

# **Attachment A8**

**Traffic and Transport Report**



## 242 – 258 Young Street, Waterloo

### Transport Assessment

Prepared for: **Sustainable Development Group**

28 May 2024

## PROJECT INFORMATION

<b>Project Name:</b>	242 – 258 Young Street, Waterloo
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## Table of Contents

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<b>1</b>	<b>Introduction</b>	<b>1</b>
1.1	<i>Background</i>	1
1.2	<i>Site location</i>	2
1.3	<i>Report purpose</i>	3
<b>2</b>	<b>Existing Transport Conditions</b>	<b>4</b>
2.1	<i>Surrounding road network</i>	4
2.2	<i>Existing site access points</i>	5
2.3	<i>Public transport</i>	6
2.4	<i>Public transport accessibility</i>	10
2.5	<i>Pedestrian and cycling network</i>	11
<b>3</b>	<b>Transport and Access Strategy</b>	<b>13</b>
3.1	<i>Site access strategy</i>	13
3.2	<i>Pedestrian connections</i>	15
3.3	<i>Bicycle parking</i>	16
3.4	<i>Sustainable transport measures</i>	17
3.5	<i>Loading dock</i>	19
3.6	<i>On-street car parking impacts</i>	20
3.7	<i>On-site car parking provision</i>	20
3.8	<i>Car park design</i>	21
3.9	<i>Off-site student travel to open space</i>	22
<b>4</b>	<b>Traffic Assessment</b>	<b>23</b>
4.1	<i>Baseline traffic assumptions</i>	23
4.2	<i>Travel demand and vehicle trips</i>	23
4.3	<i>Traffic distribution</i>	24
4.4	<i>Traffic modelling</i>	26
4.5	<i>Drop off / pick up capacity</i>	29
<b>5</b>	<b>Summary</b>	<b>31</b>
	<b>Appendix A: Traffic Modelling Outputs</b>	<b>32</b>

## Figures

Figure 1	Site location and local context.....	2
Figure 2	Existing road network.....	4
Figure 3	Existing vehicular site access points.....	5
Figure 4	Public transport access.....	6
Figure 5	Sydney Metro network.....	8
Figure 6	30 minute public transport catchment from site.....	10
Figure 7	Existing cycling network.....	11
Figure 8	Bourke Road shared pathway (view south of Powell Street).....	12
Figure 9	Proposed site access.....	13
Figure 10	Vehicle swept paths – Young Street access point.....	14
Figure 11	Existing and potential future pedestrian connections.....	15
Figure 12	Bicycle parking and end of trip facilities.....	16
Figure 13	The four components of travel demand management.....	17
Figure 14	Swept path analysis – loading dock.....	19
Figure 15	Typical route and travel time to off-site open space.....	22
Figure 16	Arrival directions to site.....	25
Figure 17	Departure directions from site.....	25
Figure 18	SIDRA network layout.....	26
Figure 19	Intersection modelling results – AM peak weekday hour.....	28
Figure 20	Intersection modelling results – PM weekday peak hour.....	28

## Tables

Table 1	Existing bus routes.....	7
Table 2	Forecast traffic movements.....	24
Table 3	Level of service grades / description.....	27
Table 4	Preliminary capacity assessment of drop off area.....	30

# 1 Introduction

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## 1.1 Background

This transport impact assessment is submitted to the Council of the City of Sydney (**Council**) to support a request for a Planning Proposal relating to land at 242-258 Young Street, Waterloo. The Planning Justification Report prepared by Ethos Urban outlines the proposed amendments to the Sydney Local Environmental Plan (Sydney LEP) 2012.

The proposed amendments are seeking principally to facilitate the delivery of a new independent K-12 vertical school, catering for approximately 800 students. The amendments sought to the Sydney LEP 2012 will encourage and facilitate the redevelopment of the site by allowing for:

- an increased maximum Floor Space Ratio (FSR)
- an increased maximum Building Height.

Supporting the amendments to the Sydney LEP 2012 is an amendment to the Sydney DCP 2012 which includes site-specific controls. For assessment purposes, the Planning Proposal is supported by a concept scheme prepared by Plus Architecture that facilitates the following:

- A new 6 storey vertical school consisting of:
  - 45 GLS, 13 specialist / classrooms
  - A multi-purpose hall / auditorium
  - A library
  - A canteen
  - Administration, lobby and circulation spaces
  - An active green roof
  - A basement including 55 car parking spaces and end-of-trip facilities
- The incorporation of the existing film school within the new vertical school building
- A total of approximately 13,543m<sup>2</sup> of gross floor area which equates to a floor space ratio of 2.94:1. The gross floor area comprises approximately:
  - 10,608m<sup>2</sup> education floor area
  - 2,935m<sup>2</sup> commercial (film school) floor area
- Outdoor spaces totalling approximately 4,978m<sup>2</sup>.



## 1.2 Site location

The site is situated on the traditional land of the Gadigal people of the Eora nation, located at 242-258 Young Street, Waterloo within the City of Sydney Local Government Area (LGA). The site is prominently positioned at the junction of Hunter Street, Young Street and Powell Street. It is located 4km south of the Sydney CBD within the Green Square Urban Renewal Area.

The site comprises three lots which are legally described as Lot 1 in DP84655 and Lots A and B in DP 161650. The site's area is 4,611m<sup>2</sup> and is triangular in shape and is bounded by Hunter Street to the west, Young Street to the east and Powell Street to the south. The site has street frontage dimensions of 118m along Hunter Street, 137m along Young Street and 4.3m along Powell Street. The topography of the site generally falls in an east to west direction.

The site and is currently occupied by 2 storey office building and film school. The southern tip of the site is a grass lawn area.

An aerial photo of the site is shown at Figure 1



Figure 1 Site location and local context

Source: Ethos Urban

### 1.3 Report purpose

This report has been prepared to summarise the traffic and transport implications of the Planning Proposal. Specifically the assessment considers the following items:

- Existing transport conditions, including:
  - Surrounding road network
  - Vehicle site access
  - Car parking
  - Loading and servicing arrangements
  - Public transport provision
- Proposed site access arrangements
- Proposed vehicle loading and servicing arrangements
- Proposed parking rates to be adopted as part of a future development application for the site
- Additional traffic movements resulting from the Planning Proposal and impacts to the adjacent road network
- Public transport, walking and cycling measures



## 2 Existing Transport Conditions

### 2.1 Surrounding road network

To manage the extensive network of roads for which councils are responsible under the Roads Act 1993, Transport for NSW (TfNSW) in partnership with local government established an administrative framework of *State*, *Regional*, and *Local Road* categories. State Roads are managed and financed by TfNSW and Regional and Local Roads are managed and financed by councils.

Regional Roads perform an intermediate function between the main arterial network of State Roads and council controlled Local Roads. Due to their network significance TfNSW provides financial assistance to councils for the management of their Regional Roads. Key State and Regional roads which provide access to the site are illustrated in Figure 2 below, which demonstrates the site is very well connected to the surrounding road network.

The site is primarily serviced by the State Roads including McEvoy Street, Bourke Street and Lachlan Street, as well as Regional Roads such as Bourke Street and Elizabeth Street. The site is also serviced by local roads managed by Council including direct frontage to Young Street and Hunter Street.



Figure 2 Existing road network

## 2.2 Existing site access points

As illustrated in Figure 3 there are six existing points of vehicular access to the site – four driveways on Young Street and two driveways on Hunter Street. These driveways vary between 4m and 9m in width and impact the pedestrian environment in the vicinity of the site. The driveways also limit the ability to provide on-street car parking adjacent to the site.

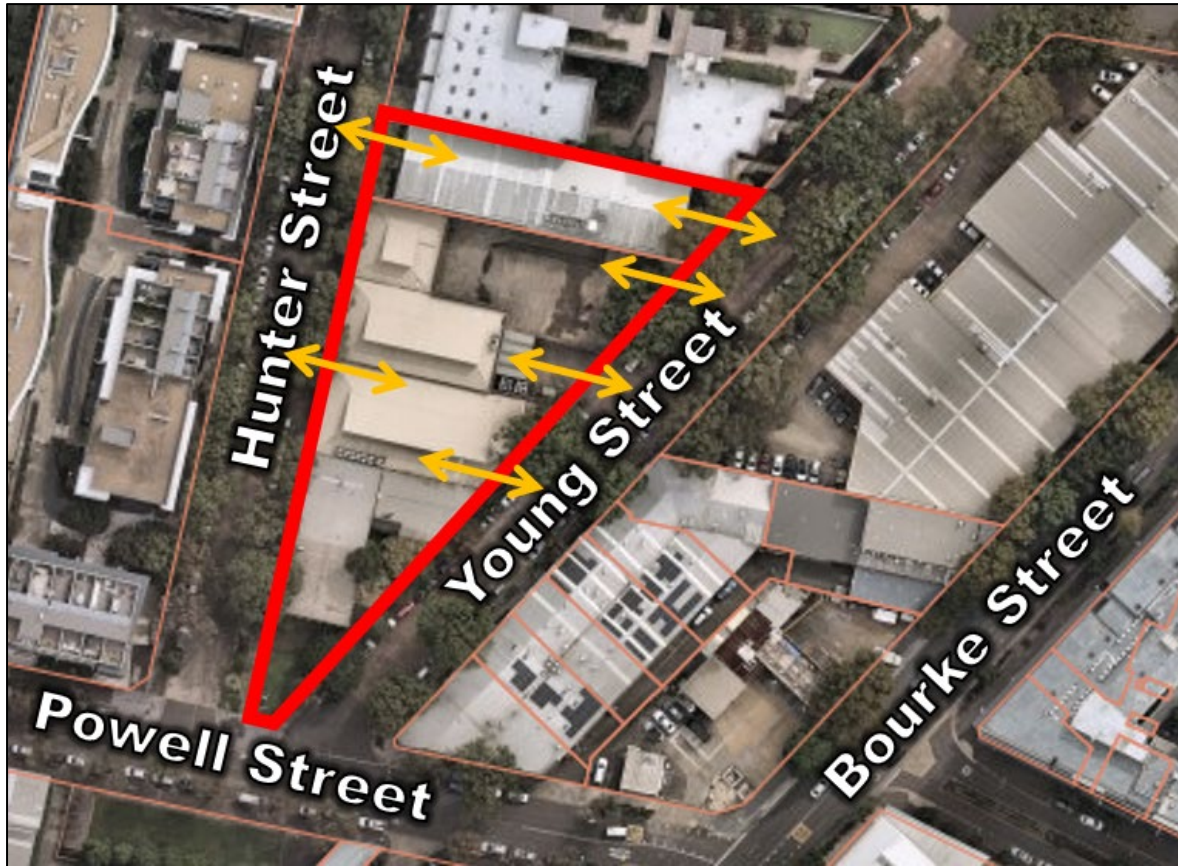


Figure 3 Existing vehicular site access points



## 2.3 Public transport

The site has access to a number of nearby public transport network as illustrated in Figure 4 below.



Figure 4 Public transport access

Green Square railway station located approximately 800m from the site. Green Square is serviced by the T8 (Airport and South) line which provides direct access to the Sydney CBD, Sydney Airport, Revesby and Glenfield, Campbelltown and Macarthur. Between 6am and 10pm on weekdays train services operate every 5 to 7 minutes in each direction, with frequencies increasing to every 15 minutes outside of this time period.

A number of bus services also operate from the bus stops located along the streets within the site immediate vicinity. The closest bus stop is located immediately adjacent to the site on Bourke Street which is served by frequent bus services. A summary of these bus services is provided in Table 1 below.

