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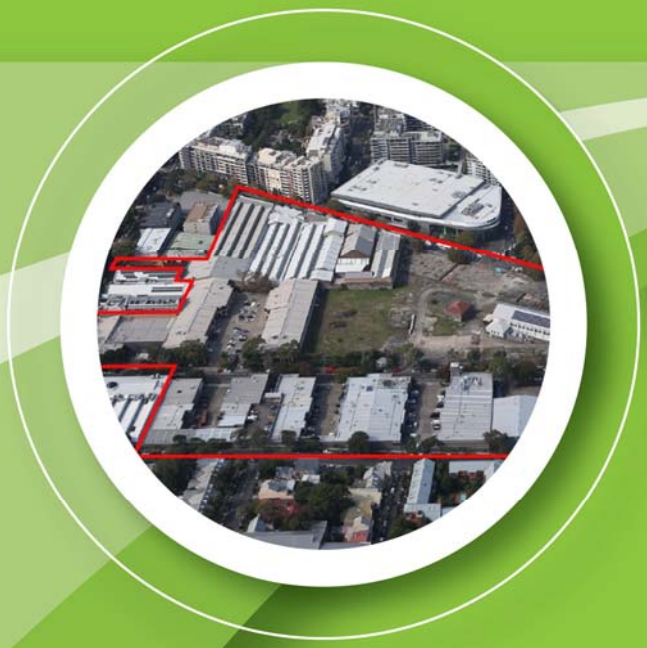

Danks Street South Precinct

Masterplan Transport Assessment

April 2017

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Danks Street South Precinct

Masterplan Transport Assessment

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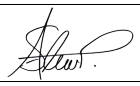
Signature	

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1. Introduction

1.1 Background

PeopleTrans worked on the Danks Street South Neighbourhood Urban Design Study with the City of Sydney in 2015. Since that time, the City of Sydney has continued working on the strategic plan for the development of the area and has now prepared a final draft plan. As part of the planning proposal and Gateway process, PeopleTrans was engaged by the City of Sydney in March 2017 to undertake a transport study to assess the impact of the proposal on the nearby transport network and to further inform the design.

It has been estimated that this development would cater for a maximum of approximately 3,000 residents and 128 employees.

1.2 Scope and Objectives of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

(1) the active transport requirements (pedestrians and cyclists)
(2) the public transport in the vicinity of the site.
(3) the existing traffic and transport conditions surrounding the site
(4) the service and emergency vehicle requirements
(5) the transport generating characteristics of the proposed development
(6) the suitability of the proposed access locations
(7) the transport impact of the proposal on the surrounding road network.

1.3 Future Traffic and Transport Proposals

PeopleTrans has identified the following background studies that could affect the study area in the future. These projects are being undertaken separately by other organisations and not the City of Sydney. At the time of writing this report, no information on additional traffic generation for McEvoy, Bourke and Lachlan Streets was available.

- Alexandria to Moore Park Connectivity Upgrade – This project is currently being investigated by RMS and could result in an upgrade to the intersection of McEvoy Street / Bourke Street / Lachlan Street, installation of additional clearway hours along the route, widening Lachlan Street from 2 lanes to 4 lanes, improving the intersection of Lachlan Street / South Dowling Street and improving the intersection of Anzac Parade / Dacey Avenue / Alison Road.
- Westconnex – This project will likely result in an increase in traffic in the general area however the exact impact is unknown at this stage.

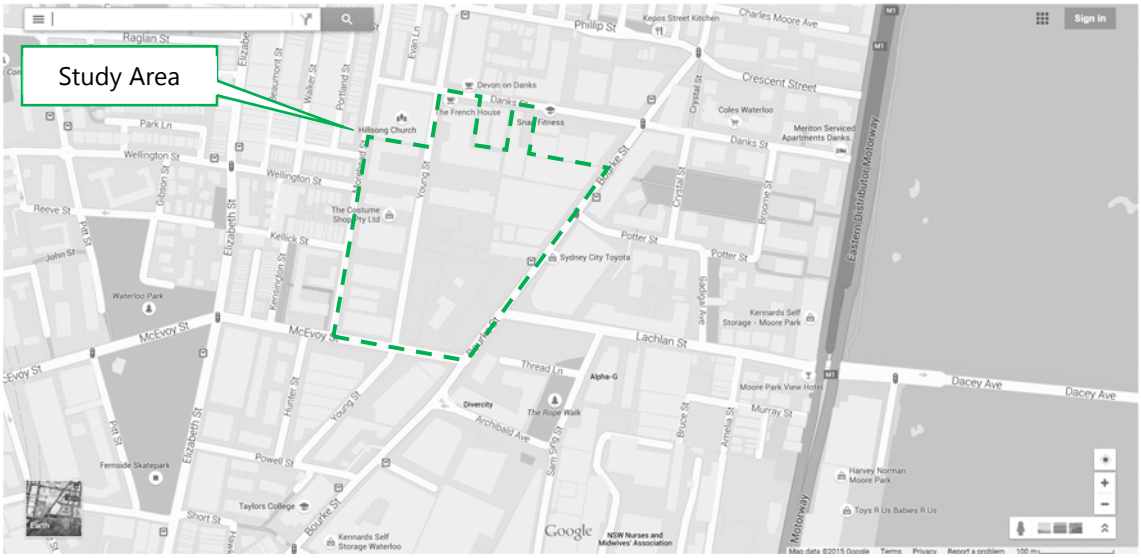
2. Existing Conditions

2.1 Site Location

The study area is generally bound by McEvoy Street, Bourke Street, Danks Street and Morehead Street. The site is currently occupied by a range of restricted retail, commercial and industrial uses.

The surrounding properties predominantly include residential and commercial uses. The location of the study area and its immediate vicinity is shown in Figure 2.1.

Figure 2.1: Study Area

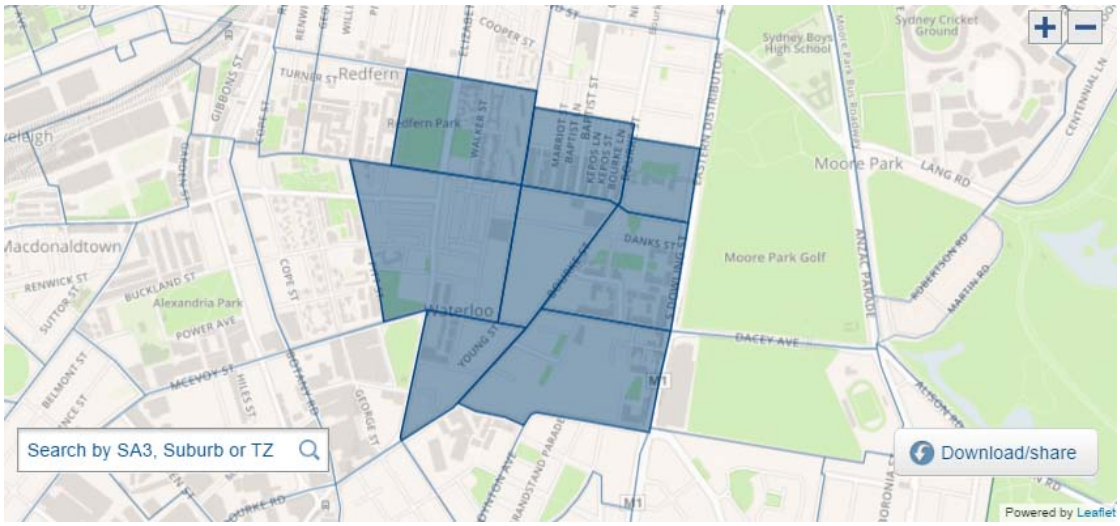


2.2 Local Area Travel Characteristics

To understand the existing level of transport mode usage among residents and to existing employees in the area, PeopleTrans has reviewed the 2011 census data as reported by the NSW Bureau of Transport Statistics. Travel Zones 219, 220, 221, 271, 272, 273, 275 and 276 have been selected as they cover or are immediately adjacent to the study area[1]. The selected travel zones are shown in Figure 2.2.

[1] Source: http://visual.bts.nsw.gov.au/jtwbasic/#273,272

Figure 2.2: Selected Travel Zones



Analysis of travel patterns for the existing 5,273 residents and 4,141 employees of these zones is summarised in Figure 2.3 and Figure 2.4[2].

Figure 2.3: Residents Living in the Travel Zones – Mode of Travel to Work

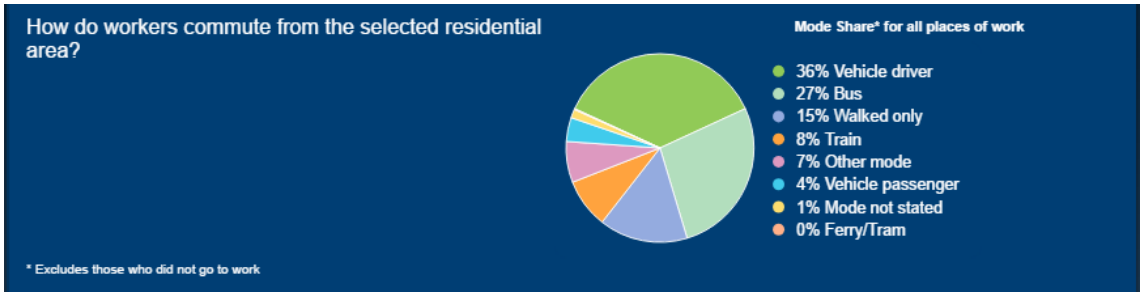


Figure 2.3 indicates that currently, 36% of residents of the selected travel zones currently travel to work by private vehicle with 35% travelling by bus and train. For the residents that work within the City of Sydney, 22% of residents drive to work and 40% take public transport. Overall, the data suggests that that public transport in the area is a relatively attractive option for residents. A total of 15% of residents walk to work which suggest this option is also attractive to residents.

Figure 2.4: Employees Working in the Travel Zones – Mode of Travel to Work

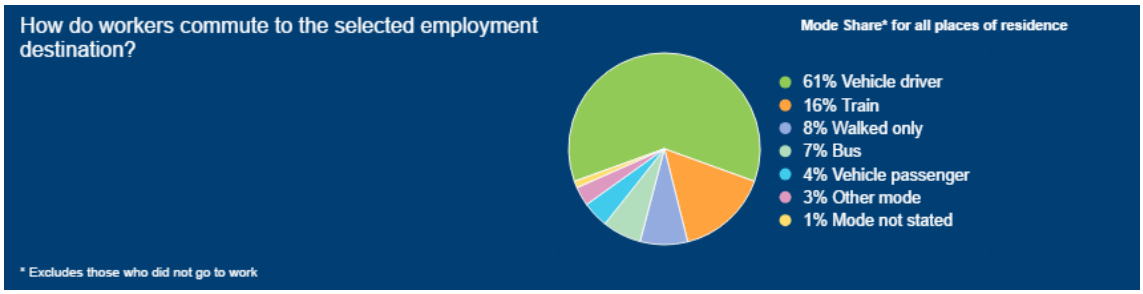


Figure 2.4 indicates that currently, 61% of employees within the selected travel zones currently travel to work by private vehicle with 23% travelling by bus and train.

[2] NSW Bureau of Transport Statistics

Overall, the site is considered to have good access to public transport which is evident through the use of transport modes other than vehicle driver.

2.3 Existing Land Use and People Occupancy

Information on the existing land uses and number of off-street car parking spaces within the study area was provided by the City of Sydney. A summary of the information is provided in Table 2.1.

Table 2.1: Existing Land Uses Within the Study Area

Address	Business Name	Major Uses	Total m^2 GFA	Off-Street Parking Capacity
207-229 Young Street	Various	Storage / Office	7,587	109
881-885 Bourke Street	Glicks Furniture	Furniture Store	3,846	15
887-893 Bourke Street	Lawrence Dry Cleaners	Industrial	6,633	2
895-899 Bourke Street	Boncrete Store	Industrial	2,205	13
901 Bourke Street	The Commune	Office	2,089	15
198-222 Young Street	Various	Business Park	11,279	108
224-228 Young Street	Vickers and Hoad	Auction House	1,548	19
230-234 Young Street	Paddington Prestige	Vehicle Repairs	1,812	
Total			**38,199**	**281**

Table 2.1 indicates that there is currently 38,199m^2 GFA with no residential dwellings currently within the study area. There are currently a total of 281 off-street car parking spaces within the study area. The NSW Bureau of Transport Statistics indicates that 1,253 people work in the two travel zones which closely approximate the study area. Based on an average of 1 employee per 50m2 GFA, the study area currently caters for approximately 760 employees.

2.4 Study Area Road Network

Details of the roads in close proximity to the site are provided in Figure 2.5.

Figure 2.5: Existing State Roads in the Vicinity of the Study Area

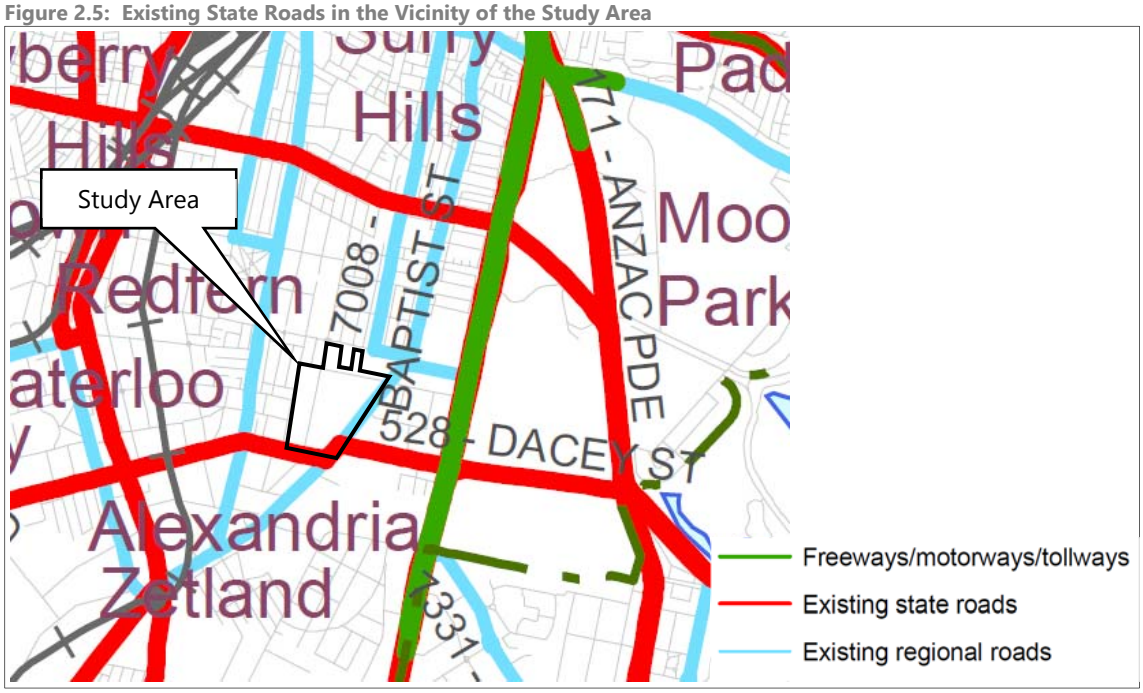


Figure 2.5 indicates that McEvoy Street and Lachlan Street which border the study area to the south are existing state roads and Bourke Street is an existing regional road. Regional roads are typically under the control, care and management of Council however Bourke Street between Lachlan Street and Crescent Street is a classified regional road (7008) and is under the control of Roads and Maritime Services. As such, any proposed changes to the study area road network will need approval from Roads and Maritime Services.

