OUTPUTS – 2019 DO MINIMUM

APPENDIX F

TRAFFIC VOLUMES BY DIRECTION

APPENDIX G

TRAFFIC MODELLING OUTPUTS – 2019 OPTION 1

APPENDIX H

TRAFFIC MODELLING OUTPUTS – 2019 OPTION 2

APPENDIX I

TRAFFIC MODELLING OUTPUTS – 2019 OPTION 3

APPENDIX J

TRAFFIC MODELLING OUTPUTS – 2019 OPTION 4

APPENDIX K

TRAFFIC MODELLING OUTPUTS – 2019 OPTION 5