Table 1 Existing bus routes

Route Number	Route Description	Weekday Frequency	
		Peak	Off-peak
301	Eastgardens to Redfern via Mascot	30 minutes	30 minutes
302	Eastgardens to Redfern via Kingsford	No service	1 hour
303	Sans Souci to Redfern via Mascot	15-30 minutes	30 minutes- 1 hour
304	Rosebery to City Circular Quay via Zetland	5-15 minutes	15 minutes
306	Redfern to Mascot Station	10 minutes	20 minutes
343	Kingsford to Chatswood	3-5 minutes	10 minutes

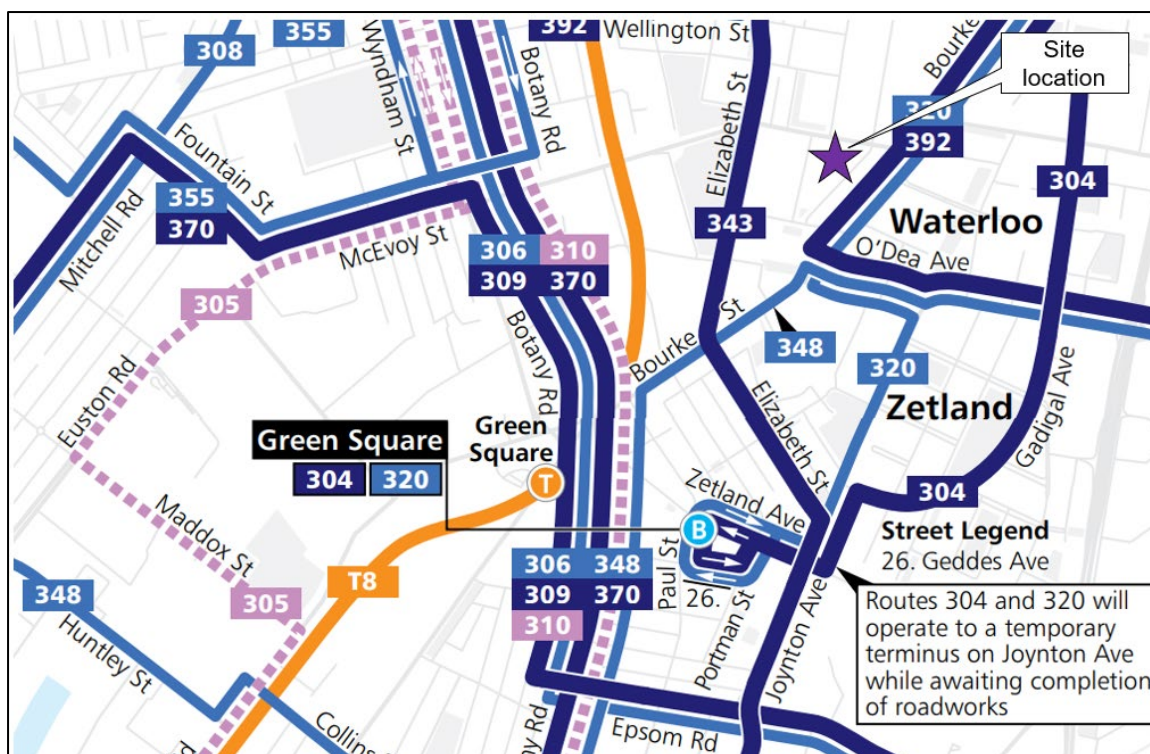


Figure 5 Nearby bus routes



Sydney Metro is a major public transport infrastructure project currently in the construction phase within proximity of the subject site. The Sydney Metro City and Southwest metro line (currently under construction) will connect to the recently opened Sydney Metro Northwest line at Chatswood station and provide significantly improved connectivity from the southwest and Sydney CBD to Chatswood and the northwest.

Waterloo Metro Station is one of the new stations of Sydney Metro City & Southwest line. It is bounded by Botany Road and Cope Street, Raglan Street and Wellington Street. This new station will be located approximately 1km west of the subject site which is within viable walking distance for residents, visitors and staff to mass transit.

The expansion of the Sydney Metro network will further improve public transport accessibility to the site.

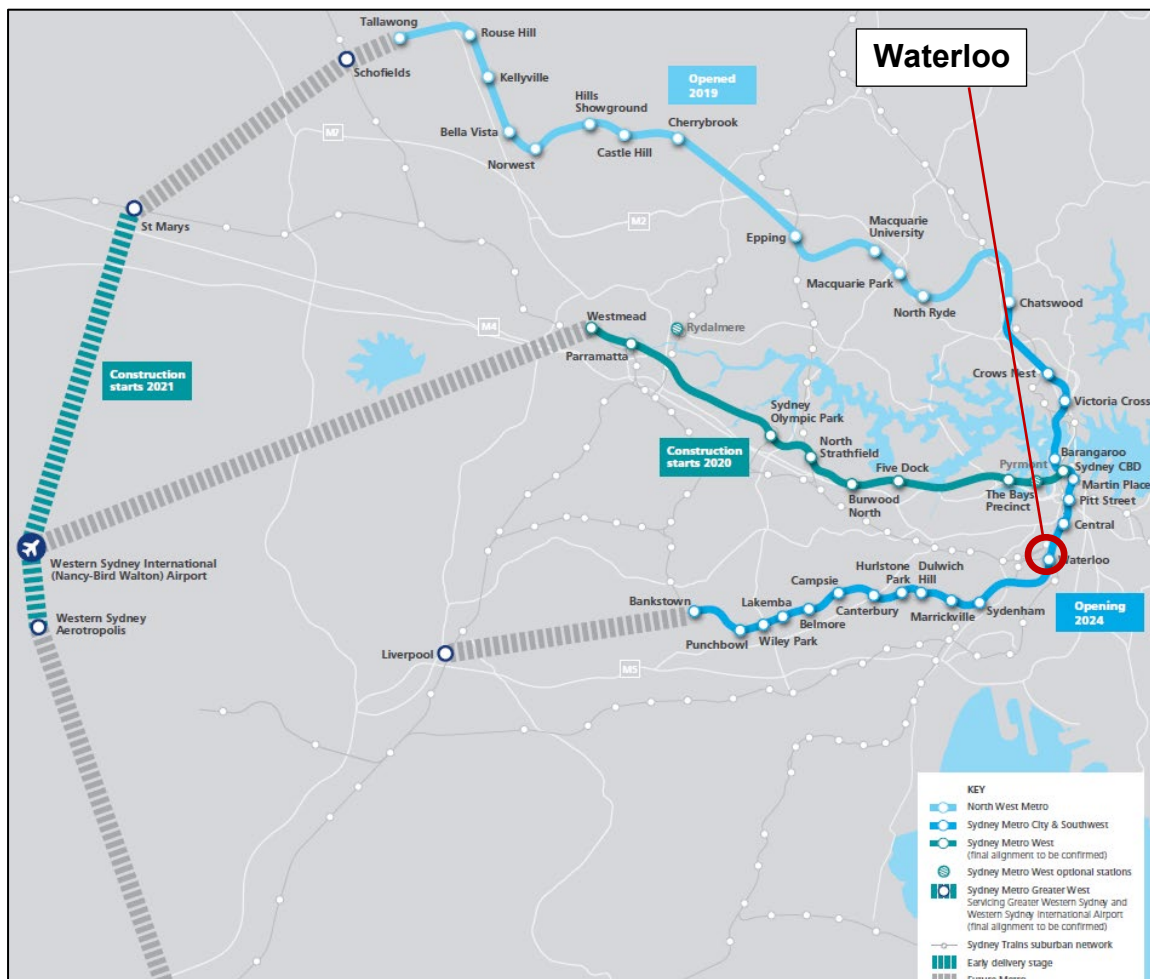


Figure 6 Sydney Metro network

Source: Transport for NSW



## 2.4 Public transport accessibility

A key indicator of the level of public transport accessibility a site contains is the number of locations accessible within a 30 minute public transport catchment. A key objective of the Greater Sydney Commission's Greater Sydney Region Plan is to deliver a 30-minute city where jobs, services and quality public transport spaces are in easy reach of residences.

As illustrated in Figure 6 a number of key employment centres across Sydney can be reached within 30 minutes public transport travel time of the site, including Central / Redfern, Sydney CBD, North Sydney CBD, Burwood, Mascot and Kogarah. The highly accessible nature of the site will facilitate the use of public transport by future users of the site.

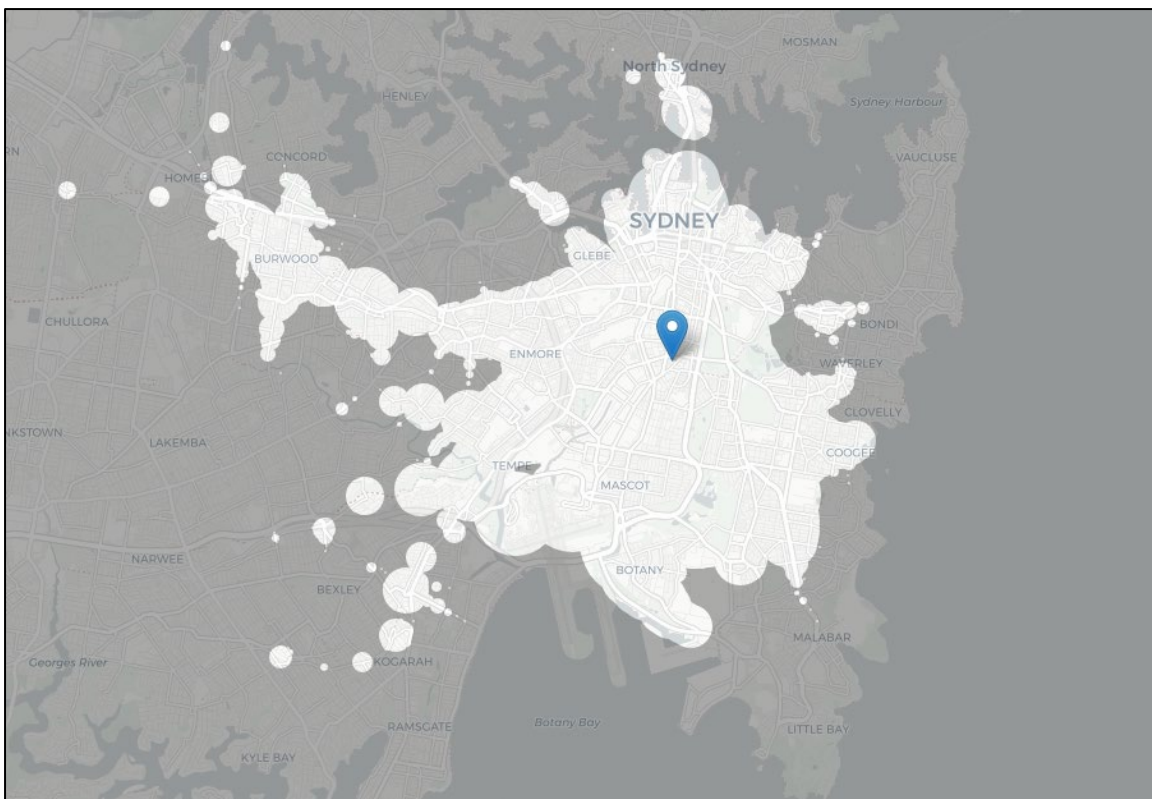


Figure 7 30 minute public transport catchment from site

Source: <https://www.mapnificent.net/sydney>



## 2.5 Pedestrian and cycling network

The pedestrian environment in the vicinity of the site is strong, with pedestrian footpaths are provided on both sides of all surrounding streets. Controlled pedestrian crossings are provided on all legs at the following signalised intersections:

- Bourke Street with Danks Street
- Bourke Street with Potter Street
- Bourke Street with Lachlan Street, and
- Bourke Street with McEvoy Street.

An extensive cycleway network is available in the immediate vicinity of the site as shown in Figure 7. An off-road shared path is provided along Bourke Street near the site (see Figure 8). In addition, an off-road separated cycleway is also provided along Bourke Street north of Phillip Street, which provides a high quality cycleway connection through to the Sydney CBD. A similar facility is also provided along George Street to the west of the site.

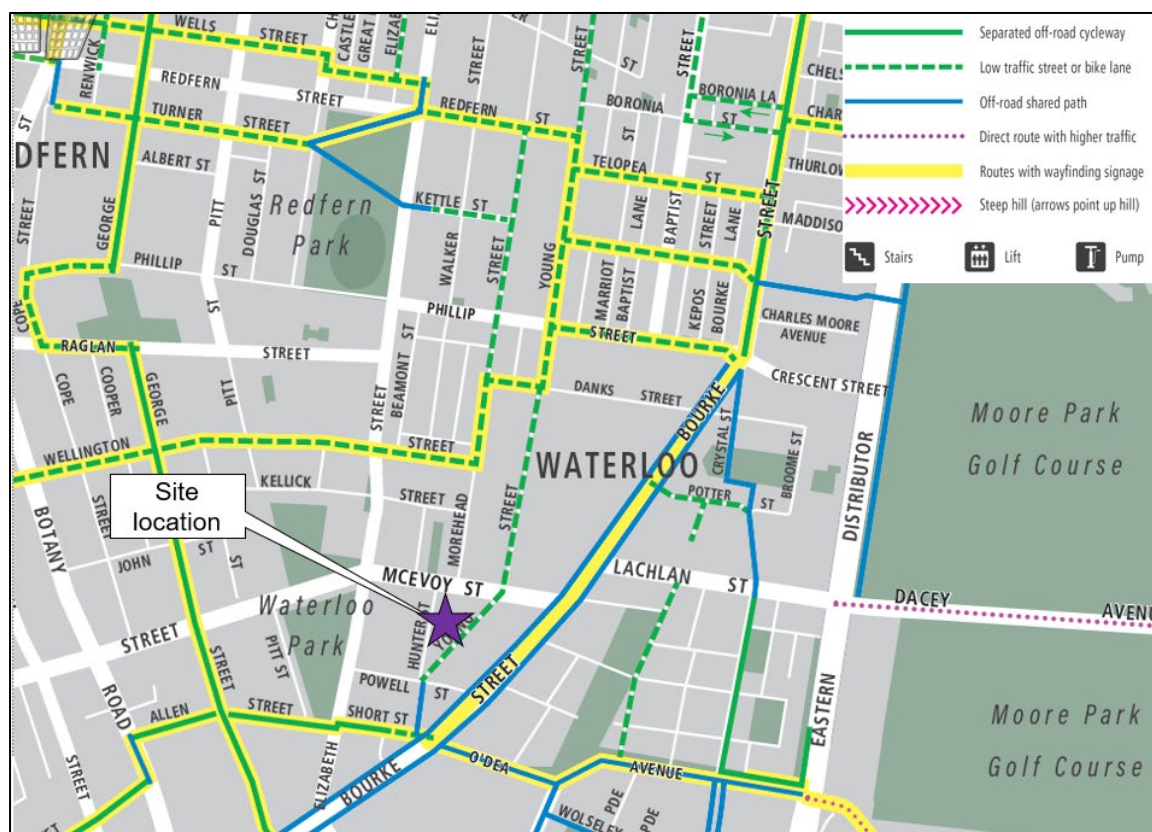


Figure 8 Existing cycling network



Figure 9 Bourke Road shared pathway (view south of Powell Street)



### 3 Transport and Access Strategy

#### 3.1 Site access strategy

The reference scheme developed for the purposes of the Planning Proposal envisages the following access arrangements as indicated in Figure 9.