2.5 Existing Vehicle Movements

PeopleTrans commissioned vehicle movement counts on key roads in the vicinity of the site on 27/5/15 and 30/5/15 during the following peak periods:

- Weekday AM – 6:00am to 10:00am
- Weekday PM – 3:00pm to 7:00pm
- Saturday Midday – 11:00am to 2:00pm.

The Weekday AM, PM and Saturday Midday peak hour traffic volumes are summarised in Figure 2.6 to Figure 2.8.

Figure 2.6: Existing Weekday AM Peak Hour Traffic Volumes

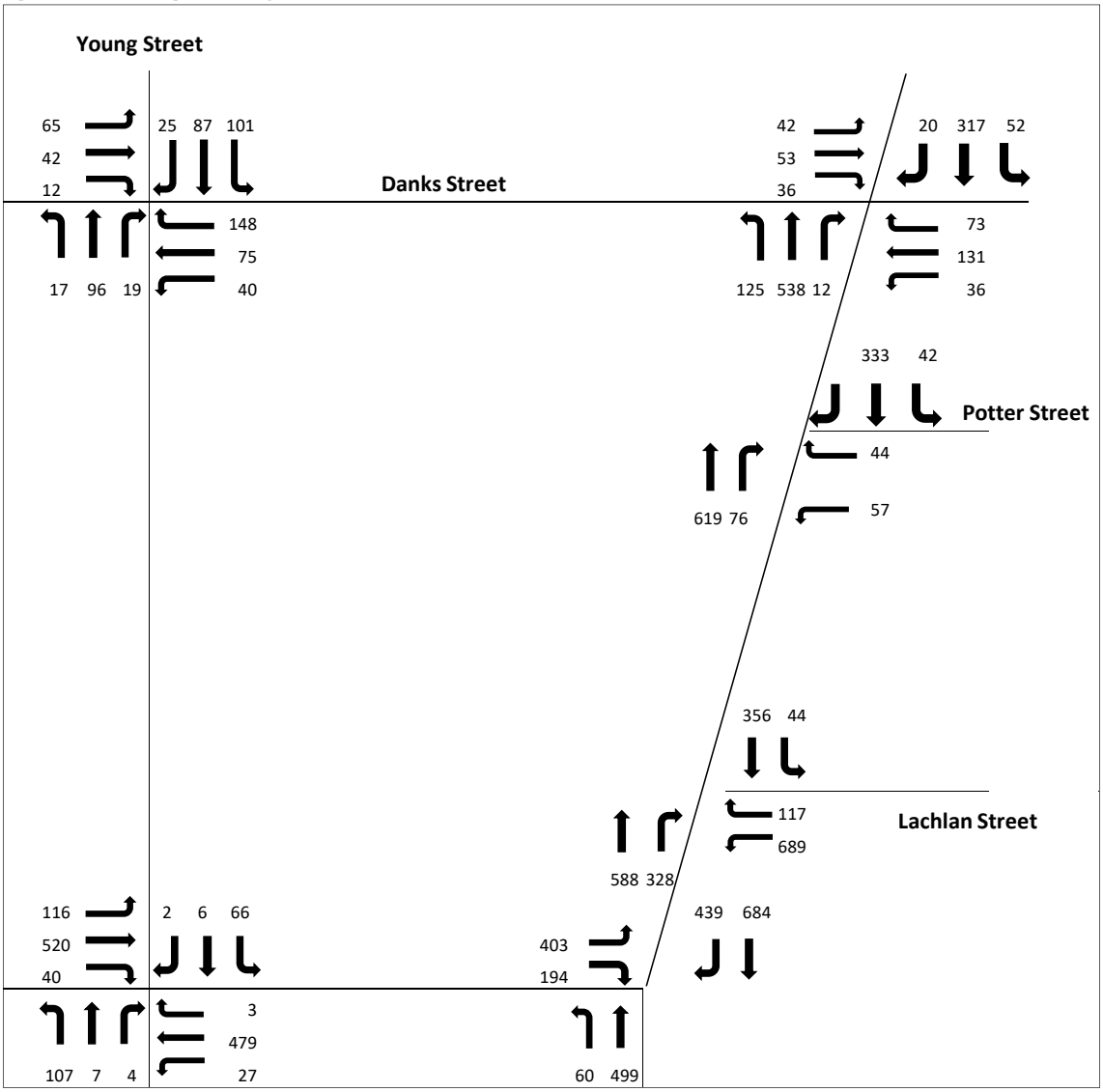


Figure 2.7: Existing Weekday PM Peak Hour Traffic Volumes

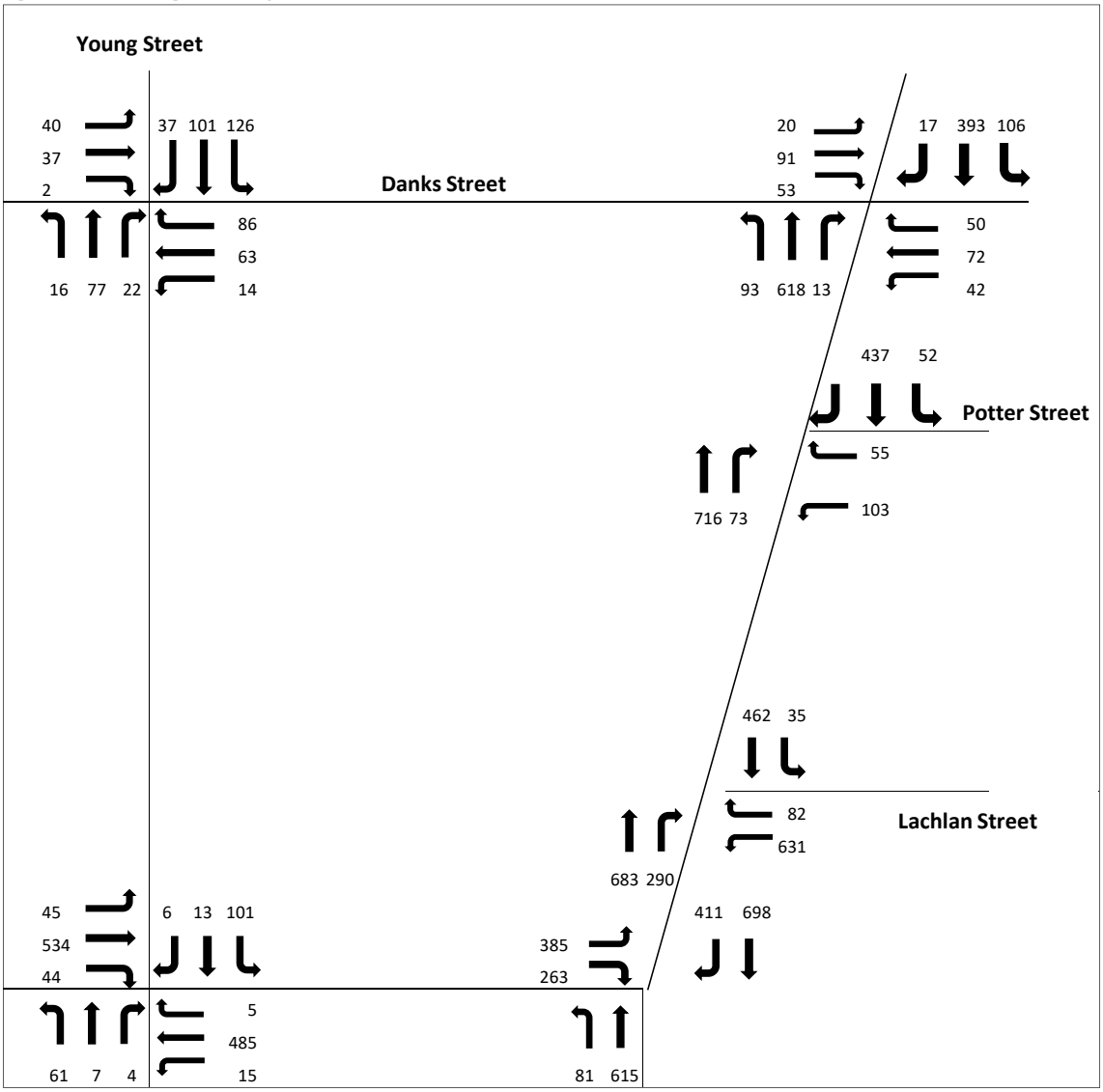
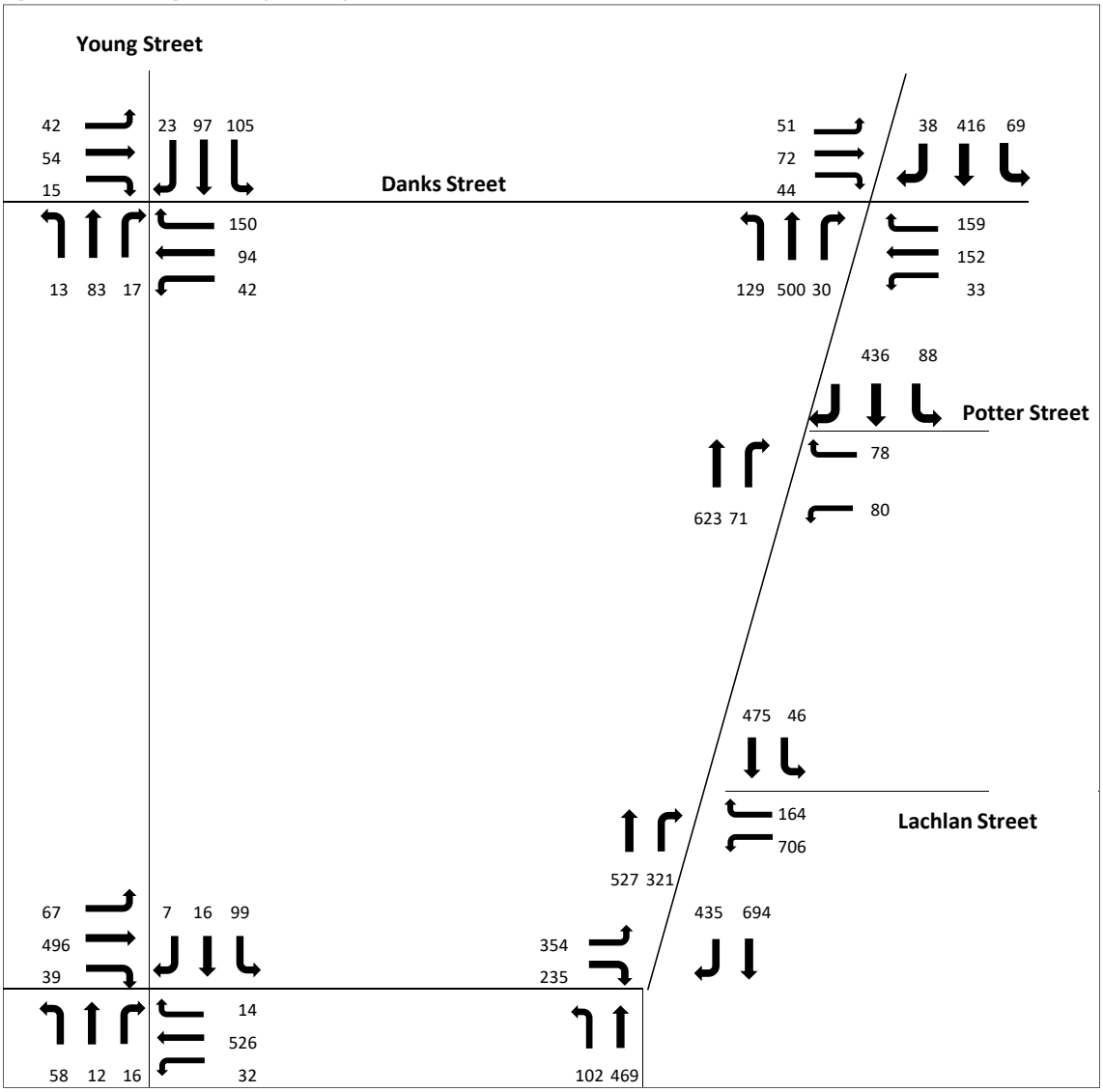


Figure 2.8: Existing Saturday Midday Peak Hour Traffic Volumes



Existing and future intersection modelling is set out in Section 6 of this report.

2.6 Public Transport

A summary of the bus stops and railway stations available in the vicinity of the site is provided in Figure 2.9.

Figure 2.9: Summary of Nearby Bus Stops and Railway Stations

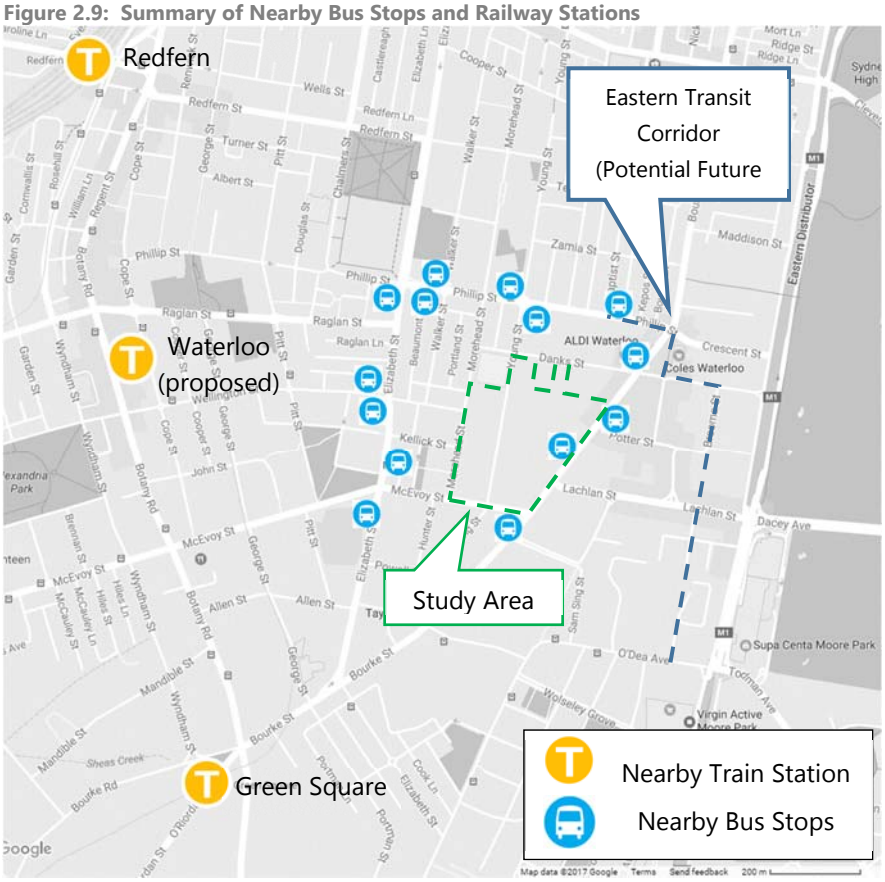


Figure 2.9 indicates that there are two train stations in the vicinity of the study area with Green Square the closest station approximately 1km walking distance and Redfern station approximately 1.5km walking distance.

Waterloo Station is proposed to be constructed as part of the Sydney Metro project and is expected to be operational in 2024[3]. The proposed station is approximately 1km from the centre of the study area to the proposed station location.