- Access to an on-site car parking area via Young Street which will provide access for cars and service vehicles.
- A drop off and pick up area for students along Young Street fronting the site, with this area located away from the future Woolworths driveway on the other side of Young Street. Indicatively this area may accommodate approximately 6 – 8 cars at any one time. The drop off / pick up area has been located away from the future Woolworths driveway so that vehicles using this zone will not conflict with drivers entering/exiting the Woolworths car park.
- A bus drop off and pick up zone on Hunter Street fronting the site.

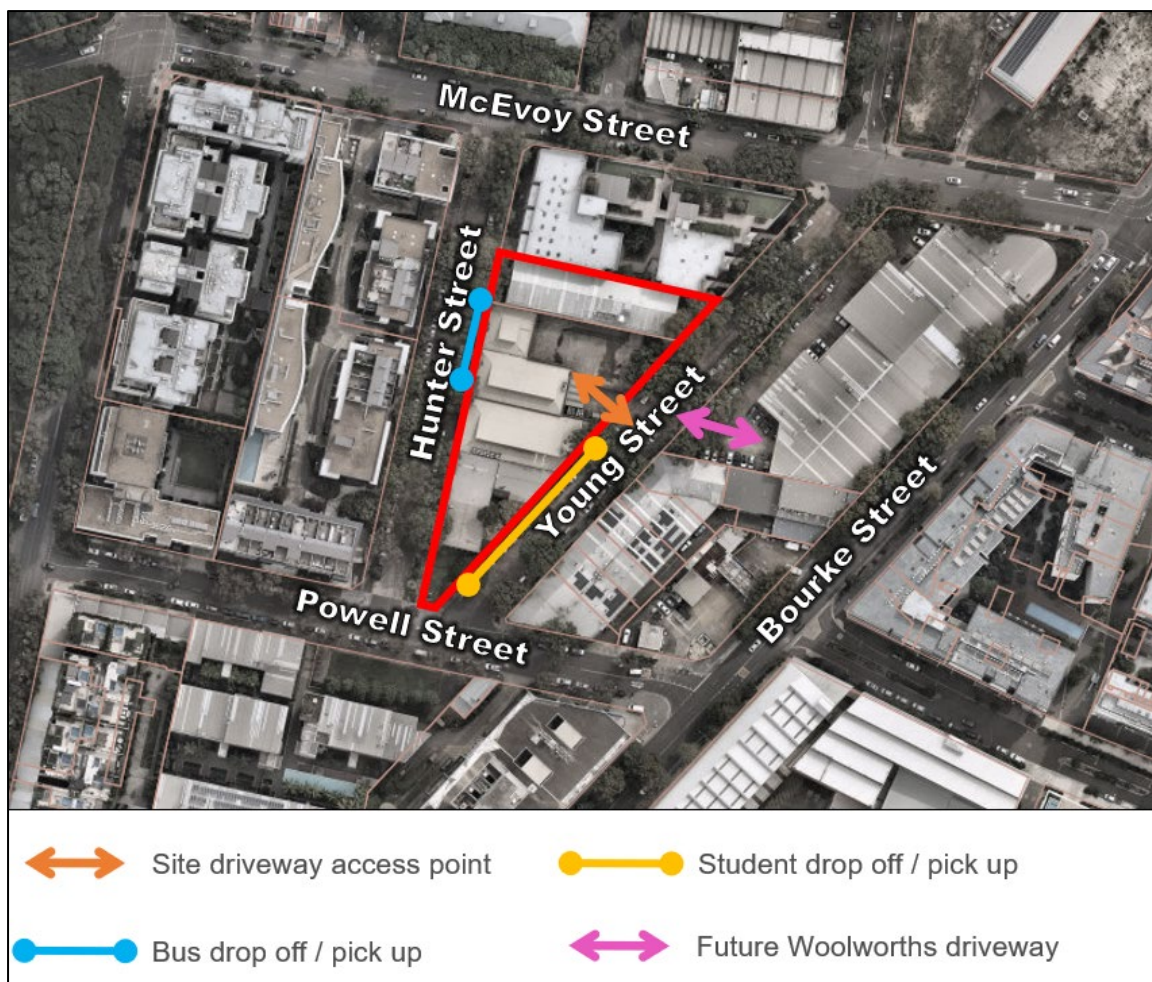


Figure 10 Proposed site access

As previously noted in Section 2.2 of this document the site currently contains six vehicular points of access across Young Street and Hunter Street – impacting the pedestrian and on-street parking environment. The proposal reduces the number of driveways fronting the site from six down to one – providing for a significantly improved environment for pedestrians and facilitating the introduction of additional on-street car parking spaces.

The site access driveway on Young Street will allow for the simultaneous entry and exit of a B85 and B99 vehicle as indicated in Figure 10 below. The reference design has located the proposed driveway in a location consistent with that in place for the current site.

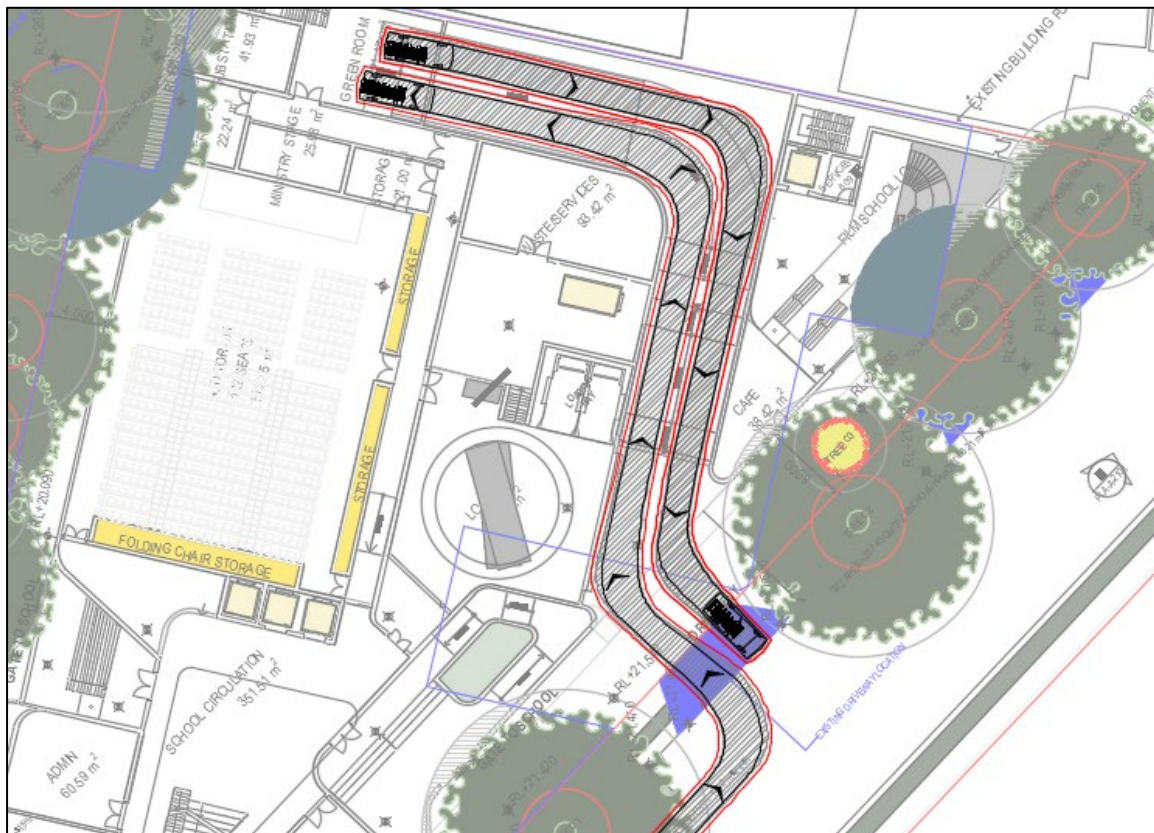


Figure 11 Vehicle swept paths – Young Street access point



### 3.2 Pedestrian connections

As indicated in Figure 11 the site benefits from a number of existing pedestrian crossing points at signalised intersections. Students arriving to the site from the west, north and east are generally well serviced by these crossing points.

With the improved permeability to be provided via the future Woolworths development at 923-935 Bourke Street, including new through site links, a new pedestrian crossing of Young Street would be delivered by the project across Young Street. This crossing point will generally align with the through-site link to be delivered by Woolworths. An additional pedestrian crossing will be delivered by the project across Powell Street at Young Street to support pedestrian movements from the south.

Subject to a future DA for the site, there will be the potential for footpath widening on Young Street and Hunter Street adjacent to the site. This footpath widening will provide additional space for pedestrians to move and store – particularly relevant to support safe and efficient drop off / pick up activity and travel by school bus.



Figure 12 Existing and potential future pedestrian connections

### 3.3 Bicycle parking

Bicycle parking and end of trip facilities will be provided as part of any future Development Application for the site. The reference scheme prepared for the Planning Proposal has located these facilities in the basement of the building as indicated in Figure 12.

Access for cyclists in the reference scheme to the end of trip area is via the passenger lifts accessed either off on Young Street or Hunter Street. As part future design development, and prior to the lodgement of the DA, opportunities to improve access for cyclists will be considered including potentially via the introduction of a dedicated bike ramp (or similar) accessed at ground level.

The final bicycle parking requirements and access arrangements for end of trip areas (including access from the street network) will be confirmed at the Development Application (DA) stage of the project.



Figure 13 Bicycle parking and end of trip facilities

### 3.4 Sustainable transport measures

Sustainable transport measures involve the application of policies, objectives and targets to positively influence travel behaviour through the uptake of sustainable transport modes – public transport, walking and cycling. Sustainable transport measures have proven effective in limiting car based travel and reducing traffic congestion to facilitate new development opportunities in urban areas.

Transport for NSW has recently created a Travel Choices team to help develop travel action plans for businesses. As part of this program, the framework proposes to assess travel demand management is a series of four ‘R’s as shown in Figure 13:

- Remode (consideration of travel via alternative modes)
- Retime (consideration of travel at alternative times)
- Reroute (using less congested routes to travel to a destination)
- Reduce (minimise the amount of travel required)



Figure 14 The four components of travel demand management



The following opportunities to reduce private vehicle travel and promote the use of sustainable transport modes to the future school have been identified at this preliminary stage of the project. These measures, along with others that align with the principles of sustainable travel, will be explored in further detail with the future operator of the school as the project develops.

- Appointment of a school travel coordinator to manage school travel activities and review the effectiveness of the implemented measures
- Preparation of a transport access guide (TAG) to be displayed on the school's website capturing sustainable ways to travel to school. The TAG would also be provided to all students when they first start at the school.
- Cycle Provisional Training—both for staff and students, and potentially parents covering the local area.
- Guided cycle/pedestrians groups “Cycle Trains / Walking School Bus”— adults guides a convoy of pupils on a safe route
- Bike check up—sponsored or subsidised bicycle maintenance offered to students
- Targeted educational program—for parents and students to encourage use of alternative transport modes as well as the health benefits
- Encouragement and rewards program – based on how frequently students walk / bike to school
- Student involvement – e.g. students prepare ‘healthy travel to school’ logo as part of their class room activities or steps per day challenges
- Encouragement of car pooling by staff
- Staggered start and finish times for different year groups so as to distribute travel demand across a longer period of time and reduce the extent of congestion experienced at pick up and drop off times.

### 3.5 Loading dock

The reference scheme includes an on-site loading dock which can accommodate a Medium Rigid Vehicle (MRV) which is 8.8m in length. This loading provision is considered suitable to accommodate the needs of the site based on the development yields associated with the reference scheme.

The loading dock is located on the ground floor with a 10m diameter turntable provided to facilitate the entry and exit of vehicles from the site in a forwards direction. All loading / unloading is to occur on-site and not in public streets. The loading dock has been designed in accordance with the requirements outlined in the relevant Australian Standard (AS2890.2, 2018). The detailed design of the loading dock will be carried out at the Development Application stage of the project.

As indicated in Figure 14 below heavy vehicles (including MRVs) have the ability to safely enter and exit the loading dock in a forwards direction without impacting the opposing travel lane on Young Street.

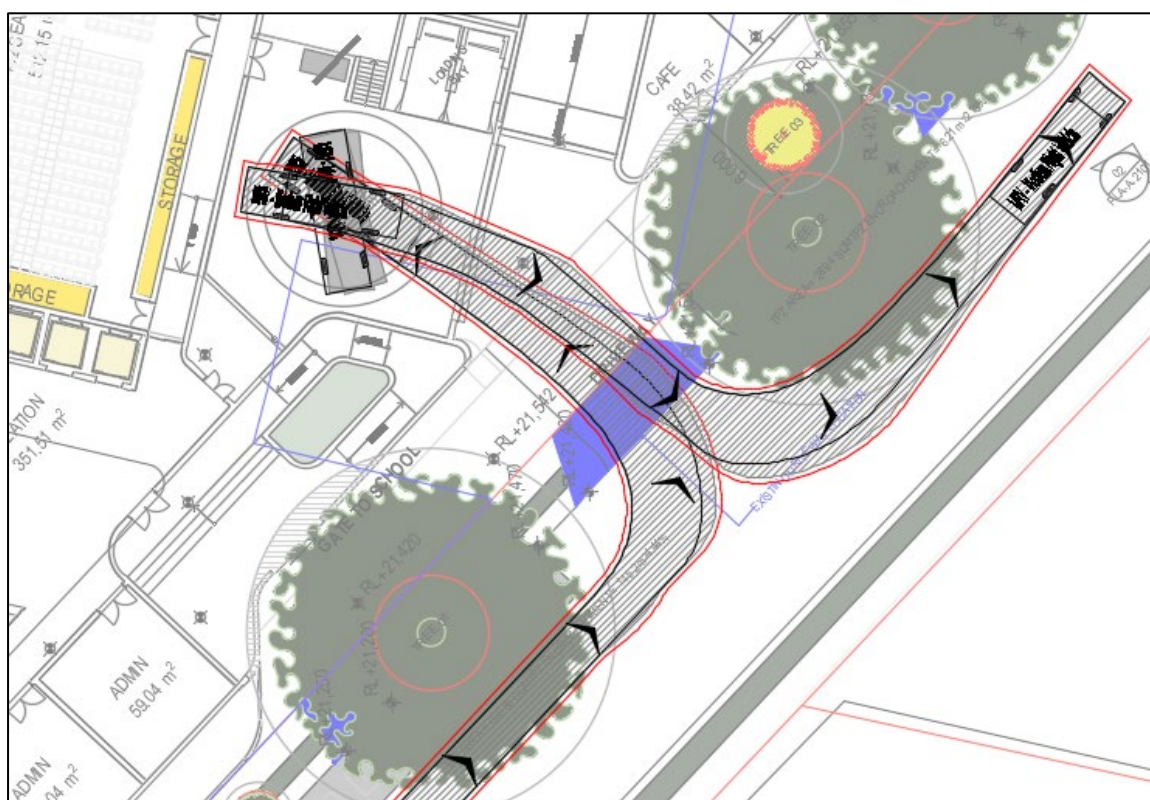


Figure 15 Swept path analysis – loading dock

### 3.6 On-street car parking impacts

The reduction of the number of driveways fronting the site from six down to one will facilitate the introduction of additional on-street car parking – both along Hunter Street and Young Street. This will provide a positive outcome for users of the surrounding area.

The reference scheme prepared for the Planning Proposal envisages a student drop off / pick up zone on Young Street and bus zone on Hunter Street. During school drop off and pick up (indicatively 8am-9am and 2.30pm-3.30pm) the on-street parking along Young Street would be reserved for this specific purpose. Similarly during school hours a bus zone would be in place adjacent to the site on Hunter Street – temporarily impacting some existing on-street parking spaces.

The impacts of this temporary change of parking restrictions is considered acceptable given the following:

- The project will create opportunities for additional on-street parking along both Young Street and Hunter Street through the removal of existing driveway crossovers;
- The drop off / pick up zone and bus zones would only be in place for certain periods of the day, and outside of school hours and on weekends the general public will continue to be able to utilise these areas for on-street car parking; and
- The existing on-street parking is untimed and typically utilised by workers of the existing building. The on-street parking is not subject to any resident parking scheme or time restrictions relied upon by visitors to the area.

### 3.7 On-site car parking provision

The reference scheme includes a basement car parking area with approximately 55 car parking spaces. It should be noted that the reference scheme is conceptual in nature and further investigations will need to be undertaken at subsequent stages to confirm the final parking number and layout. The final car parking requirements and provision for the site will be confirmed at the Development Application (DA) stage of the project.

Maximum car parking allowances for the various use of the site are summarised in following sections of this document:

### 3.7.1 Commercial car parking

For buildings on land in Category F<sup>1</sup>, with the commercial component having a floor space ratio of no more than 1.5:1, the Sydney LEP specifies a maximum car parking rate of 1 space per 75m<sup>2</sup>. Based on the 2,935m<sup>2</sup> of commercial GFA provided in the reference scheme up to 39 car parking spaces could be delivered on the site.

### 3.7.2 School car parking

The City of Sydney LEP does not provide a car parking rate for educational establishments and therefore a merits based parking assessment should be undertaken. The 55 car parking spaces proposed as part of the reference scheme is considered suitable and meets the objectives of reducing car dependency and supporting the use of sustainable forms of transport to the site.

## 3.8 Car park design

As part of the reference scheme developed for the Planning Proposal a basement car park has been designed to facilitate the future development. The car park and associated elements such as car parking space dimensions, circulation aisles and ramp would be designed in accordance with the relevant Australian Standard for car parking facilities, namely AS2890.1: 2004 and AS2890.6:2009.

Car parking spaces have been designed to comply with a Class 2 car park facility as specified in the Australian Standard (generally medium turnover long term parking) with minimum 2.5m wide spaces and aisle widths of 5.8m minimum. The detailed design of the car park will be carried out at the Development Application stage of the project.

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<sup>1</sup> Based on Public Transport Accessibility Level Map

### 3.9 Off-site student travel to open space

Given the project is at a very early stage only preliminary investigations have been undertaken in relation to potential open space areas for use of the student population. Turruwul Park in Rosebery has been identified as suitable and has availability Monday to Friday 8:00am-5:00pm. As indicated in Figure 15 travel time to Turruwul Park from the site is between 5 and 14 minutes in the afternoon peak hour. Typically students will travel to/from the open space areas in the middle the day when traffic volumes are lower compared to the commuter peak hours which will facilitate shorter travel times.

Further detailed planning around travel to/from open space areas will be undertaken in subsequent stages of the project.

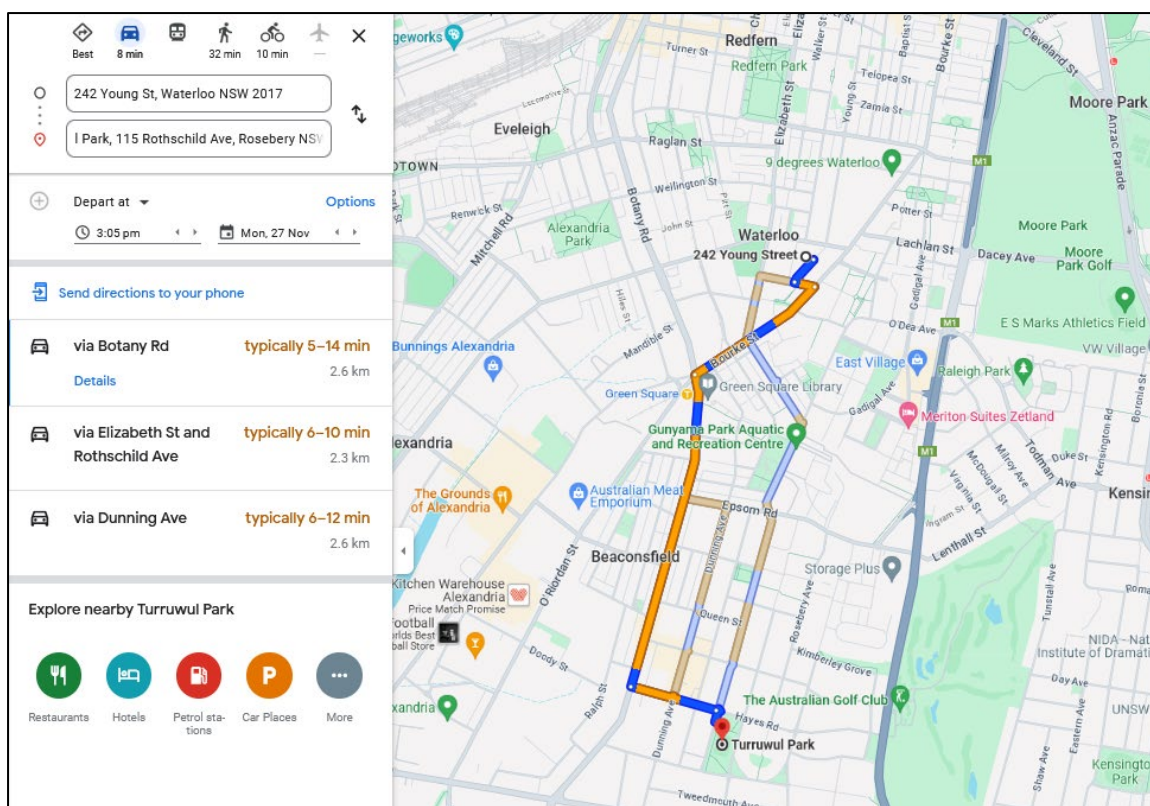


Figure 16 Typical route and travel time to off-site open space

Source: Google maps



## 4 Traffic Assessment

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### 4.1 Baseline traffic assumptions

To inform the traffic assessment undertaken for the Planning Proposal reference is made to the detailed traffic modelling undertaken for the adjacent Woolworths Planning Proposal (PP-2021-6962) at 923 – 935 Bourke Street, Waterloo. The modelling undertaken for this proposal considered:

- Existing performance of intersections surrounding the site, including:
  - Bourke Street / Lachlan Street
  - Bourke Street / McEvoy Street
  - Bourke Street / Powell Street
  - Powell Street / Young Street
  - McEvoy Street / Young Street
- Traffic performance with the Woolworths proposal in place

The traffic modelling undertaken for the Woolworths development was subject to detailed discussions with both TfNSW and Council and ultimately deemed to be satisfactory to determine the impacts of the proposal. Given the proximity of the Woolworths development to the subject site and the same key intersections that would be impacted it is appropriate to use the modelling for the Woolworths project as an appropriate baseline to understand the traffic impacts of the proposal for the site at 242-258 Young Street.

### 4.2 Travel demand and vehicle trips

This section contains details about the school's expected traffic demand. In determining projected mode shares for a new site it is industry best practice to review existing travel behaviours of users in similar developments. The assumptions were developed based on this best practice approach which considered traffic survey outcomes from Inner Sydney High School, Sydney Secondary College & Bourke Street Public School.

The traffic generation from the school has been calculated based on the following assumptions:

- Up to 800 students at the school, comprising of 250 students in the primary school and 550 students in the senior school.
- 75% of students arrive during the morning road network peak hour (8am – 9am) based on surveys of other schools, taking into consideration factors such as absenteeism, out of school hours care and other factors.
- 10% of students depart during the afternoon road network peak hour (5pm – 6pm)
- Mode share for student drop off / pick up:

- 35% for the primary school which is slightly above the surveyed rate for Bourke Street public school as well as consistent with the rate observed at Meadowbank Education Campus (primary school component)
- 20% for the high school, greater than the 15% observed at Sydney Secondary College and adopted for Inner Sydney High School

The above mode share assumptions should be considered in the context of the highly accessible nature of the site located adjacent to high density residential developments within Waterloo and Green Square, as well as the imminent opening of the Waterloo metro station.

- Every vehicle arriving to the site counts as two ‘trips’ – with one inbound trip and one outbound trip.
- Average of 1.6 students per car which is the standard vehicle occupancy rate used by Schools Infrastructure when preparing transport assessments for new schools.

Based on these assumptions the traffic generation potential from the school can be summarised in Figure 11. This indicates that the school may generate in the order of 90 to 100 car trips to the site in the morning peak hour, with only 10-15 vehicles in the afternoon peak hour.

Table 2 Forecast traffic movements

Year Group	Car mode share	Student numbers	Car occupancy (students per car)	Students arriving / leaving in peak hour		Cars in peak hour	
				AM peak hour*	PM peak hour**	AM peak hour*	PM peak hour**
Year K-6	35%	250	93	75%	10%	41	5
Year 7-12	20%	550		75%	10%	52	7
<b>Total</b>						<b>93</b>	<b>12</b>

\* AM road network peak hour 8am-9am

\*\* PM road network peak hour 5pm – 6pm

As the film school use of the site provides for a ‘like for like’ replacement it has been assumed no additional traffic would be generated from this use relative to existing conditions.