There are nearby bus stops on Bourke Street, Phillip Street, Wellington Street and Elizabeth Street. The routes that serve the site are 301, 302 303, 343, 355 and M20. These bus routes provide access to the City, north shore, between Marrickville and Bondi Junction, Botany, Kensington and Eastgardens in Pagewood.

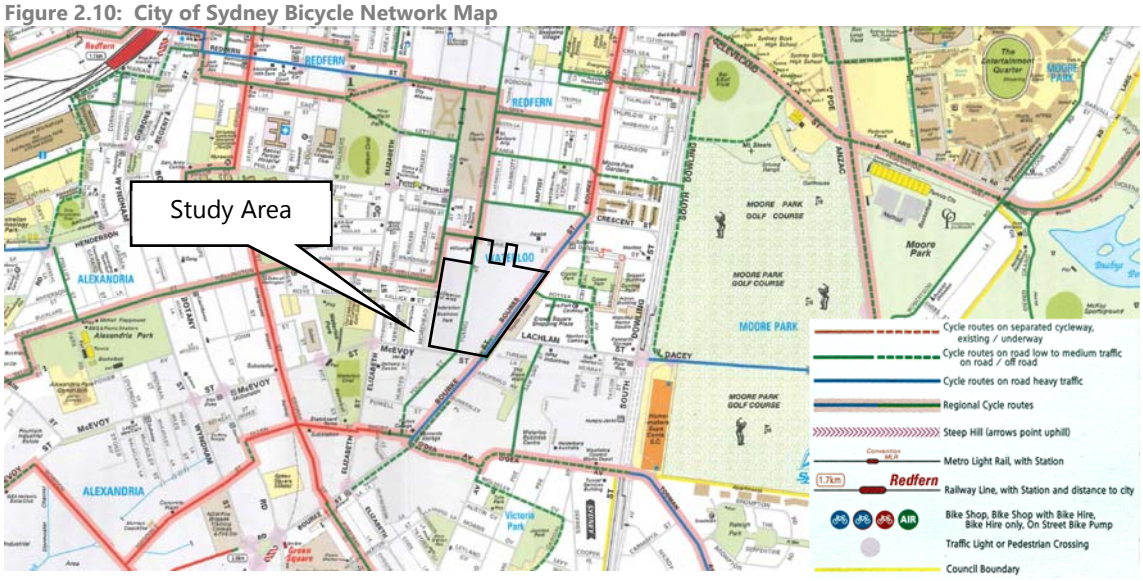
In summary, the nearby public transport network is currently considered good and would allow future residents and employees to access the area from the north, south, east and west.

[3] http://www.sydneymetro.info

2.7 Cycle Facilities

The City of Sydney bicycle network map is provided in Figure 2.10.

Figure 2.10: City of Sydney Bicycle Network Map



2.8 Pedestrian Facilities

Pedestrian paths are located on both sides of all roads within the study area.

Safe crossing points in vicinity of the site include the following pedestrian crossings:

- 2 legs of the Bourke Street / McEvoy Street intersection
- 2 legs of the Bourke Street / Lachlan Street intersection.
- All legs of the Bourke Street / Potter Street intersection
- All legs of the Bourke Street / Danks Street intersection.

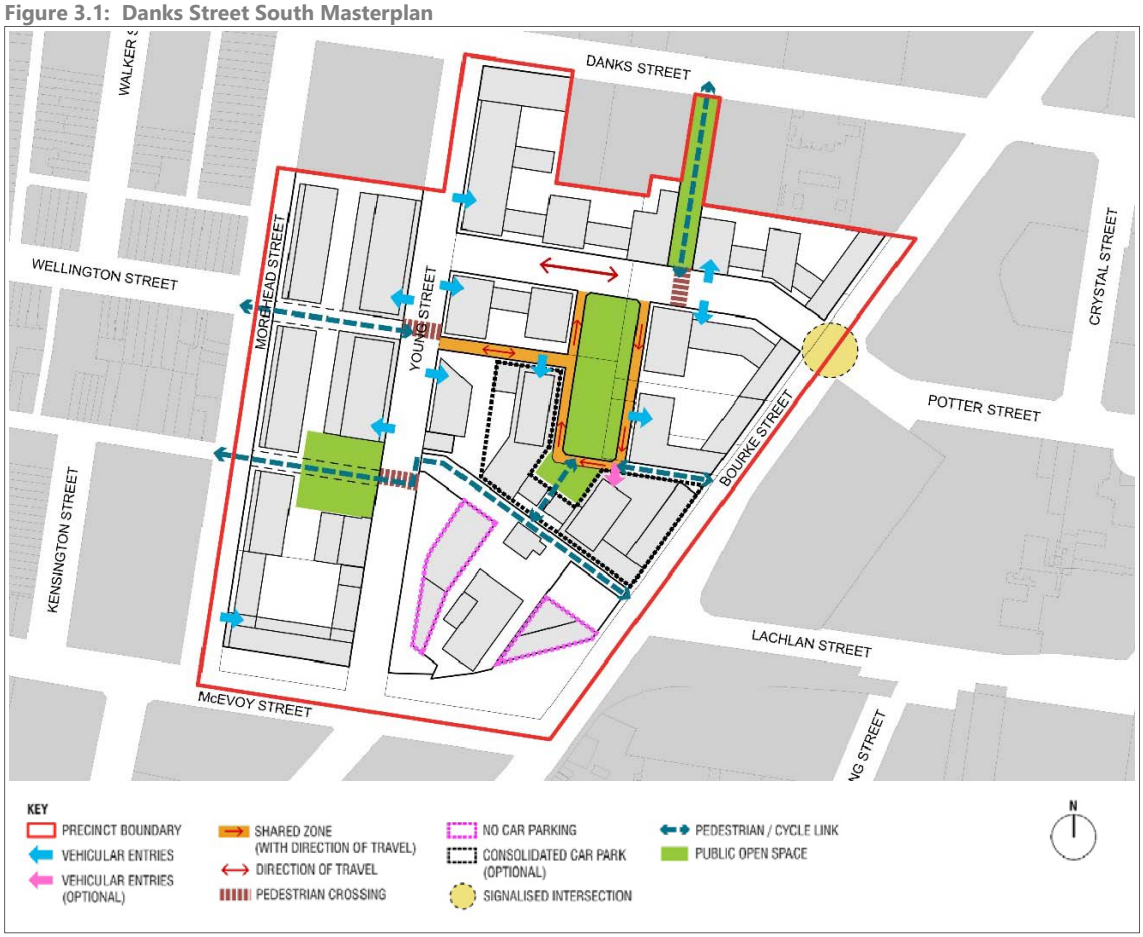
A pedestrian zebra crossing is located at the intersection of Young Street / Danks Street on the southern approach.

3. Proposed Masterplan

3.1 Overview

The proposed masterplan for the area has been developed by the City of Sydney.

Figure 3.1: Danks Street South Masterplan



3.2 Land Uses, Car Parking & People Occupancy

The proposed development includes the construction of a mixture of residential and commercial uses, as summarised in Table 3.1.

Table 3.1: Indicative Development Schedule

Apartments	Car Parking Spaces	Residents [1]	Combined Commercial /Retail m² GFA	Commercial Car Parking Spaces	Employees [2]
1,275-1,460	**934**	**2,601-2,978**	**4,455**	**35**	**128**

[1] Based on an average of 2.04 residents per apartment, obtained from the 2011 census data for the study area and immediate surrounds

[2] Based on an average of 1 employee / 50m2 for retail use, 1 employee per 20m2 for office use and a 50% split between retail and office use

The City of Sydney draft planning controls allow for some flexibility on the mixture of 1, 2 and 3 bedroom units within a development. This means that between 1,275 and 1,460 apartments could be developed within the study area with a maximum of 934 car parking spaces expected for residents. A

total of approximately 4,455m^2 of commercial floor area is also proposed within the study area and 35 car parking spaces for commercial use.

In people terms this is equivalent to a maximum of approximately 3,000 residents and 128 employees.

3.3 Vehicle Access

Figure 3.1 indicates that there are 10 proposed vehicle access locations and 1 optional access location. The suitability of the proposed access arrangements is discussed in Section 6.4 of this report.

3.4 Car Parking

As outlined in Table 3.1, the proposed development may provide a maximum total of approximately 969 car parking spaces which includes a maximum of 934 residential car parking spaces at approximately 35 commercial car parking spaces (figures provided by the City of Sydney calculated from rates in the City of Sydney Local Environmental Plan).

3.5 Pedestrian and Bicycle Facilities

A shared zone is proposed around a central park. Additional through site links and pedestrian zebra crossings are proposed on the new site east-west road and on Young Street.

The suitability of the proposed pedestrian facilities is discussed in Section 4.3 of this report.

The City of Sydney Development Control Plan 2012 would require approximately 500 bicycle parking spaces in the private developments. This would be dealt with as part of the Development Application for each site.

3.6 Loading and Service Vehicle Access

No detailed information has been provided on the loading and service requirements at this stage and it is expected that this will be undertaken at a more detailed stage of the development of each site.

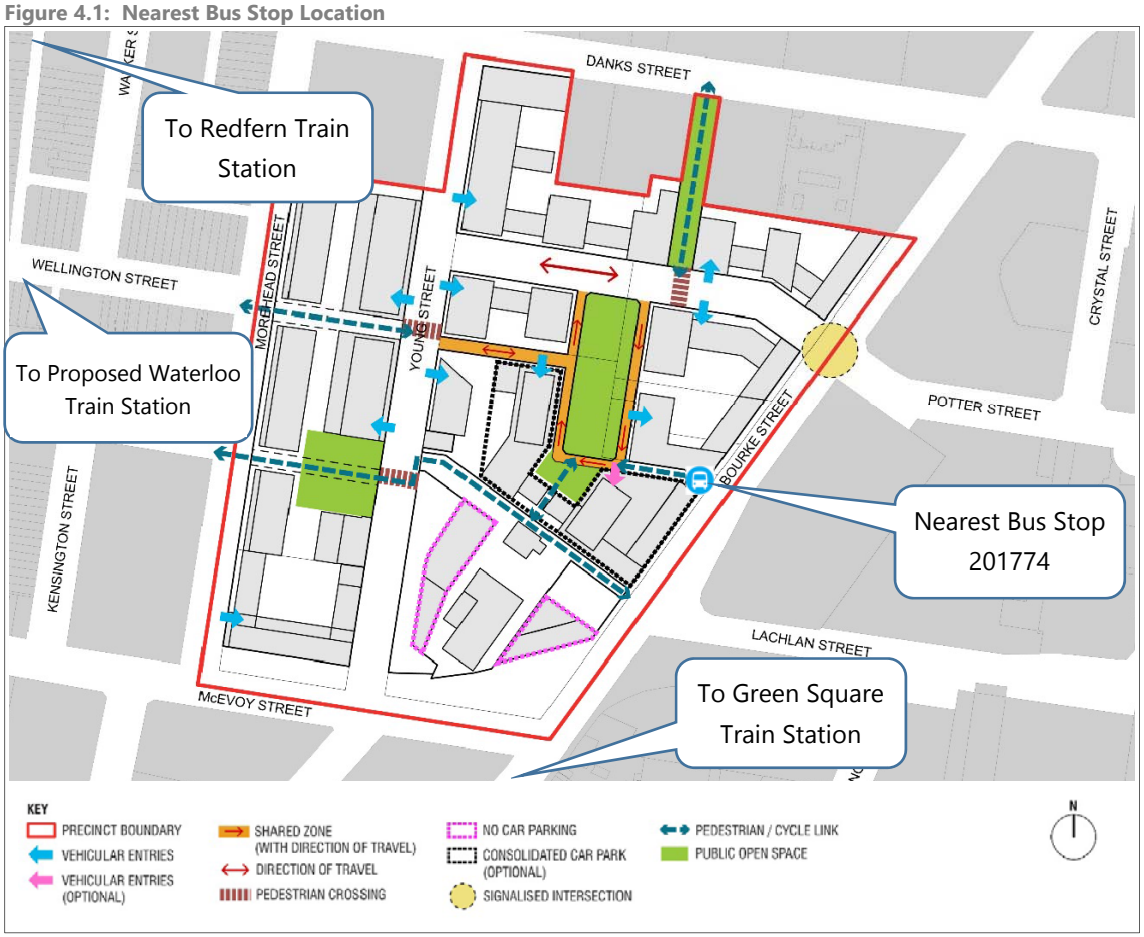
The suitability of the indicative proposed loading and emergency vehicle arrangements is discussed in Section 5 of this report.

4. Sustainable Transport Impacts and Main Street Design Review

4.1 Public Transport

As identified in Figure 2.9, the nearest train stations are Green Square (approximately 1km walking distance) and Redfern (approximately 1.5km walking distance). The nearest bus stop to the site is located on Bourke Street between Lachlan Street and Potter Street. The nearest bus stop in relation to the site and the directions of the nearest train stations are shown in Figure 4.1.

Figure 4.1: Nearest Bus Stop Location



Access to the nearest bus stop is provided by a pedestrian / cycle link. This provides access to the centre of the site and central park. Access is also provided to the western side of the study area via pedestrian zebra crossings and pedestrian / cycle links to Morehead Street. The proposed layout and pedestrian connectivity is considered a good outcome for the study area and also for existing areas to the west of Morehead Street.

Access to Green Square Station is facilitated by good pedestrian links to the intersection of Bourke Street / Lachlan Street / McEvoy Street.

The nearest bus stop, Bourke Street Opposite Lachlan Street, 201774 is shown in Figure 4.2. Routes 301, 302, 303 and M20 stop at this stop.

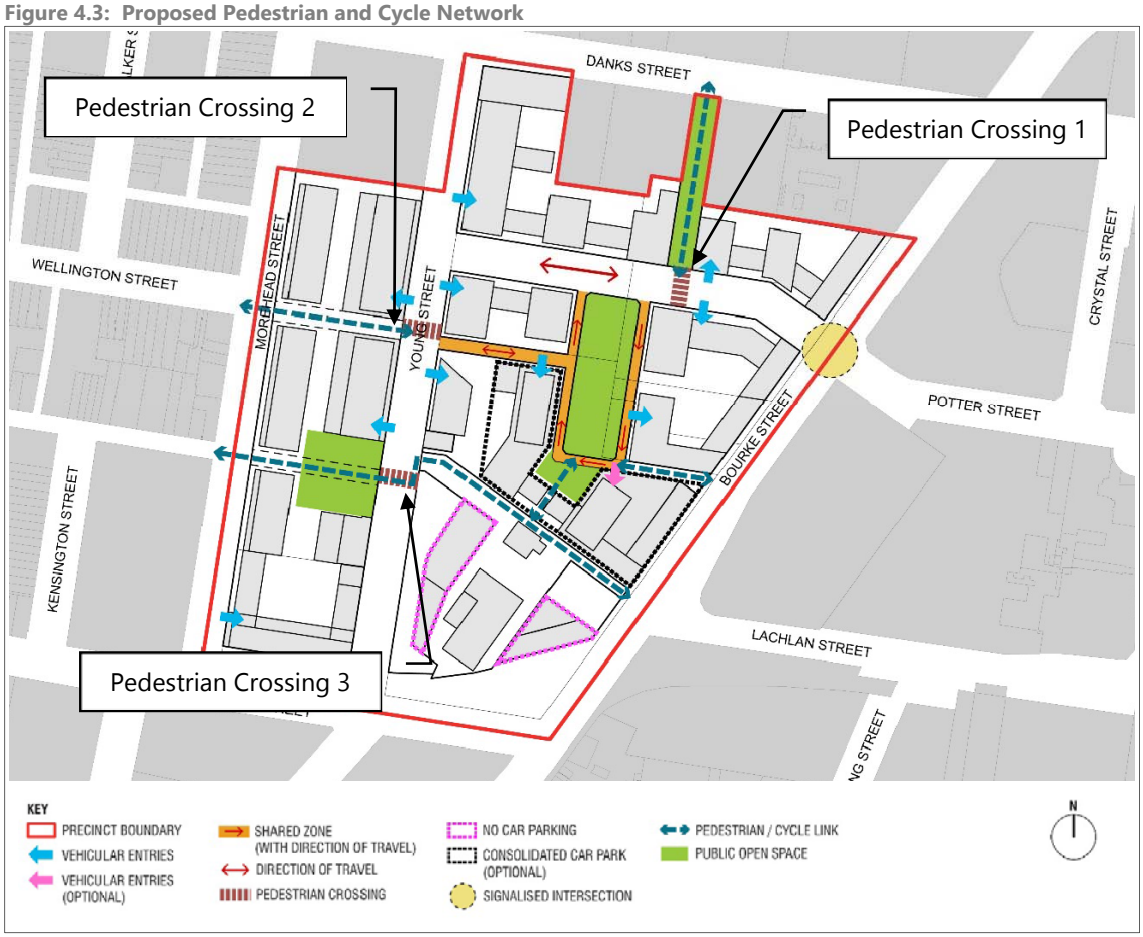
Figure 4.2: Existing Bus Stop 201774 (Google Street View December 2016)

Figure 4.2 indicates that a seat and a bin are provided at the existing bus stop. It is recommended that the City of Sydney upgrade the bus stop as part of the upgrade for the area to provide shelter and bicycle parking as Figure 4.2 shows a bicycle parked against the fence which indicates that there is a need for bicycle parking at this bus stop.