### 4.3 Traffic distribution

The forecast arrival and departure directions for cars accessing the site are shown in Figure 16 (arrival directions) and Figure 17 (departure directions). This traffic distribution is generally consistent with the assumptions adopted for the



neighbouring Woolworths site, however takes into consideration the likely direction of travel to access or leave drop off / pick up zone on the western kerb of Young Street.



Figure 17 Arrival directions to site



Figure 18 Departure directions from site

#### 4.4 Traffic modelling

The traffic modelling undertaken to support the proposal has been conducted using the TfNSW approved 'SIDRA Network' modelling package. SIDRA Network, unlike SIDRA Intersection, considers the operation of intersections in a coordinated manner including downstream and upstream queuing effects. SIDRA Network also has the ability to consider the interaction of traffic signal phasing / timing at adjoining intersections.

A key benefit of using SIDRA Network, as is now commonly recommended by TfNSW, is that any vehicle queues arising at a site are considered in the model and will impact the operation of the adjacent intersections. As can be seen in the figure below, the traffic modelling has considered the operation of key intersections close to the site in a linked manner.

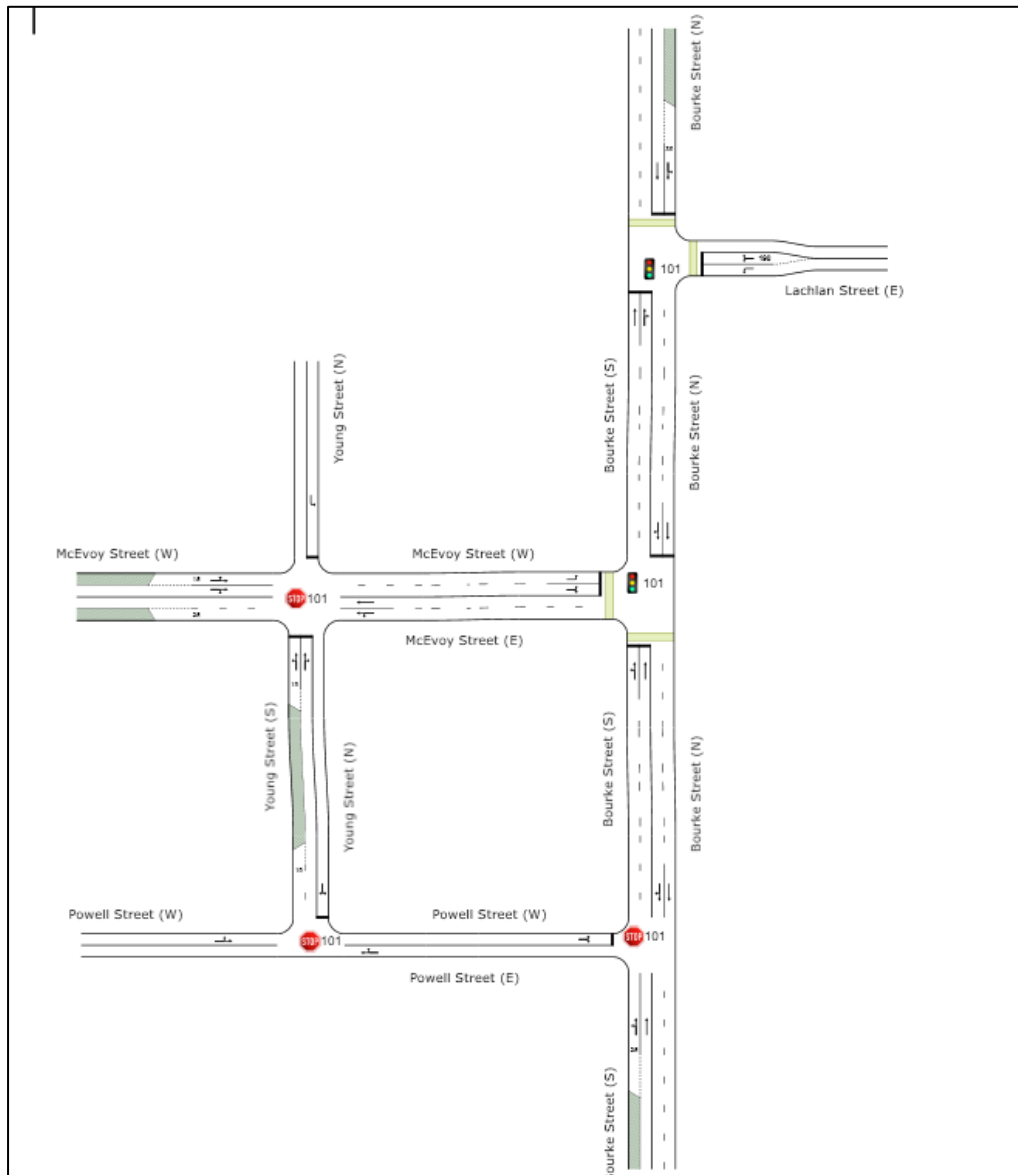


Figure 19 SIDRA network layout

The traffic modelling metric used to analyse the performance of the intersections is intersection Level of Service (LOS). Level of Service is a measure that uses the average delay experienced by vehicles to categorically assign each approach and movement with a qualitative ordinal grade (A through F, with A being the best and F being the worst). RMS Traffic Modelling Guidelines indicate the average delay relating to each grade, this is outlined in Table 3. In typical urban environments it is typical for intersections to operate at Level of Service D or E and still remain within acceptable performance levels.

Table 3 Level of service grades / description

Level of service grade	Average delay (seconds)	Description
A	Less than 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. At signals, incidents will cause excessive delays. Roundabouts require other control mode
F	Greater than 71	Unsatisfactory with excessive queuing

The modelling results indicate that the proposal is not anticipated to significantly impact the surrounding road network. Intersection level of service remains unchanged for all sites when compared to the ‘future base’ scenario which considers both background traffic growth as well as traffic associated with the future Woolworths development. The modelling indicates that all intersections would operate at Level of Service D or below which is acceptable in urban environments. The modelling also demonstrates that intersections will generally perform at Level of Service consistent with that currently experienced.

It is also worthwhile noting that a number of vehicle trips associated with morning drop offs would typically be ‘pass by’ trips – this is vehicles already on the road network. This concept of linked trips is noted in the *RMS Guide to Traffic Generating Developments* and would involve parents dropping off their children on the way to work or other activities. No allowance for pass by trips has been made in the traffic modelling and therefore the outputs reflect a conservative scenario where all vehicles travelling to the site are ‘new’ trips on the network.

It should also be recognised that the adjoining Woolworths development will generate the majority of it’s traffic after 5pm on weekdays and on weekends – outside of the operating times of the school. Therefore the busiest traffic usage times of the respective sites will not overlap – therefore minimising the impacts on the surrounding road network.



The results of the traffic modelling are illustrated in Figure 19 (AM peak hour), and Figure 20 (PM peak hour). Detailed traffic modelling outputs are provided in Appendix A of this document.

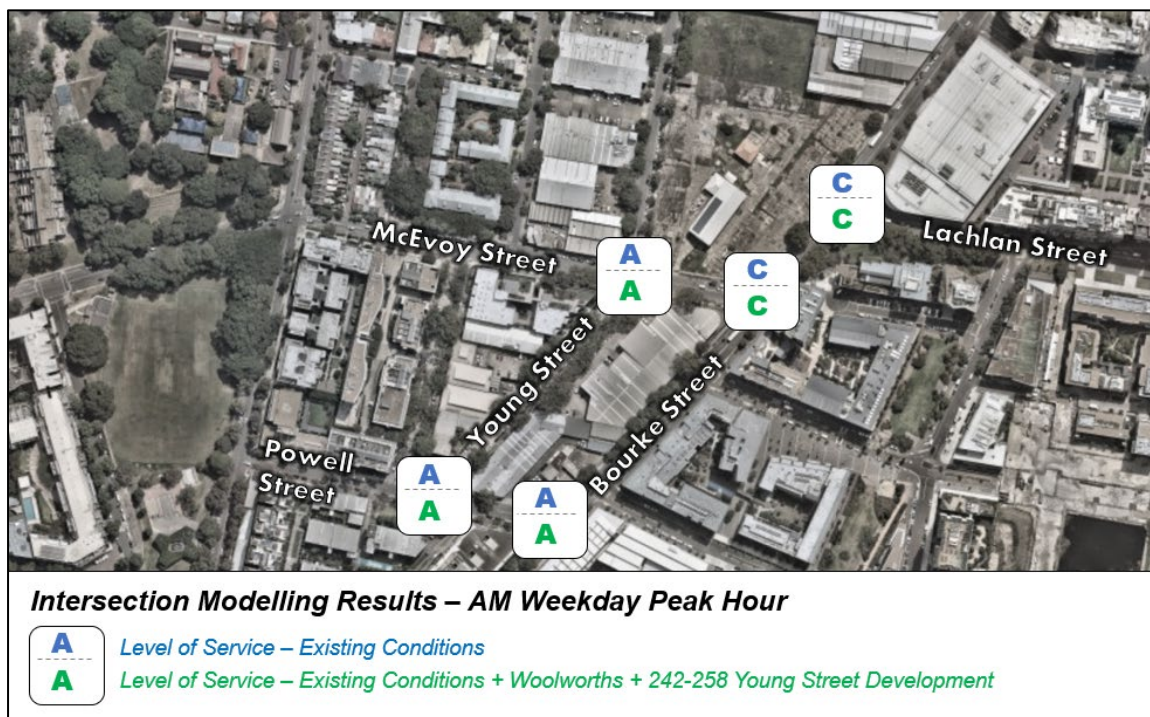


Figure 20 Intersection modelling results – AM peak weekday hour

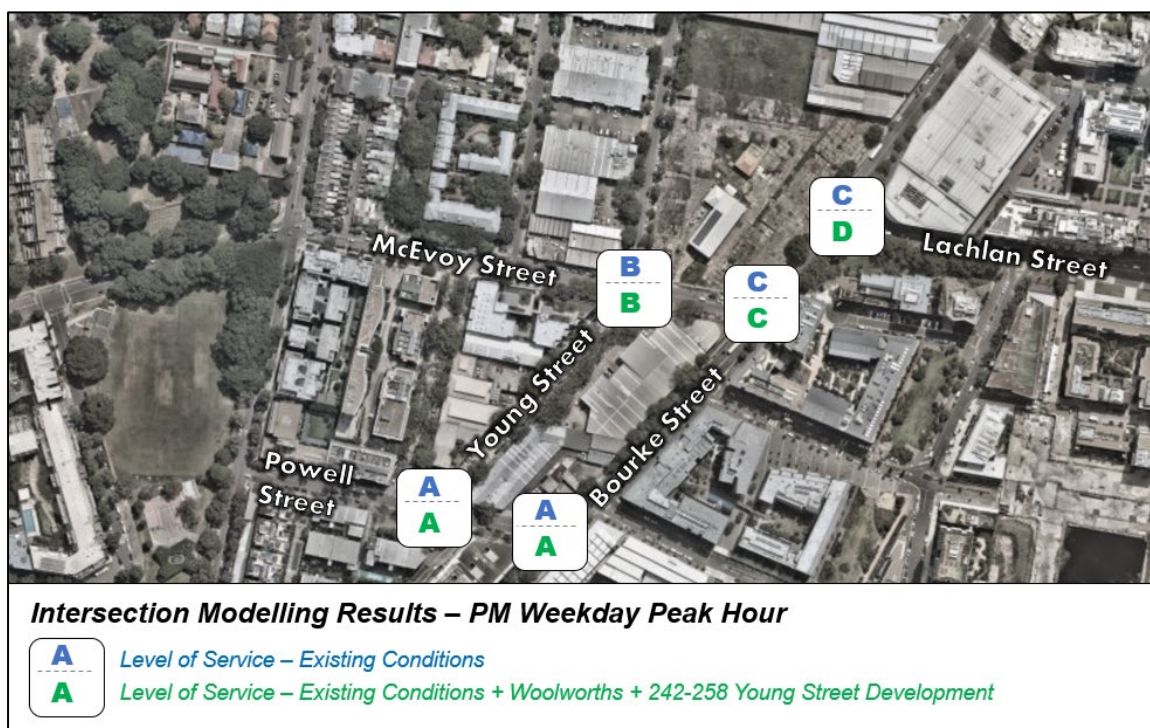


Figure 21 Intersection modelling results – PM weekday peak hour



In response to TfNSW comments regarding traffic and road safety impacts an analysis has been undertaken to understand expected queue lengths on McEvoy Street at Bourke Street. The typical queue lengths during the AM and PM peak hours are 74m and 65m respectively which is less than the distance to the adjacent intersection at Young Street as noted in Figure 21. It should also be noted that the project would generate relatively low right turn demands from Young Street into McEvoy Street of approximately 30 vehicles in the AM peak hour and 5 vehicles in the PM peak hour.