4.2 Cycling Network

The existing cycle network is provided in Figure 2.10 and shows a separated cycle way on Bourke Street north of Phillip Street and south of Green Square Station. The existing cycle network also shows a route along Wellington Street and Potter Street. The proposed masterplan is shown in shown in Figure 4.3.

Figure 4.3: Proposed Pedestrian and Cycle Network



The proposed site provides a new east-west connection between Potter Street and Young Street and also provides a connection from Wellington Street through to Potter Street. The proposed cycle network improves the permeability of the cycle network and is considered a good outcome for the area.

In November 2013, the City of Sydney finished consultation on a section of the Bourke Street cycleway extension between Phillip Street and Green Square[4]. Stage 1 of the project has been completed and Stage 2 is soon to commence.

4.3 Pedestrian Network

A number of pedestrian through site connections are proposed as part of the masterplan. The proposed additional through site links are considered satisfactory and no additional site links are considered necessary.

4.3.1 Proposed Pedestrian Connections

Additional pedestrian connections are proposed as shown in Figure 4.4.

[4] http://www.cityofsydney.nsw.gov.au/__data/assets/pdf_file/0009/244827/Concept_Design_-_Bourke_Street_Waterloo_Shared_Path.pdf

Figure 4.4: Proposed Pedestrian and Cycle Through Links

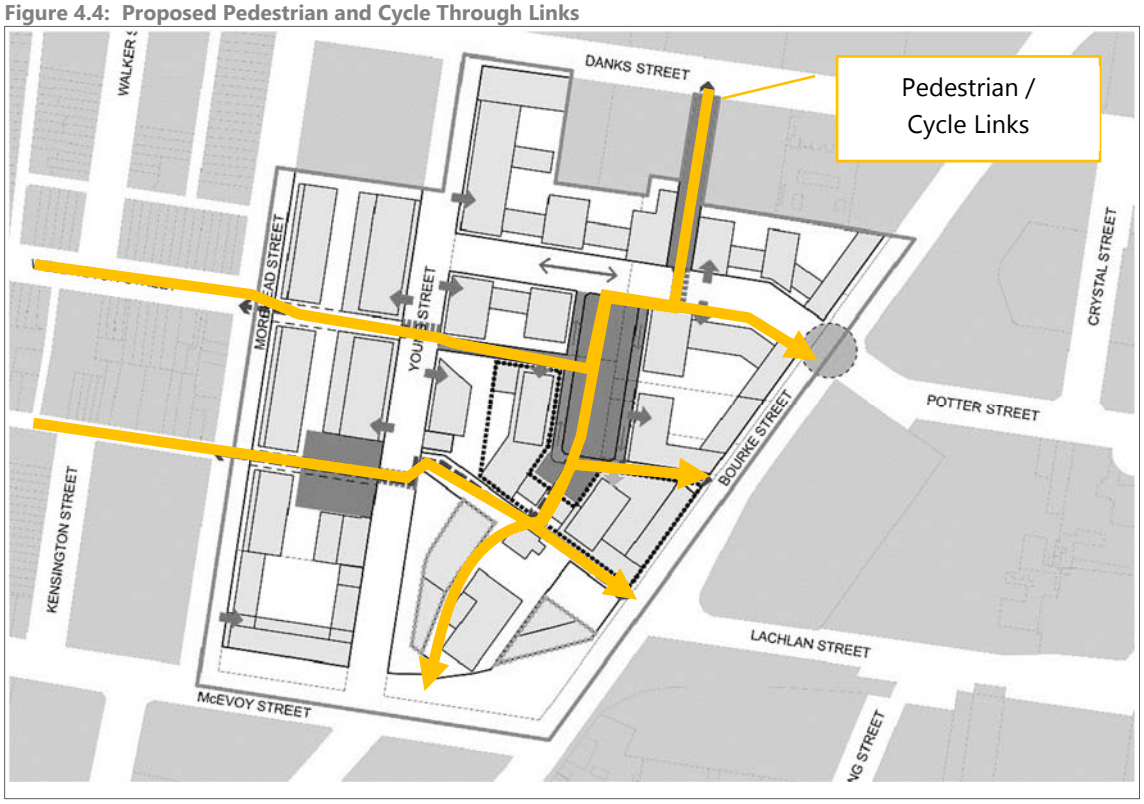
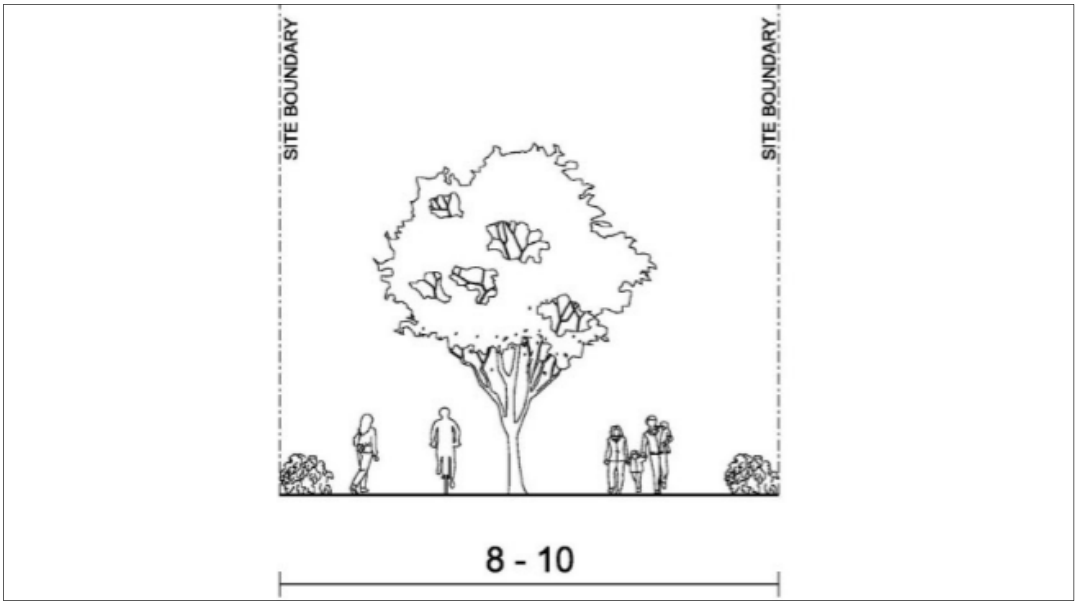


Figure 4.4 indicates that there are connections east-west and north-south through the site. This provides improved pedestrian / cycle connectivity and is considered a satisfactory outcome for the study area.

The proposed cross section of the through pedestrian/ cycle links is shown in Figure 4.5.

Figure 4.5: Proposed Through Site Link Cross-Section



The proposed cross-sections of the through site links are 8m to 10m wide. This provides sufficient width for either separate or combined pedestrian and cycle areas. The final design will be determined at a later stage.

4.3.2 Proposed Pedestrian Zebra Crossings

Three pedestrian zebra crossings are proposed within the study area as follows:

(1) Danks Street between Bourke Street and Young Street
(2) Young Street between the proposed Main Street and the proposed two-way shared zone
(3) Young Street between McEvoy Street and the proposed two-way shared zone.

Each of the proposed pedestrian crossings are assessed in the following sections.

Pedestrian Crossing 1

The proposed pedestrian crossing is opposite a pedestrian connection which provides access between Danks Street and the proposed Main Street and is shown in Figure 4.6.

Figure 4.6: Proposed Pedestrian Crossing 1

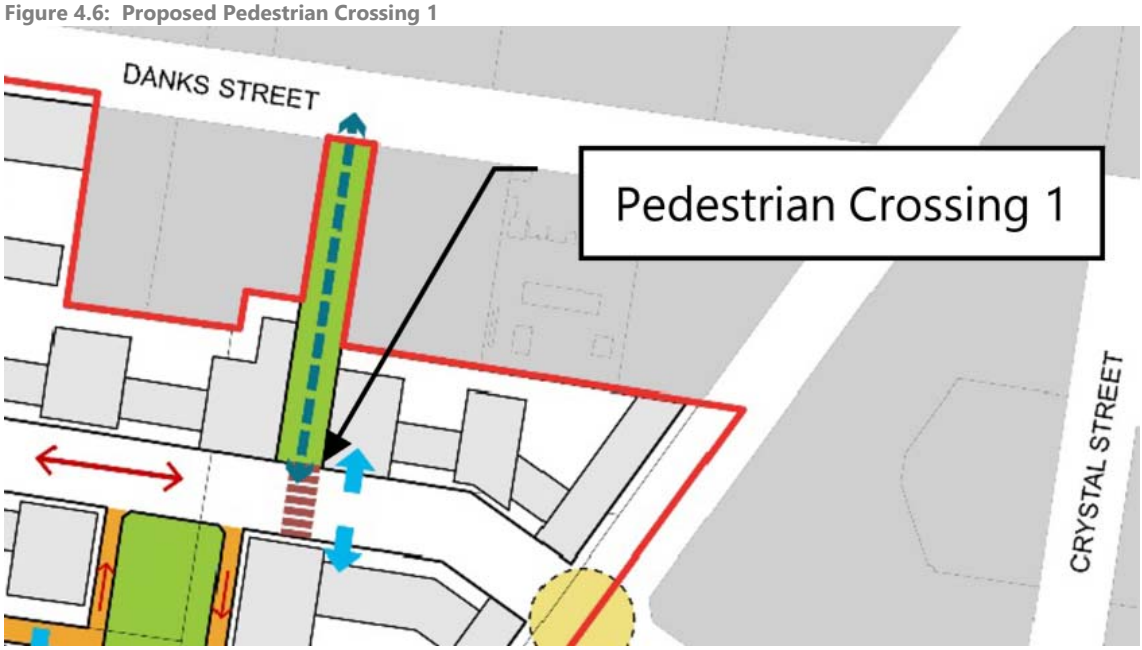


Figure 4.6 indicates that the proposed pedestrian crossing is relatively close to the proposed driveway locations and the interaction between the two locations will need to be reviewed in more detail at a later stage. Based on the width of the proposed Main Street, the City of Sydney should consider providing kerb extensions on either side of the pedestrian crossing. To promote a slow speed environment and to provide better pedestrian facilities in Main Street, it is recommended that the pedestrian crossing is raised.

Proposed Pedestrian Crossing 2

The proposed pedestrian crossing is opposite a pedestrian connection which provides access between Wellington Street and Young Street and is shown in Figure 4.7.

Figure 4.7: Proposed Pedestrian Crossing 2

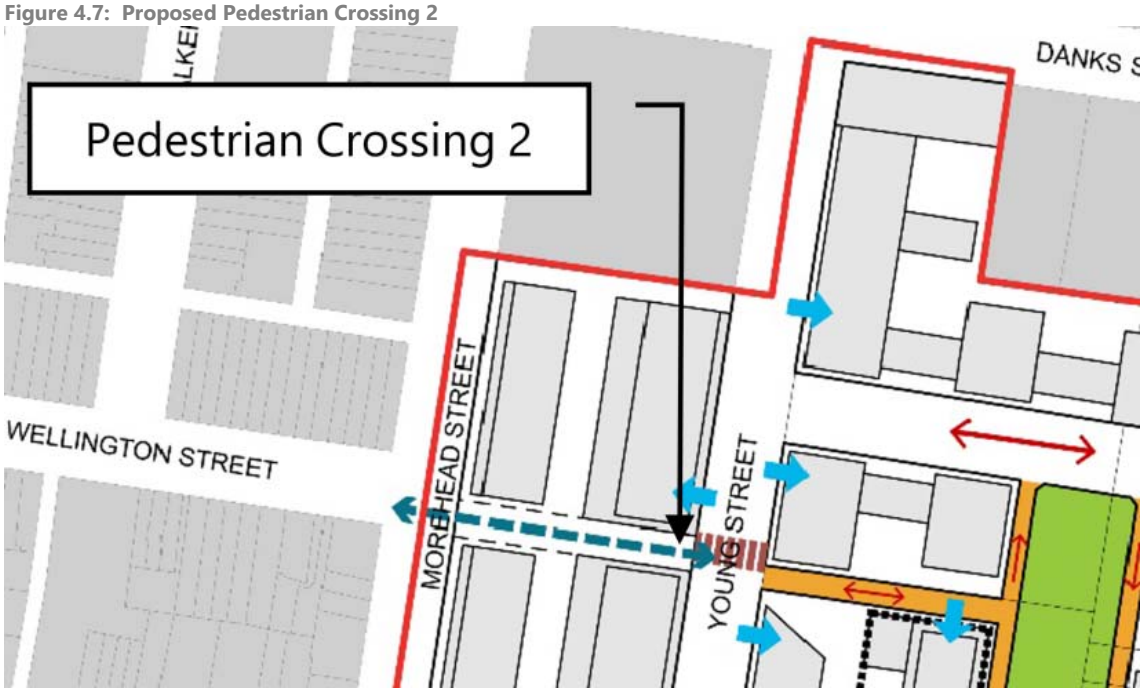


Figure 4.7 indicates that the proposed pedestrian crossing is relatively close to the proposed driveway locations and the proposed two-way shared zone. The interaction between the two locations will need to be reviewed in more detail at a later stage. Based on the width of Young Street, the City of Sydney should consider providing kerb extensions on either side of the pedestrian crossing. To promote a slow speed vehicle environment in Young Street and to provide better pedestrian facilities, it is recommended that the pedestrian crossing is raised.

Proposed Pedestrian Crossing 3

The proposed pedestrian crossing is opposite a pedestrian connection which provides access between Wellington Street and Young Street and is shown in Figure 4.8.