The SIDRA Network traffic modelling has considered any upstream and downstream queueing implications and confirmed that the Young Street / McEvoy Street can continue to operate in a safe manner with the proposal. Delays for vehicles turning right from Young Street into McEvoy Street are 30 seconds or less (Level of Service C) which is an acceptable level of performance. Should vehicle queueing extend on McEvoy Street from the Bourke Street traffic lights past Young Street, vehicles wanting to turn right out of Young Street would be temporarily delayed and be required to wait for the queue to clear before entering McEvoy Street.



Figure 22 Forecast queue lengths on McEvoy Street at Bourke Street

## 4.5 Drop off / pick up capacity

An assessment has been undertaken to consider the suitability of the proposed drop off / pick up area on Young Street to accommodate future demands. The current layout makes provision for approximately 6 vehicle drop off / pick up bays. A preliminary capacity assessment has been undertaken to confirm the suitability of this provision, with relevant assumptions noted in Table 4 below.

Table 4 Preliminary capacity assessment of drop off area

Consideration	Quantum
Number of vehicle arrivals in AM peak hour	93
% of arrivals within a 10 minute period	35%
Number of cars within a 10 minute period	33
Typical dwell time	60 seconds
Pick up / Drop off spaces required	4

This preliminary assessment demonstrates there will be adequate capacity to accommodate all pick up and drop off within the identified kerbside area, even taking a worst case scenario whereby no informal drop off and pick up occurs on surrounding streets. This assessment of the drop off and pick up zone will be finalised as part of the detailed Development Application for the site.

In response to road safety concerns raised by TfNSW in relation to drivers arriving to the site via McEvoy Street and turning right into Young Street, the future operator of the school will actively communicate with parents and carers with regards to safe routes of travel to and from the site. This will include advice for drivers arriving via McEvoy Street to turn right into Pitt Street or George Street rather than relying on Young Street – this will remove any requirement for drivers to undertake u-turns to access the drop off area on Young Street.

## 5 Summary

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This transport assessment report has been undertaken by JMT Consulting to support a Planning Proposal for the site at 242-258 Young Street, Waterloo. Key findings of the transport assessment are as follows:

- Vehicle access to the site would be via a single driveway from Young Street which will accommodate both cars and service vehicles. This would result in a reduction in the number of driveways fronting the site from six down to one – providing for a significantly improved environment for pedestrians and facilitating the introduction of additional on-street car parking spaces.
- The reference scheme makes provision for student drop off and pick up via a kerbside zone on the western side of Young Street, located away from the future Woolworths driveway on the eastern side of Young Street.
- Service vehicle access to an on-site loading dock is to be provided via Young Street, with all trucks entering and exiting the site in a forwards direction.
- Car parking for all uses will be delivered in accordance with the parking rates outlined in the Sydney LEP, with the final number of spaces to be determined at the Development Application stage of the project. The reference scheme includes approximately 55 parking spaces which is below the maximum stipulated in Council's controls.
- Traffic modelling undertaken indicates that the proposal is not anticipated to result in unacceptable traffic impacts on the surrounding road network – with all intersections performing at an acceptable level of service.
- Sustainable transport measures have been suggested to improve the mode share of public transport and active transport. These items should be considered further at subsequent stages of the project.

In the above context, the traffic and transport impacts arising from the proposal are considered acceptable.



## Appendix A: Traffic Modelling Outputs

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# MOVEMENT SUMMARY

 Site: 101 [Bourke / Powell (Site Folder: AM Existing)]

 Network: N102 [Existing AM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Bourke Street (S)														
1	L2	51	2.1	51	2.1	0.140	5.6	LOS A	0.0	0.0	0.00	0.11	0.00	57.9
2	T1	479	4.4	479	4.4	0.140	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.0
Approach		529	4.2	529	4.2	0.140	0.6	NA	0.0	0.0	0.00	0.06	0.00	58.9
North: Bourke Street (N)														
8	T1	655	3.5	655	3.5	0.194	0.3	LOS A	0.2	1.3	0.07	0.03	0.07	59.0
9	R2	36	2.9	36	2.9	0.194	8.9	LOS A	0.2	1.3	0.16	0.07	0.16	53.3
Approach		691	3.5	691	3.5	0.194	0.8	NA	0.2	1.3	0.08	0.03	0.08	58.9
West: Powell Street (W)														
10	L2	15	0.0	15	0.0	0.080	8.7	LOS A	0.1	0.8	0.49	0.94	0.49	19.7
12	R2	28	0.0	28	0.0	0.080	14.4	LOS A	0.1	0.8	0.49	0.94	0.49	43.5
Approach		43	0.0	43	0.0	0.080	12.5	LOS A	0.1	0.8	0.49	0.94	0.49	39.9
All Vehicles		1263	3.7	1263	3.7	0.194	1.1	NA	0.2	1.3	0.06	0.07	0.06	58.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Model\_May24.sip9

# MOVEMENT SUMMARY

Site: 101 [Lachlan / Bourke (Site Folder: AM Existing)]

Network: N102 [Existing AM (Network Folder: General)]

Lachlan / Bourke

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Bourke Street (S)														
2	T1	509	9.3	509	9.3	0.544	20.6	LOS B	8.6	65.0	0.79	0.70	0.79	37.6
3	R2	311	7.8	311	7.8	*0.809	62.2	LOS E	8.7	65.0	1.00	0.88	1.08	18.8
Approach		820	8.7	820	8.7	0.809	36.4	LOS C	8.7	65.0	0.87	0.77	0.90	28.1
East: Lachlan Street (E)														
4	L2	618	6.0	618	6.0	0.796	33.8	LOS C	12.6	92.6	0.85	0.89	0.95	25.8
6	R2	116	3.6	116	3.6	*0.796	49.5	LOS D	9.6	69.8	0.97	0.92	1.13	31.0
Approach		734	5.6	734	5.6	0.796	36.3	LOS C	12.6	92.6	0.87	0.90	0.98	27.2
North: Bourke Street (N)														
7	L2	34	6.3	34	6.3	*0.803	61.2	LOS E	5.1	38.4	1.00	0.96	1.28	29.1
8	T1	262	8.8	262	8.8	0.803	53.9	LOS D	5.5	41.4	0.99	0.96	1.27	21.7
Approach		296	8.5	296	8.5	0.803	54.7	LOS D	5.5	41.4	0.99	0.96	1.27	22.8
All Vehicles		1849	7.5	1849	7.5	0.809	39.3	LOS C	12.6	92.6	0.89	0.85	0.99	26.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
East: Lachlan Street (E)											
P2	Full	62	49.3	LOS E	0.2	0.2	0.95	0.95	75.9	31.9	0.42
North: Bourke Street (N)											
P3	Full	56	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
All Pedestrians		118	49.3	LOS E	0.2	0.2	0.95	0.95	77.2	33.5	0.43

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

Site: 101 [McEvoy / Bourke (Site Folder: AM Existing)]

Network: N102 [Existing AM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Bourke Street (S)														
1	L2	32	3.3	32	3.3	*0.749	45.4	LOS D	7.8	59.3	0.95	0.89	1.05	14.8
2	T1	462	10.0	462	10.0	0.749	38.9	LOS C	7.9	60.3	0.94	0.89	1.05	15.2
Approach		494	9.6	494	9.6	0.749	39.3	LOS C	7.9	60.3	0.94	0.89	1.05	15.2
North: Bourke Street (N)														
8	T1	533	7.7	533	7.7	0.410	11.7	LOS A	8.7	65.0	0.70	0.62	0.70	17.6
9	R2	347	5.5	347	5.5	*0.737	57.6	LOS E	8.9	65.0	1.00	0.87	1.02	4.6
Approach		880	6.8	880	6.8	0.737	29.8	LOS C	8.9	65.0	0.82	0.72	0.82	8.4
West: McEvoy Street (W)														
10	L2	358	7.1	358	7.1	0.750	36.0	LOS C	9.5	70.2	0.88	0.88	0.96	9.3
12	R2	157	7.4	157	7.4	*0.750	56.6	LOS E	6.4	47.6	1.00	0.88	1.13	6.3
Approach		515	7.2	515	7.2	0.750	42.3	LOS C	9.5	70.2	0.91	0.88	1.01	8.1
All Vehicles		1888	7.6	1888	7.6	0.750	35.7	LOS C	9.5	70.2	0.88	0.81	0.93	10.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
South: Bourke Street (S)											
P1	Full	81	49.3	LOS E	0.2	0.2	0.95	0.95	78.7	35.2	0.45
West: McEvoy Street (W)											
P4	Full	46	49.3	LOS E	0.1	0.1	0.95	0.95	78.6	35.2	0.45
All Pedestrians		127	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.



# MOVEMENT SUMMARY

 Site: 101 [McEvoy / Young (Site Folder: AM Existing)]

 Network: N102 [Existing AM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Young Street (S)														
1	L2	19	0.0	19	0.0	0.018	9.1	LOS A	0.0	0.2	0.24	0.86	0.24	48.8
3	R2	4	0.0	4	0.0	0.018	21.6	LOS B	0.0	0.2	0.75	0.96	0.75	23.3
Approach		23	0.0	23	0.0	0.018	11.4	LOS A	0.0	0.2	0.33	0.87	0.33	45.7
East: McEvoy Street (E)														
4	L2	5	0.0	5	0.0	0.077	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	58.1
5	T1	372	4.2	372	4.2	0.121	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		377	4.2	377	4.2	0.121	0.2	NA	0.0	0.0	0.00	0.01	0.00	59.8
North: Young Street (N)														
7	L2	77	2.7	77	2.7	0.091	9.1	LOS A	0.1	0.8	0.31	0.89	0.31	47.2
Approach		77	2.7	77	2.7	0.091	9.1	LOS A	0.1	0.8	0.31	0.89	0.31	47.2
West: McEvoy Street (W)														
10	L2	56	1.9	56	1.9	0.144	5.6	LOS A	0.0	0.0	0.00	0.14	0.00	57.0
11	T1	443	6.2	443	6.2	0.144	0.1	LOS A	0.0	0.3	0.02	0.07	0.02	58.6
12	R2	7	14.3	7	14.3	0.144	7.5	LOS A	0.0	0.3	0.04	0.02	0.04	59.4
Approach		506	5.8	506	5.8	0.144	0.8	NA	0.0	0.3	0.02	0.07	0.02	58.3
All Vehicles		983	4.8	983	4.8	0.144	1.5	NA	0.1	0.8	0.04	0.13	0.04	57.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

 Site: 101 [Powell / Young (Site Folder: AM Existing)]

 Network: N102 [Existing AM (Network Folder: General)]

Powell / Young  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
East: Powell Street (E)														
5	T1	57	1.9	57	1.9	0.048	0.1	LOS A	0.1	0.5	0.10	0.20	0.10	56.7
6	R2	29	7.1	29	7.1	0.048	5.3	LOS A	0.1	0.5	0.10	0.20	0.10	43.6
Approach		86	3.7	86	3.7	0.048	1.9	NA	0.1	0.5	0.10	0.20	0.10	55.4
North: Young Street (N)														
7	L2	15	7.1	15	7.1	0.032	8.4	LOS A	0.0	0.3	0.11	0.94	0.11	36.9
9	R2	21	5.0	21	5.0	0.032	8.6	LOS A	0.0	0.3	0.11	0.94	0.11	48.4
Approach		36	5.9	36	5.9	0.032	8.5	LOS A	0.0	0.3	0.11	0.94	0.11	45.9
West: Powell Street (W)														
10	L2	31	6.9	31	6.9	0.032	5.7	LOS A	0.0	0.0	0.00	0.30	0.00	55.0
11	T1	28	0.0	28	0.0	0.032	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	55.0
Approach		59	3.6	59	3.6	0.032	2.9	NA	0.0	0.0	0.00	0.30	0.00	55.0
All Vehicles		181	4.1	181	4.1	0.048	3.5	NA	0.1	0.5	0.07	0.38	0.07	52.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

Site: 101 [Lachlan / Bourke (Site Folder: AM Existing + Woolies + School)]

Network: N102 [Existing AM + Woolies + School (Network Folder: General)]

Lachlan / Bourke

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Bourke Street (S)														
2	T1	527	9.0	527	9.0	0.552	19.8	LOS B	8.6	65.0	0.78	0.70	0.78	38.2
3	R2	329	7.3	329	7.3	*0.856	64.3	LOS E	8.7	65.0	1.00	0.90	1.12	18.4
Approach		857	8.4	857	8.4	0.856	36.9	LOS C	8.7	65.0	0.86	0.78	0.91	27.8
East: Lachlan Street (E)														
4	L2	637	5.8	637	5.8	0.833	39.5	LOS C	14.7	107.6	0.88	0.93	1.05	23.6
6	R2	116	3.6	116	3.6	*0.833	54.1	LOS D	10.3	75.0	0.99	0.95	1.21	29.8
Approach		753	5.5	753	5.5	0.833	41.7	LOS C	14.7	107.6	0.90	0.93	1.07	25.1
North: Bourke Street (N)														
7	L2	34	6.3	34	6.3	*0.838	63.5	LOS E	5.5	41.3	1.00	1.00	1.35	28.5
8	T1	276	8.4	276	8.4	0.838	56.6	LOS E	5.9	44.5	0.99	1.00	1.34	21.0
Approach		309	8.2	309	8.2	0.838	57.4	LOS E	5.9	44.5	0.99	1.00	1.34	22.1
All Vehicles		1919	7.2	1919	7.2	0.856	42.1	LOS C	14.7	107.6	0.90	0.87	1.04	25.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
					[ Ped ped	Dist ] m					
East: Lachlan Street (E)											
P2	Full	62	49.3	LOS E	0.2	0.2	0.95	0.95	75.9	31.9	0.42
North: Bourke Street (N)											
P3	Full	56	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
All Pedestrians		118	49.3	LOS E	0.2	0.2	0.95	0.95	77.2	33.5	0.43

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

**Site: 101 [McEvoy / Bourke (Site Folder: AM Existing + Woolies + School)]**

**Network: N102 [Existing AM + Woolies + School (Network Folder: General)]**

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Bourke Street (S)														
1	L2	32	3.3	32	3.3	*0.774	48.0	LOS D	8.2	61.7	0.96	0.92	1.10	14.1
2	T1	465	10.0	465	10.0	0.774	41.5	LOS C	8.3	63.1	0.96	0.92	1.10	14.4
Approach		497	9.5	497	9.5	0.774	42.0	LOS C	8.3	63.1	0.96	0.92	1.10	14.4
North: Bourke Street (N)														
8	T1	564	7.3	564	7.3	0.444	13.1	LOS A	8.7	65.0	0.72	0.65	0.72	16.3
9	R2	353	5.4	353	5.4	*0.775	59.5	LOS E	8.9	65.0	1.00	0.88	1.04	4.5
Approach		917	6.5	917	6.5	0.775	30.9	LOS C	8.9	65.0	0.83	0.74	0.85	8.2
West: McEvoy Street (W)														
10	L2	385	6.6	385	6.6	0.767	37.2	LOS C	10.1	74.7	0.89	0.89	0.98	9.1
12	R2	163	7.1	163	7.1	*0.767	56.0	LOS D	7.1	52.5	1.00	0.90	1.14	6.4
Approach		548	6.7	548	6.7	0.767	42.8	LOS D	10.1	74.7	0.92	0.89	1.03	8.1
All Vehicles		1962	7.3	1962	7.3	0.775	37.1	LOS C	10.1	74.7	0.89	0.83	0.96	10.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
South: Bourke Street (S)											
P1	Full	81	49.3	LOS E	0.2	0.2	0.95	0.95	78.7	35.2	0.45
West: McEvoy Street (W)											
P4	Full	46	49.3	LOS E	0.1	0.1	0.95	0.95	78.6	35.2	0.45
All Pedestrians		127	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45


Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.



# MOVEMENT SUMMARY

 Site: 101 [McEvoy / Young (Site Folder: AM Existing + Woolies + School)]

 Network: N102 [Existing AM + Woolies + School (Network Folder: General)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Young Street (S)														
1	L2	89	0.0	89	0.0	0.084	9.2	LOS A	0.2	1.1	0.25	0.87	0.25	48.8
3	R2	39	0.0	39	0.0	0.171	23.0	LOS B	0.2	1.7	0.78	1.00	0.78	22.4
Approach		128	0.0	128	0.0	0.171	13.4	LOS A	0.2	1.7	0.41	0.91	0.41	43.0
East: McEvoy Street (E)														
4	L2	11	0.0	11	0.0	0.079	5.5	LOS A	0.0	0.0	0.00	0.04	0.00	56.4
5	T1	372	4.2	372	4.2	0.123	0.2	LOS A	0.0	0.0	0.00	0.02	0.00	59.7
Approach		382	4.1	382	4.1	0.123	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.7
North: Young Street (N)														
7	L2	77	2.7	77	2.7	0.094	9.1	LOS A	0.1	0.8	0.30	0.89	0.30	47.2
Approach		77	2.7	77	2.7	0.094	9.1	LOS A	0.1	0.8	0.30	0.89	0.30	47.2
West: McEvoy Street (W)														
10	L2	56	1.9	56	1.9	0.147	5.6	LOS A	0.0	0.0	0.00	0.14	0.00	57.0
11	T1	443	6.2	443	6.2	0.147	0.1	LOS A	0.0	0.3	0.02	0.07	0.02	58.6
12	R2	7	14.3	7	14.3	0.147	7.6	LOS A	0.0	0.3	0.03	0.02	0.03	59.4
Approach		506	5.8	506	5.8	0.147	0.8	NA	0.0	0.3	0.02	0.07	0.02	58.3
All Vehicles		1094	4.3	1094	4.3	0.171	2.7	NA	0.2	1.7	0.08	0.21	0.08	55.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 Site: 101 [Bourke / Powell (Site Folder: AM Existing + Woolies + School)]

 Network: N102 [Existing AM + Woolies + School (Network Folder: General)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Bourke Street (S)														
1	L2	78	1.4	78	1.4	0.147	5.6	LOS A	0.0	0.0	0.00	0.17	0.00	57.0
2	T1	476	4.4	476	4.4	0.147	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	58.7
Approach		554	4.0	554	4.0	0.147	0.8	NA	0.0	0.0	0.00	0.08	0.00	58.4
North: Bourke Street (N)														
8	T1	655	3.5	655	3.5	0.215	0.6	LOS A	0.3	2.4	0.11	0.06	0.11	58.4
9	R2	69	1.5	69	1.5	0.215	9.0	LOS A	0.3	2.4	0.30	0.16	0.30	48.2
Approach		724	3.3	724	3.3	0.215	1.4	NA	0.3	2.4	0.13	0.07	0.13	58.0
West: Powell Street (W)														
10	L2	21	0.0	21	0.0	0.165	8.7	LOS A	0.2	1.6	0.55	0.95	0.55	18.6
12	R2	60	0.0	60	0.0	0.165	15.3	LOS B	0.2	1.6	0.55	0.95	0.55	42.7
Approach		81	0.0	81	0.0	0.165	13.6	LOS A	0.2	1.6	0.55	0.95	0.55	40.0
All Vehicles		1359	3.4	1359	3.4	0.215	1.9	NA	0.3	2.4	0.10	0.13	0.10	56.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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Model\_May24.sip9

# MOVEMENT SUMMARY

**Site: 101 [Powell / Young (Site Folder: AM Existing + Woolies + School)]** **Network: N102 [Existing AM + Woolies + School (Network Folder: General)]**

Powell / Young  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
East: Powell Street (E)														
5	T1	57	1.9	57	1.9	0.087	0.3	LOS A	0.2	1.2	0.20	0.35	0.20	54.1
6	R2	92	2.3	92	2.3	0.087	5.4	LOS A	0.2	1.2	0.20	0.35	0.20	35.2
Approach		148	2.1	148	2.1	0.087	3.4	NA	0.2	1.2	0.20	0.35	0.20	48.9
North: Young Street (N)														
7	L2	28	3.7	28	3.7	0.049	8.3	LOS A	0.1	0.5	0.10	0.95	0.10	36.6
9	R2	26	4.0	26	4.0	0.049	8.9	LOS A	0.1	0.5	0.10	0.95	0.10	48.2
Approach		55	3.8	55	3.8	0.049	8.6	LOS A	0.1	0.5	0.10	0.95	0.10	44.7
West: Powell Street (W)														
10	L2	68	3.1	68	3.1	0.052	5.7	LOS A	0.0	0.0	0.00	0.41	0.00	53.3
11	T1	28	0.0	28	0.0	0.052	0.0	LOS A	0.0	0.0	0.00	0.41	0.00	53.3
Approach		97	2.2	97	2.2	0.052	4.1	NA	0.0	0.0	0.00	0.41	0.00	53.3
All Vehicles		300	2.5	300	2.5	0.087	4.6	NA	0.2	1.2	0.12	0.48	0.12	49.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).  
 Vehicle movement LOS values are based on average delay per movement.  
 Minor Road Approach LOS values are based on average delay for all vehicle movements.  
 NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.  
 Delay Model: SIDRA Standard (Geometric Delay is included).  
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).  
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

Site: 101 [McEvoy / Bourke (Site Folder: PM Existing)]

Network: N101 [Existing PM (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Bourke Street (S)														
1	L2	43	2.4	43	2.4	*0.779	50.5	LOS D	9.3	68.3	0.98	0.93	1.11	13.5
2	T1	456	6.2	456	6.2	0.779	45.1	LOS D	9.3	68.3	0.98	0.93	1.12	13.6
Approach		499	5.9	499	5.9	0.779	45.6	LOS D	9.3	68.3	0.98	0.93	1.12	13.5
North: Bourke Street (N)														
8	T1	519	6.9	519	6.9	0.408	9.8	LOS A	8.8	65.0	0.58	0.52	0.58	20.0
9	R2	443	1.0	443	1.0	*0.777	53.2	LOS D	9.2	65.0	1.00	0.89	1.03	5.0
Approach		962	4.2	962	4.2	0.777	29.8	LOS C	9.2	65.0	0.78	0.69	0.79	8.4
West: McEvoy Street (W)														
10	L2	379	0.6	379	0.6	0.534	22.2	LOS B	7.9	55.4	0.68	0.79	0.68	13.8
12	R2	260	0.8	260	0.8	*0.774	55.6	LOS D	8.7	61.4	1.00	0.89	1.12	6.4
Approach		639	0.7	639	0.7	0.774	35.8	LOS C	8.7	61.4	0.81	0.83	0.86	9.4
All Vehicles		2100	3.5	2100	3.5	0.779	35.4	LOS C	9.3	68.3	0.83	0.79	0.89	10.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
					[ Ped ped	Dist ] m					
South: Bourke Street (S)											
P1	Full	69	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
West: McEvoy Street (W)											
P4	Full	52	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
All Pedestrians		121	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.



# MOVEMENT SUMMARY

Site: 101 [Lachlan / Bourke (Site Folder: PM Existing)]

Network: N101 [Existing PM (Network Folder: General)]

Lachlan / Bourke

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Bourke Street (S)														
2	T1	416	4.8	416	4.8	0.372	15.9	LOS B	8.9	65.0	0.72	0.63	0.72	41.1
3	R2	388	1.9	388	1.9	*0.833	60.3	LOS E	9.1	65.0	1.00	0.90	1.08	19.3
Approach		804	3.4	804	3.4	0.833	37.3	LOS C	9.1	65.0	0.85	0.76	0.89	27.4
East: Lachlan Street (E)														
4	L2	576	1.8	576	1.8	0.812	38.3	LOS C	13.3	94.9	0.88	0.91	1.02	24.0
6	R2	97	1.1	97	1.1	*0.812	55.7	LOS D	8.2	58.4	1.00	0.94	1.21	29.4
Approach		673	1.7	673	1.7	0.812	40.8	LOS C	13.3	94.9	0.90	0.92	1.05	25.2
North: Bourke Street (N)														
7	L2	56	0.0	56	0.0	*0.837	61.1	LOS E	7.3	53.9	1.00	1.01	1.29	29.1
8	T1	353	8.4	353	8.4	0.837	54.3	LOS D	7.9	59.1	1.00	1.01	1.29	21.5
Approach		408	7.2	408	7.2	0.837	55.3	LOS D	7.9	59.1	1.00	1.01	1.29	22.9
All Vehicles		1885	3.6	1885	3.6	0.837	42.5	LOS C	13.3	94.9	0.90	0.87	1.04	25.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
East: Lachlan Street (E)											
P2	Full	87	49.3	LOS E	0.3	0.3	0.95	0.95	75.9	31.9	0.42
North: Bourke Street (N)											
P3	Full	16	49.2	LOS E	0.0	0.0	0.95	0.95	78.5	35.2	0.45
All Pedestrians		103	49.3	LOS E	0.3	0.3	0.95	0.95	76.3	32.4	0.42

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

 Site: 101 [McEvoy / Young (Site Folder: PM Existing)]

 Network: N101 [Existing PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Young Street (S)														
1	L2	22	0.0	22	0.0	0.022	9.4	LOS A	0.0	0.3	0.28	0.85	0.28	48.7
2	T1	1	0.0	1	0.0	0.067	25.0	LOS B	0.1	0.6	0.83	1.00	0.83	35.9
3	R2	9	0.0	9	0.0	0.067	29.0	LOS C	0.1	0.6	0.83	1.00	0.83	19.3
Approach		33	0.0	33	0.0	0.067	15.6	LOS B	0.1	0.6	0.45	0.90	0.45	41.3
East: McEvoy Street (E)														
4	L2	7	0.0	7	0.0	0.098	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	58.0
5	T1	477	1.1	477	1.1	0.153	0.2	LOS A	0.0	0.0	0.00	0.01	0.00	59.8
Approach		484	1.1	484	1.1	0.153	0.3	NA	0.0	0.0	0.00	0.01	0.00	59.8
North: Young Street (N)														
7	L2	76	0.0	76	0.0	0.084	9.4	LOS A	0.1	0.9	0.37	0.89	0.37	46.8
Approach		76	0.0	76	0.0	0.084	9.4	LOS A	0.1	0.9	0.37	0.89	0.37	46.8
West: McEvoy Street (W)														
10	L2	71	0.0	71	0.0	0.174	5.6	LOS A	0.0	0.0	0.00	0.13	0.00	57.2
11	T1	554	0.8	554	0.8	0.174	0.1	LOS A	0.1	0.7	0.04	0.08	0.04	58.2
12	R2	17	0.0	17	0.0	0.174	7.7	LOS A	0.1	0.7	0.08	0.03	0.08	58.7
Approach		641	0.7	641	0.7	0.174	0.9	NA	0.1	0.7	0.04	0.08	0.04	58.1
All Vehicles		1234	0.8	1234	0.8	0.174	1.6	NA	0.1	0.9	0.05	0.12	0.05	57.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