Figure 4.8: Proposed Pedestrian Crossing 3

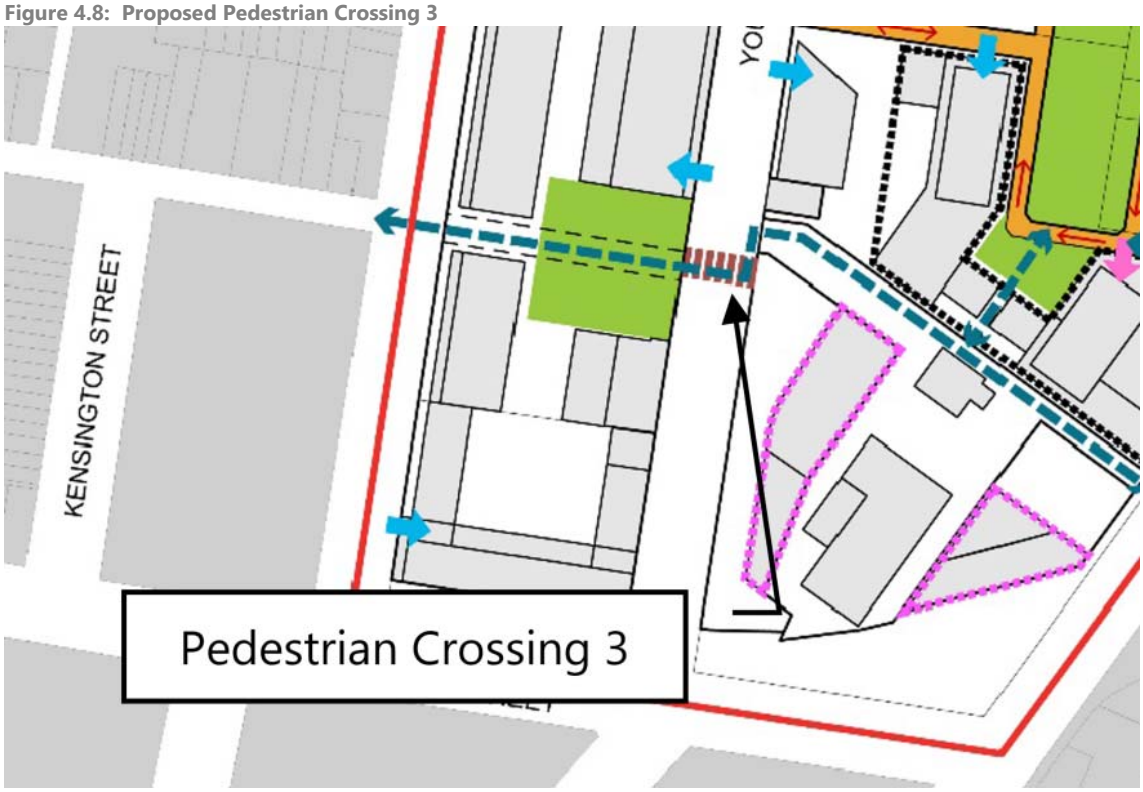


Figure 4.8 indicates that the proposed pedestrian crossing is relatively close to the proposed driveway location on the western side of Young Street. The interaction between the two locations will need to be reviewed in more detail at a later stage. Based on the width of Young Street, the City of Sydney should consider providing kerb extensions on either side of the pedestrian crossing. To promote a slow speed vehicle environment in Young Street and to provide better pedestrian facilities, it is recommended that the pedestrian crossing is raised.

4.3.3 Proposed Shared Zone Assessment

A one-way shared zone is proposed around a central park with ingress and egress to and from the new Main Street running east-west through the study area. The shared zone continues and provides two-way connection to Young Street. PeopleTrans has assessed the likely traffic volume on the sections of the shared zone based on the likely traffic generation and vehicle access locations. The anticipated volume of vehicles during different peak hours is summarised is Table 4.1.

Table 4.1: Summary of Anticipated Future Shared Zone Traffic Volumes

Peak Hour	Anticipated Hourly Vehicle Volume		
	In at Main Street	Out to Main Street	In / Out at Young Street
Weekday AM	15	19	25
Weekday PM	17	16	24
Saturday Midday	24	24	36

Advice on the maximum traffic volumes for a shared zone have been sought from the Roads and Maritime Services Technical Direction *TTD 2016/001 February 2016, Design and implementation of shared zones including provision for parking*. The technical direction states that "*A shared zone is a*

road or network of roads or a road related area where space is shared safely by vehicles and pedestrians and where pedestrian priority and quality of life take precedence over ease of vehicle movement."

The technical direction does not specify a maximum traffic volume and the final design of the shared zone with an emphasis on low speed is more important than the hourly traffic volume. The technical direction does however state that a shared zone will only be considered *"where there are very low numbers of slow moving vehicles".*

The final layout of the shared zones will be subject to detailed design and should contain the following elements and all requirements from the technical direction:

- Different road environment / pavement so that it does not look like a normal road.
- Any delineation and kerbs shall be removed to enhance the sense of pedestrian priority.
- Regulatory traffic signs as per the requirements of the NSW Road Rules 2008 are required.

It is recommended that as part of the detailed design of the shared zone (Category 1), that City of Sydney consider continuous footpath treatments as per TD 2013/05.

Impact of Construction Staging on the Shared Zone

The combined vehicle volume in Table 4.1 indicates that a combined vehicle volume during the Saturday peak hour could reach approximately 84 vehicles per hour, two-way. This equates to approximately 1 vehicle every 42 seconds (two-way). As previously indicated, the RMS technical direction does not specify a maximum volume for shared zones and subject to the design of the shared zone promoting a low speed environment, this volume is considered satisfactory.

4.4 Proposed Main Street Cross-Section

The proposed Main Street cross-section is provided in Figure 4.9.

Figure 4.9: Proposed Main Street Cross-Section

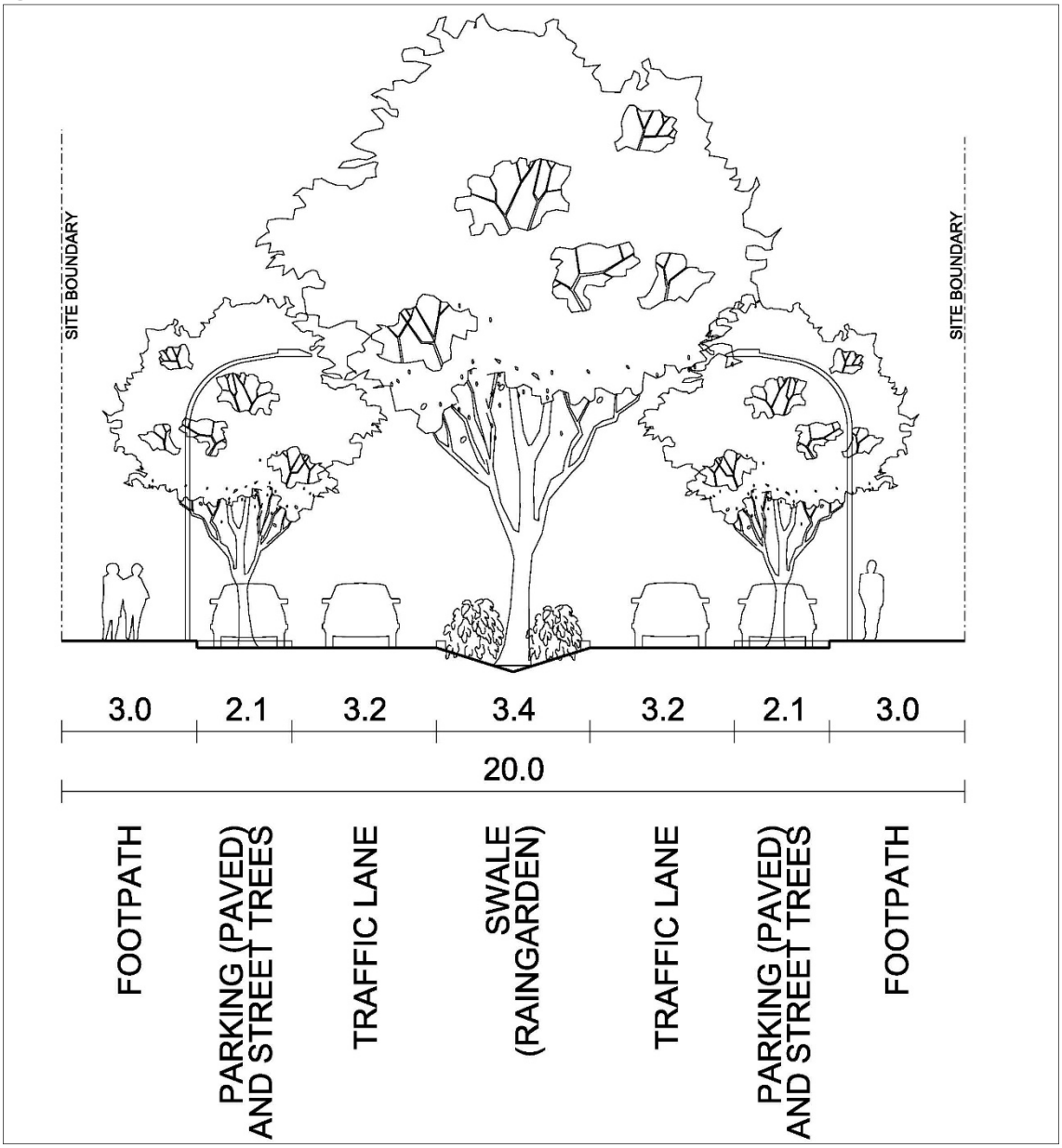


Figure 4.9 indicates that parking is proposed on both sides of the carriageway. The width of these spaces meets the Australian Standards for On-Street Car Parking. A travel lane in each direction is proposed 3.2m wide. This width complies with the NSW Bicycle Guidelines which states that *"lanes with a critical width of 3.3m to 3.7m should not be used"*. It also complies with the Austroads Guide to Road Design Part 3: Geometric Design, Table 4.3.

The proposed footpath widths are considered satisfactory.

5. Service and Emergency Arrangements

5.1 Loading and Waste Collection Arrangements

Loading arrangements for each development site will need to be considered as part of the detailed design of each site. Provision will need to be made for delivery vehicles such as furniture removal vehicles to access each site.

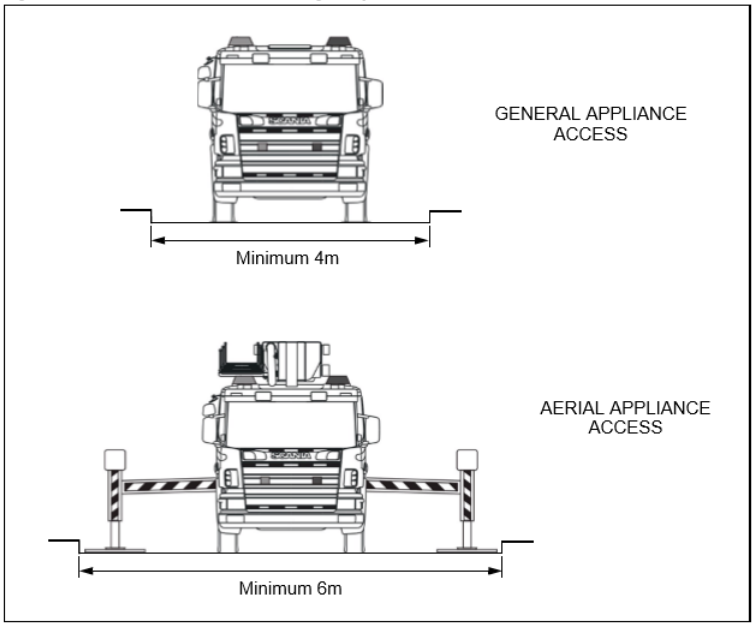
The Sydney DCP 2012 will require specific loading requirements for each development. Information on turning radii and design parameters for City of Sydney garbage trucks is provided within the City of Sydney DCP 2012 Section 3.11.13. This document nominates a minimum driveway width of 3.6m and provides information on the maximum driveway gradients. The DCP requires that a 9.25m waste vehicle can be accommodated. It is recommended that this be considered as part of the detailed design of the shared zone.

5.2 Emergency Vehicle Access

Information on the minimum emergency vehicle access paramaters have been sought from *NSW Fire Brigades Policy No. 4 Guidelines for Emergency Vehicle Access.*

The document nominates minimum widths for straight sections of carriageway which are reproduced as Figure 5.1.

Figure 5.1: Guidelines for Emergency Vehicle Access



It is recommended that these Guidelines are considered as part of the detailed design of the shared zone.

6. Traffic Impacts

6.1 Existing Traffic Modelling

The operation of the key intersections within the study area have been assessed using Sidra Intersection[5], a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by RMS, is vehicle delay. Sidra Intersection determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 6.1 shows the criteria that Sidra Intersection adopts in assessing the level of service.

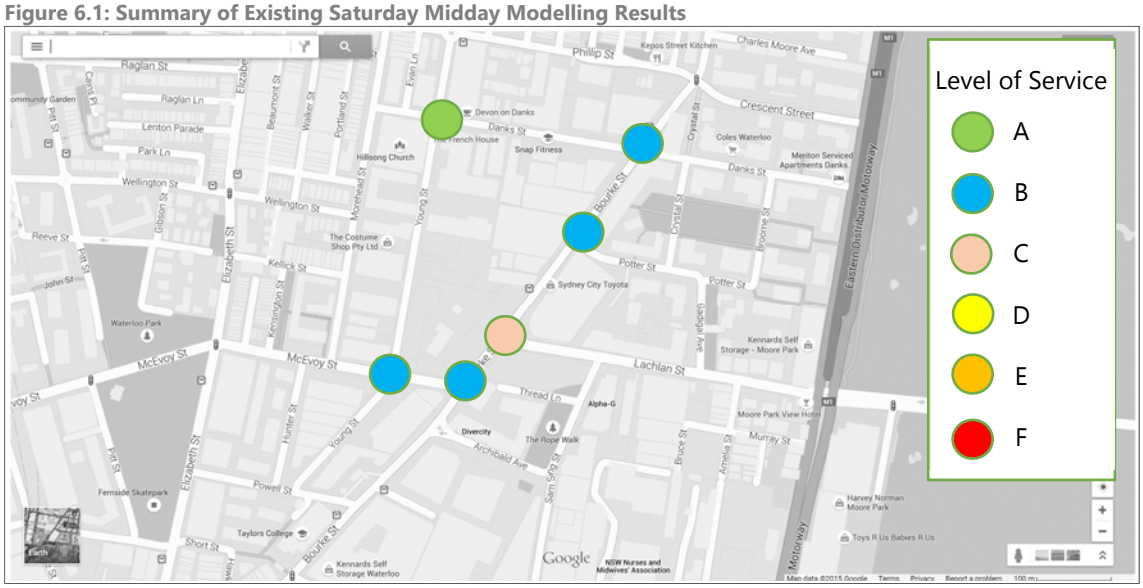
Table 6.1 RMS Sidra Intersection Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	0 to 14.5	Good operation	Good operation
B	14.5 to 28.5	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	28.5 to 42.5	Satisfactory	Satisfactory, but accident study required
D	42.5 to 56.5	Near capacity	Near capacity, accident study required
E	56.5 to 70.5	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70.5	Extra capacity required	Extreme delay, major treatment required

Table 6.1 presents a summary of the existing operation of the intersection, with full results presented in Appendix A of this report.

[5] Program used under license from Akcelik & Associates Pty Ltd.