 Site: 101 [Bourke / Powell (Site Folder: PM Existing)]

 Network: N101 [Existing PM (Network Folder: General)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Bourke Street (S)														
1	L2	63	1.7	63	1.7	0.136	5.6	LOS A	0.0	0.0	0.00	0.15	0.00	57.3
2	T1	452	4.4	452	4.4	0.136	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	58.8
Approach		515	4.1	515	4.1	0.136	0.7	NA	0.0	0.0	0.00	0.07	0.00	58.6
North: Bourke Street (N)														
8	T1	724	3.8	724	3.8	0.224	0.4	LOS A	0.3	2.0	0.09	0.04	0.09	58.7
9	R2	55	5.8	55	5.8	0.224	9.0	LOS A	0.3	2.0	0.22	0.10	0.22	51.1
Approach		779	3.9	779	3.9	0.224	1.0	NA	0.3	2.0	0.10	0.05	0.10	58.5
West: Powell Street (W)														
10	L2	19	0.0	19	0.0	0.126	8.6	LOS A	0.2	1.2	0.51	0.94	0.51	18.8
12	R2	43	0.0	43	0.0	0.126	15.5	LOS B	0.2	1.2	0.51	0.94	0.51	42.7
Approach		62	0.0	62	0.0	0.126	13.4	LOS A	0.2	1.2	0.51	0.94	0.51	39.5
All Vehicles		1356	3.8	1356	3.8	0.224	1.5	NA	0.3	2.0	0.08	0.10	0.08	57.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

 Site: 101 [Powell / Young (Site Folder: PM Existing)]

 Network: N101 [Existing PM (Network Folder: General)]

Powell / Young  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
East: Powell Street (E)														
5	T1	76	1.4	76	1.4	0.065	0.1	LOS A	0.1	0.7	0.13	0.20	0.13	56.4
6	R2	41	5.1	41	5.1	0.065	5.3	LOS A	0.1	0.7	0.13	0.20	0.13	42.7
Approach		117	2.7	117	2.7	0.065	2.0	NA	0.1	0.7	0.13	0.20	0.13	55.0
North: Young Street (N)														
7	L2	22	0.0	22	0.0	0.049	8.2	LOS A	0.1	0.5	0.14	0.93	0.14	36.8
9	R2	33	0.0	33	0.0	0.049	8.6	LOS A	0.1	0.5	0.14	0.93	0.14	48.5
Approach		55	0.0	55	0.0	0.049	8.4	LOS A	0.1	0.5	0.14	0.93	0.14	46.1
West: Powell Street (W)														
10	L2	39	5.4	39	5.4	0.042	5.7	LOS A	0.0	0.0	0.00	0.29	0.00	55.2
11	T1	40	0.0	40	0.0	0.042	0.0	LOS A	0.0	0.0	0.00	0.29	0.00	55.2
Approach		79	2.7	79	2.7	0.042	2.8	NA	0.0	0.0	0.00	0.29	0.00	55.2
All Vehicles		251	2.1	251	2.1	0.065	3.6	NA	0.1	0.7	0.09	0.39	0.09	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

**Site:** 101 [Lachlan / Bourke (Site Folder: PM Existing + Woolies + School)] **Network:** N101 [Existing PM + Woolies + School (Network Folder: General)]

Lachlan / Bourke

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Bourke Street (S)														
2	T1	421	4.8	421	4.8	0.377	16.4	LOS B	8.9	65.0	0.74	0.65	0.74	40.7
3	R2	400	1.8	400	1.8	*0.857	61.7	LOS E	9.1	65.0	1.00	0.91	1.10	19.0
Approach		821	3.3	821	3.3	0.857	38.5	LOS C	9.1	65.0	0.86	0.78	0.91	27.0
East: Lachlan Street (E)														
4	L2	587	1.8	587	1.8	0.826	40.3	LOS C	14.1	100.3	0.90	0.93	1.05	23.3
6	R2	97	1.1	97	1.1	*0.826	57.1	LOS E	8.5	60.5	1.00	0.95	1.23	29.0
Approach		684	1.7	684	1.7	0.826	42.6	LOS D	14.1	100.3	0.91	0.93	1.08	24.6
North: Bourke Street (N)														
7	L2	56	0.0	56	0.0	*0.856	63.4	LOS E	7.7	56.5	1.00	1.03	1.34	28.5
8	T1	362	8.1	362	8.1	0.856	56.9	LOS E	8.3	62.1	1.00	1.04	1.33	20.9
Approach		418	7.1	418	7.1	0.856	57.7	LOS E	8.3	62.1	1.00	1.04	1.33	22.2
All Vehicles		1923	3.6	1923	3.6	0.857	44.1	LOS D	14.1	100.3	0.91	0.89	1.06	24.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
East: Lachlan Street (E)											
P2	Full	87	49.3	LOS E	0.3	0.3	0.95	0.95	75.9	31.9	0.42
North: Bourke Street (N)											
P3	Full	16	49.2	LOS E	0.0	0.0	0.95	0.95	78.5	35.2	0.45
All Pedestrians		103	49.3	LOS E	0.3	0.3	0.95	0.95	76.3	32.4	0.42

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

**Site:** 101 [McEvoy / Bourke (Site Folder: PM Existing + Woolies + School)] **Network:** N101 [Existing PM + Woolies + School (Network Folder: General)]

New Site

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 110 seconds (Network User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %	v/c	sec		[ Veh. veh	Dist ] m				km/h
South: Bourke Street (S)														
1	L2	43	2.4	43	2.4	* 0.806	53.0	LOS D	9.4	69.0	0.99	0.96	1.16	12.9
2	T1	456	6.2	456	6.2	0.806	47.6	LOS D	9.4	69.0	0.99	0.97	1.18	13.0
Approach		499	5.9	499	5.9	0.806	48.1	LOS D	9.4	69.0	0.99	0.97	1.18	13.0
North: Bourke Street (N)														
8	T1	519	6.9	519	6.9	0.402	9.4	LOS A	8.8	65.0	0.58	0.52	0.58	20.5
9	R2	477	0.9	477	0.9	* 0.812	54.0	LOS D	9.2	65.0	1.00	0.90	1.05	4.9
Approach		996	4.0	996	4.0	0.812	30.7	LOS C	9.2	65.0	0.78	0.70	0.80	8.2
West: McEvoy Street (W)														
10	L2	394	0.5	394	0.5	0.593	23.1	LOS B	8.6	60.6	0.71	0.80	0.71	13.4
12	R2	262	0.8	262	0.8	* 0.822	59.1	LOS E	9.2	64.5	1.00	0.92	1.19	6.1
Approach		656	0.6	656	0.6	0.822	37.5	LOS C	9.2	64.5	0.83	0.85	0.91	9.0
All Vehicles		2151	3.4	2151	3.4	0.822	36.8	LOS C	9.4	69.0	0.84	0.81	0.92	10.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

\* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[ Ped ped	Dist ] m			sec	m	m/sec
South: Bourke Street (S)											
P1	Full	69	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
West: McEvoy Street (W)											
P4	Full	52	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45
All Pedestrians		121	49.3	LOS E	0.2	0.2	0.95	0.95	78.6	35.2	0.45

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

# MOVEMENT SUMMARY

 Site: 101 [McEvoy / Young (Site Folder: PM Existing + Woolies + School)]

 Network: N101 [Existing PM + Woolies + School (Network Folder: General)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Young Street (S)														
1	L2	43	0.0	43	0.0	0.041	9.4	LOS A	0.1	0.5	0.26	0.86	0.26	48.8
3	R2	18	0.0	18	0.0	0.126	30.6	LOS C	0.2	1.1	0.84	1.00	0.84	18.4
Approach		61	0.0	61	0.0	0.126	15.6	LOS B	0.2	1.1	0.43	0.90	0.43	41.3
East: McEvoy Street (E)														
4	L2	41	0.0	41	0.0	0.105	5.5	LOS A	0.0	0.0	0.00	0.12	0.00	51.0
5	T1	477	1.1	477	1.1	0.164	0.2	LOS A	0.0	0.0	0.00	0.04	0.00	59.3
Approach		518	1.0	518	1.0	0.164	0.6	NA	0.0	0.0	0.00	0.05	0.00	59.2
North: Young Street (N)														
7	L2	76	0.0	76	0.0	0.085	9.6	LOS A	0.1	0.9	0.38	0.89	0.38	46.8
Approach		76	0.0	76	0.0	0.085	9.6	LOS A	0.1	0.9	0.38	0.89	0.38	46.8
West: McEvoy Street (W)														
10	L2	71	0.0	71	0.0	0.183	5.6	LOS A	0.0	0.0	0.00	0.12	0.00	57.3
11	T1	554	0.8	554	0.8	0.183	0.2	LOS A	0.2	1.1	0.06	0.09	0.06	57.9
12	R2	26	0.0	26	0.0	0.183	7.9	LOS A	0.2	1.1	0.13	0.05	0.13	58.0
Approach		651	0.6	651	0.6	0.183	1.1	NA	0.2	1.1	0.06	0.09	0.06	57.8
All Vehicles		1305	0.7	1305	0.7	0.183	2.1	NA	0.2	1.1	0.07	0.16	0.07	56.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

 Site: 101 [Bourke / Powell (Site Folder: PM Existing + Woolies + School)]

 Network: N101 [Existing PM + Woolies + School (Network Folder: General)]

New Site  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
South: Bourke Street (S)														
1	L2	83	1.3	83	1.3	0.140	5.6	LOS A	0.0	0.0	0.00	0.19	0.00	56.6
2	T1	443	4.5	443	4.5	0.140	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	58.5
Approach		526	4.0	526	4.0	0.140	0.9	NA	0.0	0.0	0.00	0.09	0.00	58.2
North: Bourke Street (N)														
8	T1	718	3.8	718	3.8	0.225	0.5	LOS A	0.3	2.2	0.10	0.05	0.10	58.6
9	R2	59	5.4	59	5.4	0.225	9.1	LOS A	0.3	2.2	0.24	0.12	0.24	50.4
Approach		777	3.9	777	3.9	0.225	1.1	NA	0.3	2.2	0.11	0.05	0.11	58.4
West: Powell Street (W)														
10	L2	22	0.0	22	0.0	0.168	8.5	LOS A	0.2	1.6	0.53	0.95	0.53	18.4
12	R2	59	0.0	59	0.0	0.168	15.7	LOS B	0.2	1.6	0.53	0.95	0.53	42.5
Approach		81	0.0	81	0.0	0.168	13.8	LOS A	0.2	1.6	0.53	0.95	0.53	39.6
All Vehicles		1384	3.7	1384	3.7	0.225	1.8	NA	0.3	2.2	0.09	0.12	0.09	57.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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# MOVEMENT SUMMARY

 Site: 101 [Powell / Young (Site Folder: PM Existing + Woolies + School)]  Network: N101 [Existing PM + Woolies + School (Network Folder: General)]

Powell / Young  
 Site Category: (None)  
 Stop (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[ Total veh/h	HV %	[ Total veh/h	HV %				[ Veh. veh	Dist ] m				
East: Powell Street (E)														
5	T1	76	1.4	76	1.4	0.081	0.2	LOS A	0.1	1.0	0.17	0.27	0.17	55.3
6	R2	66	3.2	66	3.2	0.081	5.4	LOS A	0.1	1.0	0.17	0.27	0.17	38.8
Approach		142	2.2	142	2.2	0.081	2.6	NA	0.1	1.0	0.17	0.27	0.17	52.6
North: Young Street (N)														
7	L2	47	0.0	47	0.0	0.074	8.2	LOS A	0.1	0.8	0.12	0.93	0.12	36.7
9	R2	38	0.0	38	0.0	0.074	8.8	LOS A	0.1	0.8	0.12	0.93	0.12	48.5
Approach		85	0.0	85	0.0	0.074	8.4	LOS A	0.1	0.8	0.12	0.93	0.12	44.6
West: Powell Street (W)														
10	L2	56	3.8	56	3.8	0.051	5.7	LOS A	0.0	0.0	0.00	0.34	0.00	54.4
11	T1	40	0.0	40	0.0	0.051	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	54.4
Approach		96	2.2	96	2.2	0.051	3.3	NA	0.0	0.0	0.00	0.34	0.00	54.4
All Vehicles		323	1.6	323	1.6	0.081	4.4	NA	0.1	1.0	0.11	0.46	0.11	50.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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