Figure 6.1: Summary of Existing Saturday Midday Modelling Results



6.2 Existing Traffic Generation

PeopleTrans used the existing land use floor areas provided by the City of Sydney as summarised in Table 2.1 and has estimated the existing traffic generation of all sites in the study area. A summary of the existing traffic generation for the study are is provided in Table 6.2.

Table 6.2: Summary of Existing Study Area Traffic Generation

Address	Major Land Use	Existing Major Land Use Traffic Generation		
		AM Peak Period	PM Peak Period	Saturday Midday
207-229 Young Street	Industry - business parks	83.5	83.5	45.9
881-885 Bourke Street	Industry - warehouse	19.2	19.2	9.6
887-893 Bourke Street	Lawrence Dry Cleaners	29	38	46
895-899 Bourke Street	Industry - warehouse	11.0	11.0	5.5
901 Bourke Street	Industry - warehouse	10.4	10.4	5.2
198-222 Young Street	Industry - business parks	124.1	124.1	62.0
224-228 Young Street	Industry - warehouse	7.7	7.7	0.0 (closed)
230-234 Young Street	Industry - warehouse (Vehicle Repairs)	9.1	9.1	0.0 (closed)
Total		**294**	**303**	**174**

Table 6.2 indicates that the existing study area generates approximately 300 vehicle movements during the weekday AM and PM peak hours and 174 vehicle movements during the Saturday midday peak hour. The traffic generation rates were sourced from a combination of the RMS Guide to Traffic Generating Developments, a survey of existing land use where the traffic surveys could observe existing driveways and a comparison of car parking demand on weekdays and Saturdays.

6.3 Future Traffic Generation

Estimates of the future peak hour traffic volumes resulting from the proposed development within the study area are set out in Table 6.3 and Table 6.4.

Table 6.3: Anticipated Future Traffic Generation Rates

Future Traffic Generation Rates				Source
Residential	AM	0.14	movements / space	RTD 04a High Density Dwellings, Sites, 1, 2, 3, 4, 5, 7, 10
	PM	0.1	movements / space	RTD 04a High Density Dwellings, Sites, 1, 2, 3, 4, 5, 7, 10
	Sat	0.21	movements / space	RTD 04a High Density Dwellings, Sites, 1, 2, 3, 4, 5, 7, 10
Commercial	AM	1.95	vehicles / 100m2 GFA	RTD 04a
	PM	1.3	vehicles / 100m2 GFA	RTD 04a
	Sat	0.1	vehicles / 100m2 GFA	PeopleTrans estimate based on likely use
Retail	AM	1.7	vehicles / 100m2 GFA	RMS Guide to traffic generating developments update, Halcrow 2011
	PM	3.4	vehicles / 100m2 GFA	RMS Guide to traffic generating developments update, Halcrow 2011
	Sat	3.8	vehicles / 100m2 GFA	RMS Guide to traffic generating developments update, Halcrow 2011

Table 6.4: Anticipated Future Traffic Generation

Use	Size	Unit	AM Generation	PM Generation	Sat Generation
Residential Dwellings	1,460	Dwellings	132	94	198
Commercial	1,782	m2 GFA [1]	35	23	2
Retail	2,673	m2 GFA [1]	45	91	102
Total			**212**	**208**	**302**
Difference vs Existing			**-82**	**-95**	**+128**

[1] Estimate only, subject to change

Table 6.3 and Table 6.4 indicates that the anticipated future traffic generation of the study area is less than the existing study area generation for the weekday AM and weekday PM peak hours. The traffic generation for the future Saturday Midday peak hour is anticipated to increase by 128 vehicles per hour or approximately 2 vehicles per minute.

The residential traffic generation rates have been sourced from RMS surveys undertaken in 2012 on high density residential sites that are close to public transport and almost exclusively residential in nature. Sites 1, 2, 3, 4, 5, 7 and 10 were selected as they were part of major town centres within Sydney and Site 6 in Liberty Grove was excluded as it was not considered sufficiently representative of the Danks Street South precinct.

6.4 Proposed Access Locations

A total of 10 vehicle access locations are proposed to service the study area. One vehicle access location is proposed to Morehead Street outside of the study area however to provide a conservative assessment of the traffic volume at the study area intersections analysed, it is assumed that the access to these apartments is provided from Young Street.

The proposed access locations are shown in Figure 6.2.

Figure 6.2: Proposed Masterplan Access Locations

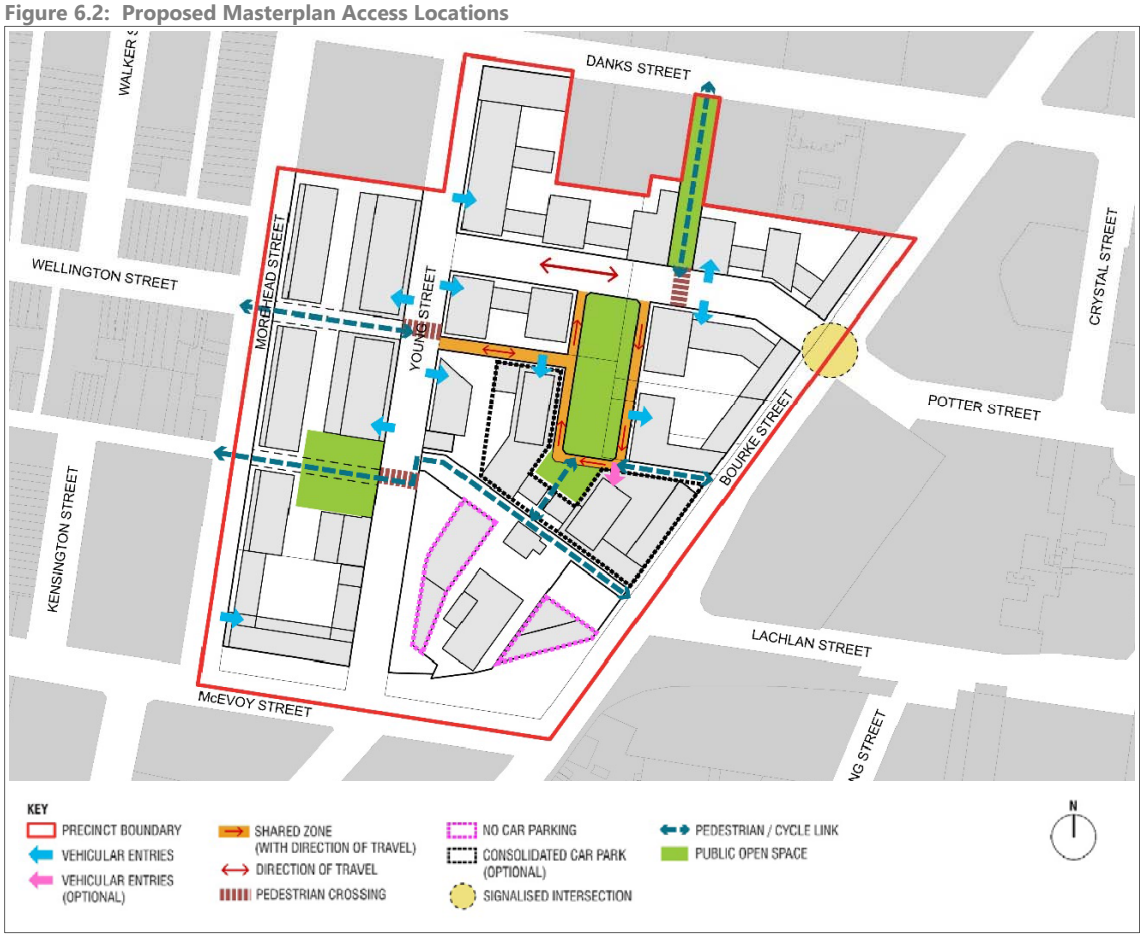


Figure 6.2 indicates the following:

- 5 proposed access locations from Young Street
- 2 proposed access locations from Main Street
- 3 proposed access locations (1 Optional) from the Shared Zone
- 1 proposed access from Morehead Street.

The final location of each proposed access location will need to accord with the relevant Australian Standards and the City of Sydney DCP with regard to sight distance and proximity to intersections. This will be undertaken as part of the detailed design of the area and each development site.

6.5 Distribution and Assignment

The directional distribution and assignment of traffic generated by the proposed development will be influenced by a number of factors, including the:

(1) configuration of the arterial road network in the immediate vicinity of the site
(2) existing operation of intersections providing access between the local and arterial road network
(3) distribution of households in the vicinity of the site
(4) surrounding employment centres, retail centres and schools in relation to the site
(5) likely distribution of employee's residences in relation to the site
(6) configuration of access points to the site.

Having consideration to the above, for the purposes of estimating vehicle movements, the following directional distributions have been estimated based on the available BTS data identifying place of work and place of residence for the existing study area and immediate surrounds.

Based on the above, to Figure 6.5 have been prepared to show the estimated marginal increase in turning movements in the vicinity of the subject property following full site development.

As no increase in the surrounding road network traffic volume is anticipated during the weekday AM and PM peak hours, in order to provide a conservative assessment, no reduction has been assumed to the existing traffic volumes and the anticipated development volumes have been added to the existing traffic volumes.

Figure 6.3: Future AM Peak Hour Volumes

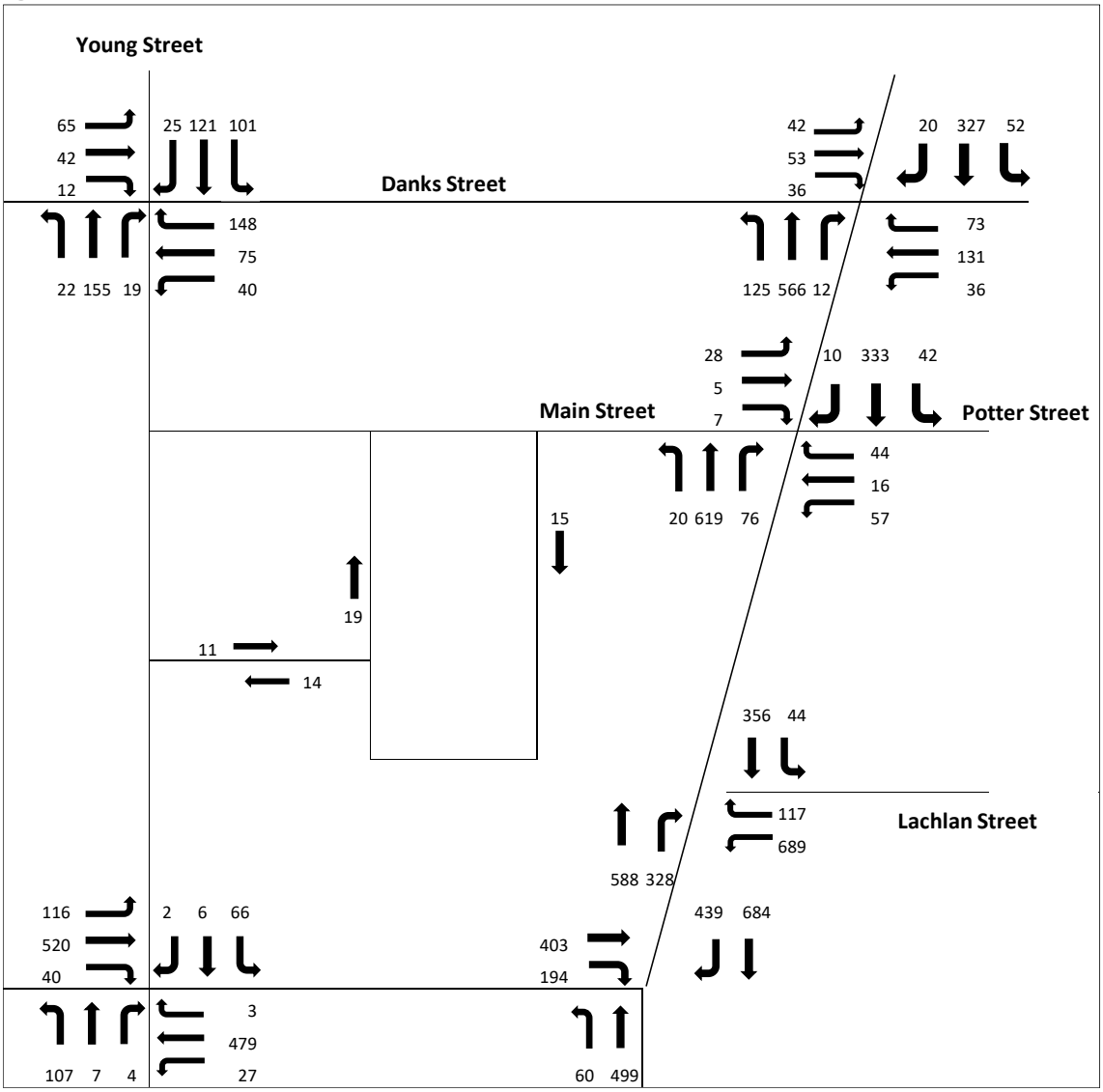


Figure 6.4: Future PM Peak Hour Volumes

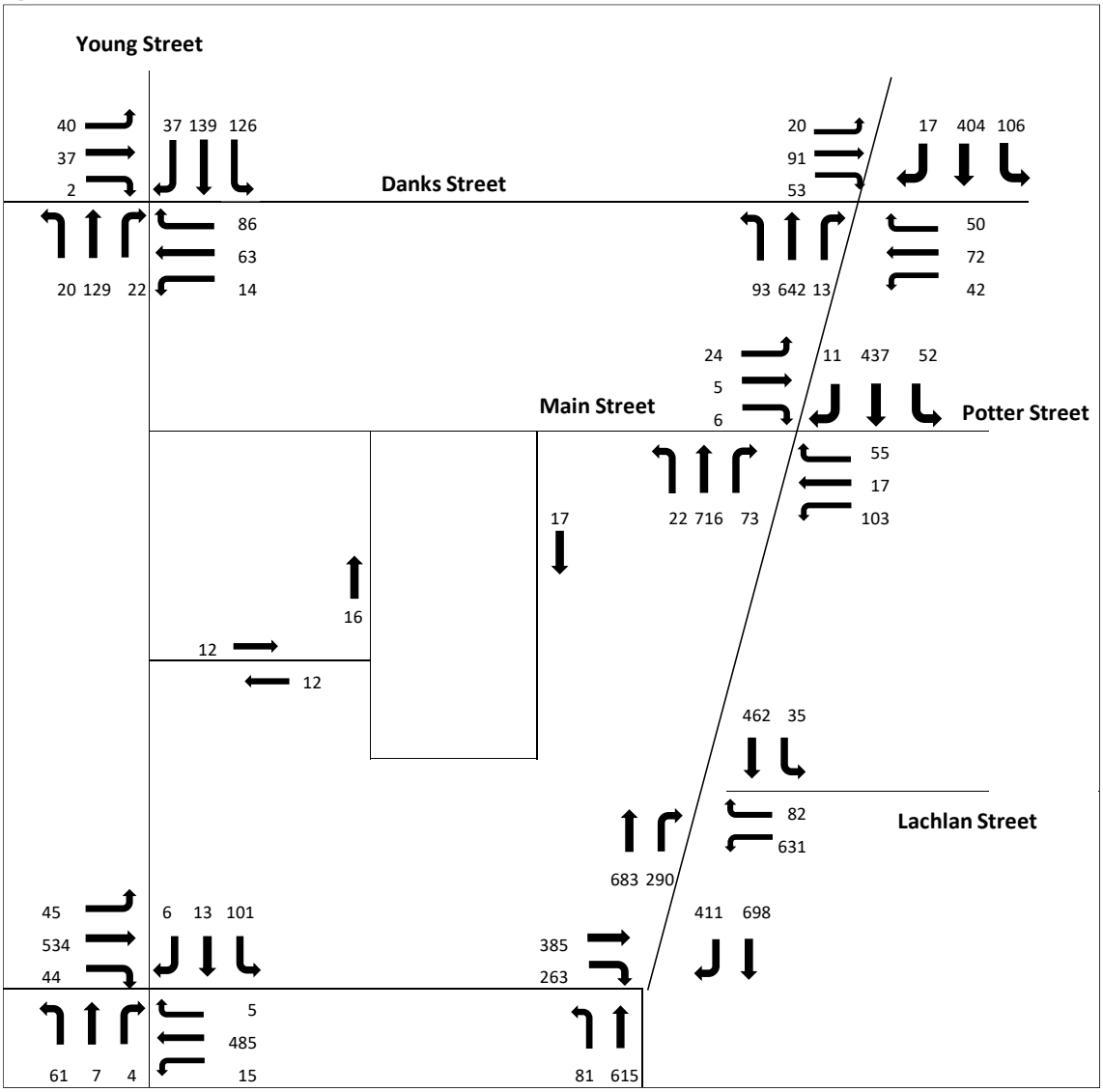
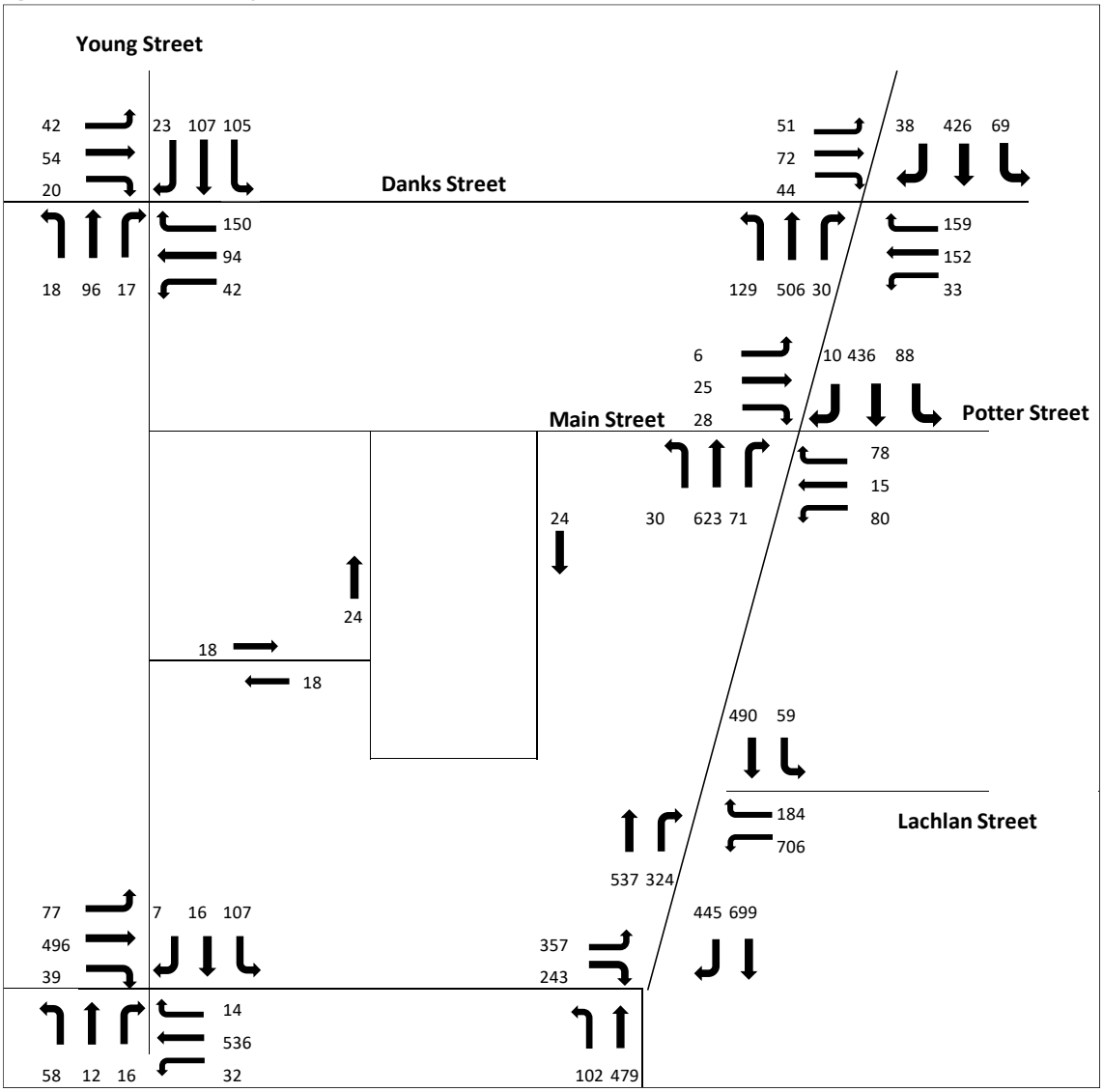


Figure 6.5: Future Saturday Peak Hour Traffic Volumes



6.6 Transport Impact Assessment

As the anticipated future traffic generation is lower than the existing situation (Table 6.4), only the intersection of Bourke Street / Potter Street / Main Street has been assessed for the weekday AM and PM peak hours. The existing T-intersection is proposed to be converted to a four-way cross intersection.

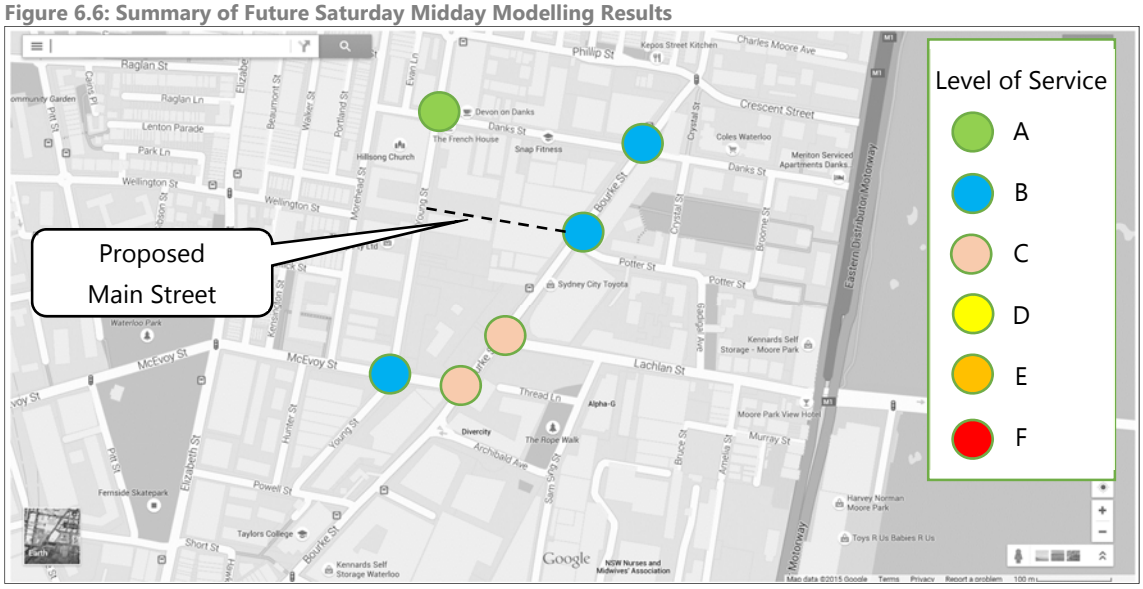
In order to provide a conservative assessment and to account for circulating traffic and general background traffic, the anticipated future traffic volumes turning into and out of Main Street were doubled.

As the lane configuration of Main Street has not been specified in the proposed Masterplan. Main Street has been modelled with two lanes on the approach and one on the exit. The modelled layout of the intersection is shown in Section 6.7.

The results of the modelling suggest that the intersection is likely to operate at Level of Service B during both AM peak hour and PM peak hour for a typical weekday. Although the intersection operational performance in the AM peak hour has reduced from Level of Service A, the intersection is still expected to perform adequately and support the proposed development of the Masterplan.

The full study area has been assessed for the Saturday midday peak hour. The results are summarised in the Figure 6.6 with full results provided in Appendix A.

Figure 6.6: Summary of Future Saturday Midday Modelling Results



A comparison of the intersection operational performance during Saturday midday peak hour between the existing and the proposed is summarised in Table 6.5.

Table 6.5: Intersection Operational Performance Comparison between the Existing and the Proposed

Intersection	Existing Operational Performance	Anticipated Future Operational Performance
Bourke Street / Danks Street	B	B
Bourke Street / Potter Street (Main Street)	B	B
Bourke Street / Lachlan Street	C	C
Bourke Street / McEvoy Street	B	C
Young Street / McEvoy Street	B	B
Young Street / Danks	A	A

Table 6.5 indicates that the intersections within the study area, with the exception of the Bourke Street / McEvoy Street intersection, are expected to maintain their current Level of Service. Although the Bourke Street / McEvoy Street intersection is expected to reduce from Level of Service B to Level of Service C, it is still expected to perform adequately and support the proposed development of the Masterplan.

The most important intersections in the study area are the intersections of Bourke Street / Lachlan Street and Bourke Street / McEvoy Street. A summary of the anticipated additional vehicle volumes travelling through these intersections in the three assessed peak hours is summarised in Table 6.6.

Table 6.6: Summary of Additional Peak Hour Traffic at Bourke Street / Lachlan and Bourke Street / McEvoy

Peak Hour	Anticipated Additional Vehicle Volume
AM	28 [1]
PM	29 [1]
Saturday	68

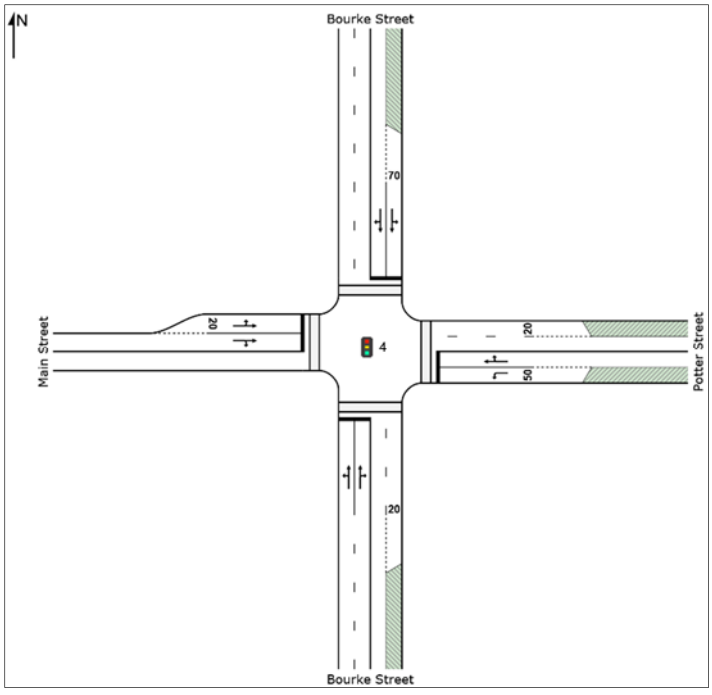
[1] Overall, traffic is anticipated to be lower in the entire study area in the future during the AM and PM peak hours. This anticipated traffic assumes that the two intersections maintain their current level of traffic.

Table 6.6 indicates that approximately 1 additional vehicle every 2 minutes is expected to pass through the intersection of Bourke Street / Lachlan Street and Bourke Street / McEvoy Street. On a future Saturday peak hour, approximately, an additional vehicle every minute is expected to be generated by the study area and travel through the identified intersections. This is not expected to result in a significant impact on the two intersections.

6.7 Proposed Layout of the Intersection of Bourke Street / Potter Street / Main Street

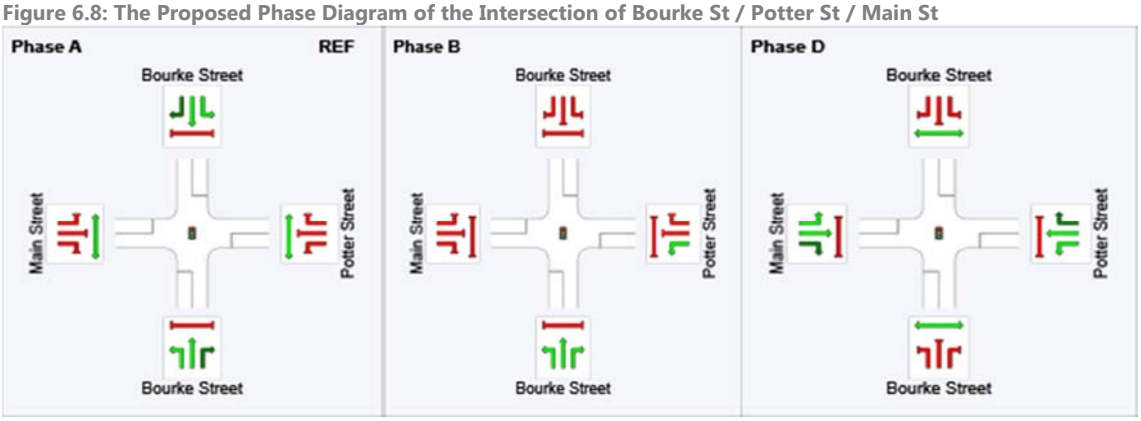
The proposed layout for the added Main Street leg at the intersection of Bourke Street / Potter Street / Main Street is indicated in Figure 6.7. This layout is expected to provide a balance between satisfactory operational performance on Main Street and maintaining the current operational performance of Bourke Street.

Figure 6.7: Indicative Layout of the Intersection of Bourke St / Potter St / Main St



The signal phasing arrangement adopted in the modelling was similar to the existing signal phasing arrangement in that the existing 3-phase arrangement was maintained and new movements from/to the Main Street leg were added to Phase D. The phase diagram is shown in Figure 6.8.

Figure 6.8: The Proposed Phase Diagram of the Intersection of Bourke St / Potter St / Main St



The modelling results show that the above arrangement of Main Street at the intersection is expected to provide sufficient capacity for the proposed Masterplan development and the intersection is likely to maintain its current operational performance.

7. Conclusions and Recommendations

Based on the analysis and discussions presented within this report, the following conclusions are made:

(1) The proposed development within the study area is likely to generate less traffic during the weekday AM (82 less vehicle movements) and PM (95 less vehicle movements) peak hours with a higher volume on a Saturday midday peak hour (128 more vehicle movements).

(2) The proposed pedestrian network is considered satisfactory subject to the detailed design of the crossing locations.

(3) It is recommended that each proposed pedestrian crossing within the study area be raised to promote a low speed vehicle environment and to provide priority to pedestrians and cyclists.

(4) It is recommended that as part of the detailed design of the shared zone, that City of Sydney implement continuous footpath treatments (Category 1) as per TD 2013/05.

(5) Depending on the proposed staging of the development of the area, the use of the Shared Zone from Young Street to access all parking within the Shared Zone is considered satisfactory subject to appropriate design and slow speed environment within the shared zone.

(6) It is recommended that refuse collection and emergency access be considered as part of the detailed design of the shared zone.

(7) The addition of Main Street to the intersection of Bourke Street / Potter Street is expected to maintain the existing Level of Service of the intersection. In order to provide a conservative assessment, PeopleTrans doubled the anticipated volumes entering and exiting Main Street during the weekday AM, PM and Saturday peak hours.

(8) A two-lane approach with one exit lane should be reserved at the eastern end of Main Street based on the layout identified in Figure 6.7.

(9) All modelled intersections on the surveyed Saturday are expected to maintain the same Level of Service following full development of the study area with the exception of the intersection of Bourke Street / McEvoy Street which is expected to reduce its Level of Service from B to C which is considered satisfactory. However, it is noted that at the time of writing that information on the impacts of WestConnex or the Alexandria to Moore Park Connectivity Upgrade were available.

7.1 References

In preparing this report, reference has been made to the following:

- A number of inspections of the study area in 2015 and 2017.
- Sydney Council Development Control Plan (DCP)
- traffic and car parking surveys as referenced in this report
- plans for the proposed development prepared by the City of Sydney
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004

- Australian Standard, Parking Facilities, Part 2: Off-Street Commercial Vehicle Facilities AS 2890.2:2002
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- other documents and data as referenced in this report.

Appendix A

Sidra Intersection Results

MOVEMENT SUMMARY

Site: 4 [4 Bourke / Potter AM 2015]

Network: N101 [AM 2015 - Young / Danks / Potter]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Potter
AM 2015
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Cycle Time - User-Given)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
2	T1	673	8.1	673	8.1	0.334	5.7	LOS A	6.1	46.0	0.37	0.35	31.6
3	R2	86	1.3	86	1.3	0.334	10.5	LOS A	5.2	38.1	0.38	0.42	33.9
Approach		759	7.3	759	7.3	0.334	6.2	LOS A	6.1	46.0	0.37	0.36	32.0
East: Potter Street													
4	L2	58	7.0	58	7.0	0.247	42.5	LOS C	2.4	17.6	0.93	0.74	14.5
6	R2	54	0.0	54	0.0	0.175	38.9	LOS C	2.1	14.7	0.89	0.73	9.3
Approach		112	3.6	112	3.6	0.247	40.7	LOS C	2.4	17.6	0.92	0.73	12.3
North: Bourke Street													
7	L2	52	4.8	52	4.8	0.057	8.3	LOS A	0.7	4.8	0.23	0.49	33.6
8	T1	358	5.4	358	5.4	0.262	4.3	LOS A	3.8	28.2	0.28	0.26	40.6
Approach		410	5.3	410	5.3	0.262	4.8	LOS A	3.8	28.2	0.27	0.29	39.6
All Vehicles		1282	6.4	1282	6.4	0.334	8.8	LOS A	6.1	46.0	0.38	0.37	30.2

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.9 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	136	39.4	LOS D	0.3	0.3	0.94	0.94
P2	East Full Crossing	31	8.0	LOS A	0.0	0.0	0.42	0.42
P3	North Full Crossing	32	39.3	LOS D	0.1	0.1	0.93	0.93
All Pedestrians		198	34.6	LOS D			0.86	0.86

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: 4 [4 Bourke / Potter PM 2015]

Network: N101 [PM 2015 - Young / Danks / Potter]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Potter
PM 2015
Signals - Fixed Time Coordinated Cycle Time = 106 seconds (Network Cycle Time - User-Given)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
2	T1	754	2.1	754	2.1	0.469	3.3	LOS A	11.1	78.7	0.33	0.31	36.8
3	R2	77	0.0	77	0.0	0.469	8.3	LOS A	11.1	78.7	0.37	0.35	37.7
Approach		831	1.9	831	1.9	0.469	3.7	LOS A	11.1	78.7	0.34	0.31	37.0
East: Potter Street													
4	L2	108	3.9	108	3.9	0.096	11.9	LOS A	2.2	15.9	0.42	0.61	27.6
6	R2	58	0.0	58	0.0	0.551	60.1	LOS E	3.2	22.1	1.00	0.77	6.5
Approach		166	2.5	166	2.5	0.551	28.7	LOS C	3.2	22.1	0.62	0.66	16.4
North: Bourke Street													
7	L2	55	0.0	55	0.0	0.511	32.0	LOS C	9.6	68.7	0.77	0.67	18.7
8	T1	455	4.1	455	4.1	0.511	27.4	LOS B	9.7	70.0	0.77	0.66	20.4
Approach		510	3.7	510	3.7	0.511	27.9	LOS B	9.7	70.0	0.77	0.66	20.2
All Vehicles		1507	2.6	1507	2.6	0.551	14.7	LOS B	11.1	78.7	0.51	0.47	24.3

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.1 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	26	47.2	LOS E	0.1	0.1	0.94	0.94
P2	East Full Crossing	23	36.6	LOS D	0.1	0.1	0.83	0.83
P3	North Full Crossing	8	47.2	LOS E	0.0	0.0	0.94	0.94
All Pedestrians		58	43.0	LOS E			0.90	0.90

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: 4 [4 Bourke / Potter Sat 2015]

Network: N101 [Sat 2015 - Young / Danks / Potter]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Potter
Sat 2015
Signals - Fixed Time Coordinated Cycle Time = 114 seconds (Network Cycle Time - User-Given)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
2	T1	656	1.6	656	1.6	0.479	6.2	LOS A	13.2	93.6	0.42	0.39	30.6
3	R2	75	0.0	75	0.0	0.479	11.9	LOS A	13.2	93.6	0.48	0.45	32.9
Approach		731	1.4	731	1.4	0.479	6.8	LOS A	13.2	93.6	0.42	0.39	30.9
East: Potter Street													
4	L2	84	0.0	84	0.0	0.096	20.9	LOS B	2.5	17.7	0.58	0.65	22.0
6	R2	82	0.0	82	0.0	0.420	56.8	LOS E	4.4	31.1	0.98	0.77	6.9
Approach		166	0.0	166	0.0	0.420	38.6	LOS C	4.4	31.1	0.78	0.71	12.8
North: Bourke Street													
7	L2	93	0.0	93	0.0	0.121	23.7	LOS B	2.5	17.6	0.51	0.66	20.8
8	T1	459	1.1	459	1.1	0.561	23.9	LOS B	16.4	116.1	0.70	0.62	22.3
Approach		552	1.0	552	1.0	0.561	23.9	LOS B	16.4	116.1	0.67	0.62	22.0
All Vehicles		1448	1.1	1448	1.1	0.561	16.9	LOS B	16.4	116.1	0.56	0.52	22.8

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.3 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	51.3	LOS E	0.2	0.2	0.95	0.95
P2	East Full Crossing	53	25.4	LOS C	0.1	0.1	0.67	0.67
P3	North Full Crossing	53	51.3	LOS E	0.2	0.2	0.95	0.95
All Pedestrians		158	42.6	LOS E			0.86	0.86

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: 5 [5 Bourke / Danks Sat 2015]

Network: N101 [Sat 2015 - Young / Danks / Potter]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Danks
Sat 2015
Signals - Fixed Time Coordinated Cycle Time = 114 seconds (Network Cycle Time - User-Given)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
1	L2	147	3.9	147	3.9	0.361	10.8	LOS A	5.9	42.5	0.32	0.43	27.4
2	T1	532	2.4	532	2.4	0.361	6.3	LOS A	5.9	42.5	0.32	0.37	34.5
3	R2	34	0.0	34	0.0	0.361	10.8	LOS A	5.8	41.6	0.33	0.32	35.2
Approach		713	2.6	713	2.6	0.361	7.4	LOS A	5.9	42.5	0.32	0.38	33.4
East: Danks Street													
4	L2	46	0.0	46	0.0	0.730	53.4	LOS D	11.5	81.3	0.98	0.88	10.5
5	T1	165	1.3	165	1.3	0.730	50.0	LOS D	11.5	81.3	0.98	0.88	10.5
6	R2	166	0.6	166	0.6	0.888	70.2	LOS E	10.7	75.1	1.00	1.05	10.9
Approach		377	0.9	377	0.9	0.888	59.3	LOS E	11.5	81.3	0.99	0.95	10.7
North: Bourke Street													
7	L2	88	2.9	88	2.9	0.077	11.2	LOS A	1.7	12.5	0.36	0.61	29.9
8	T1	416	2.4	416	2.4	0.385	7.3	LOS A	10.0	71.5	0.44	0.42	24.6
9	R2	38	0.0	38	0.0	0.385	11.9	LOS A	10.0	71.5	0.44	0.42	24.6
Approach		542	2.3	542	2.3	0.385	8.3	LOS A	10.0	71.5	0.43	0.45	26.2
West: Danks Street													
10	L2	68	2.0	68	2.0	0.326	56.2	LOS D	3.6	25.6	0.96	0.76	15.7
11	T1	84	2.8	84	2.8	0.805	61.0	LOS E	7.7	55.7	1.00	0.95	16.8
12	R2	46	4.5	46	4.5	0.805	64.3	LOS E	7.7	55.7	1.00	0.95	12.1
Approach		198	2.9	198	2.9	0.805	60.1	LOS E	7.7	55.7	0.99	0.88	15.5
All Vehicles		1829	2.2	1829	2.2	0.888	24.0	LOS B	11.5	81.3	0.56	0.57	18.9

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.3 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	89	46.7	LOS E	0.3	0.3	0.91	0.91
P2	East Full Crossing	95	8.1	LOS A	0.1	0.1	0.38	0.38
P3	North Full Crossing	298	47.1	LOS E	0.9	0.9	0.91	0.91
P4	West Full Crossing	84	8.1	LOS A	0.1	0.1	0.38	0.38
All Pedestrians		566	34.7	LOS D			0.74	0.74

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: 3 [3 Bourke / Lachlan Sat 2015]

Network: N101 [Sat 2015 - Lachlan / McEvoy / Young]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Lachlan
Sat 2015
Signals - Fixed Time Coordinated Cycle Time = 114 seconds (Network Cycle Time - User-Given)
Common Control Group: CCG1 [CCGName]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
2	T1	555	2.1	555	2.1	0.463	12.0	LOS A	14.4	102.9	0.51	0.46	27.7
3	R2	349	3.4	349	3.4	0.622	21.1	LOS B	9.5	68.2	0.90	0.83	26.9
Approach		904	2.6	904	2.6	0.622	15.5	LOS B	14.4	102.9	0.66	0.60	27.3
East: Lachlan Street													
4	L2	728	2.4	728	2.4	0.872	31.1	LOS C	26.6	189.5	0.71	0.85	20.3
6	R2	173	1.8	173	1.8	0.872	45.2	LOS D	26.6	189.5	0.97	0.92	19.8
Approach		900	2.3	900	2.3	0.872	33.8	LOS C	26.6	189.5	0.76	0.87	20.2
North: Bourke Street													
7	L2	48	0.0	48	0.0	0.895	63.6	LOS E	14.3	101.9	0.88	1.05	16.3
8	T1	500	2.1	500	2.1	0.895	53.9	LOS D	18.4	131.1	0.84	0.99	8.0
Approach		548	1.9	548	1.9	0.895	54.7	LOS D	18.4	131.1	0.85	0.99	9.0
All Vehicles		2353	2.3	2353	2.3	0.895	31.7	LOS C	26.6	189.5	0.74	0.79	18.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 24.7 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	80	28.2	LOS C	0.2	0.2	0.70	0.70
P3	North Full Crossing	19	38.0	LOS D	0.1	0.1	0.82	0.82
All Pedestrians		99	30.0	LOS D			0.73	0.73

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: 2 [2 Bourke / McEvoy Sat 2015]

Network: N101 [Sat 2015 - Lachlan / McEvoy / Young]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
McEvoy / Bourke
Sat 2015
Signals - Fixed Time Coordinated Cycle Time = 114 seconds (Network Cycle Time - User-Given)
Common Control Group: CCG1 [CCGName]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
1	L2	110	2.9	110	2.9	0.595	37.1	LOS C	11.6	82.9	0.87	0.78	14.8
2	T1	504	3.0	504	3.0	0.595	32.2	LOS C	16.5	118.3	0.87	0.76	15.3
Approach		614	3.0	614	3.0	0.595	33.1	LOS C	16.5	118.3	0.87	0.77	15.2
North: Bourke Street													
8	T1	701	4.0	701	4.0	0.507	7.0	LOS A	14.6	106.1	0.47	0.43	36.6
9	R2	458	3.7	458	3.7	0.611	14.6	LOS B	8.7	62.8	0.65	0.77	14.2
Approach		1159	3.9	1159	3.9	0.611	10.0	LOS A	14.6	106.1	0.54	0.56	29.0
West: McEvoy Street													
10	L2	377	1.1	377	1.1	0.597	18.9	LOS B	10.5	74.2	0.54	0.74	13.6
12	R2	261	0.9	261	0.9	1.008	106.2	LOS F	17.8	125.7	1.00	1.15	7.9
Approach		638	1.0	638	1.0	1.008	54.7	LOS D	17.8	125.7	0.73	0.91	9.2
All Vehicles		2411	2.9	2411	2.9	1.008	27.7	LOS B	17.8	125.7	0.67	0.71	16.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 24.7 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	61	48.5	LOS E	0.2	0.2	0.92	0.92
P4	West Full Crossing	39	30.3	LOS D	0.1	0.1	0.73	0.73
All Pedestrians		100	41.4	LOS E			0.85	0.85

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

Network: N101 [Sat 2015 - Lachlan / McEvoy / Young]

Site: [E McEvoy / Young AM 2015]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
McEvoy / Young
AM 2015
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Young Street													
1	L2	124	1.9	124	1.9	0.261	7.8	LOS A	1.0	7.1	0.17	0.91	19.5
2	T1	12	0.0	12	0.0	0.261	40.5	LOS C	1.0	7.1	0.17	0.91	37.9
3	R2	6	0.0	6	0.0	0.261	43.8	LOS D	1.0	7.1	0.17	0.91	28.0
Approach		142	1.6	142	1.6	0.261	12.1	LOS A	1.0	7.1	0.17	0.91	21.2
East: McEvoy Street													
4	L2	34	0.0	34	0.0	0.047	5.0	LOS A	0.0	0.0	0.00	0.23	49.3
5	T1	484	4.4	484	4.4	0.233	0.1	LOS A	0.1	0.6	0.02	0.03	57.5
6	R2	4	0.0	4	0.0	0.233	10.7	LOS A	0.1	0.6	0.02	0.01	49.6
Approach		522	4.1	522	4.1	0.233	0.5	NA	0.1	0.6	0.02	0.04	56.4
North: Young Street													
7	L2	72	4.5	72	4.5	0.206	10.0	LOS A	0.7	5.2	0.60	0.94	32.3
8	T1	8	16.7	8	16.7	0.206	42.5	LOS C	0.7	5.2	0.60	0.94	36.2
9	R2	4	0.0	4	0.0	0.206	51.0	LOS D	0.7	5.2	0.60	0.94	31.5
Approach		84	5.5	84	5.5	0.206	15.1	LOS B	0.7	5.2	0.60	0.94	32.7
West: McEvoy Street													
10	L2	133	1.7	133	1.7	0.268	4.9	LOS A	0.0	0.0	0.00	0.16	53.2
11	T1	571	6.7	571	6.7	0.268	0.4	LOS A	0.6	4.5	0.09	0.14	45.3
12	R2	44	5.0	44	5.0	0.268	7.8	LOS A	0.6	4.5	0.25	0.12	44.7
Approach		749	5.7	749	5.7	0.268	1.6	NA	0.6	4.5	0.08	0.14	48.7
All Vehicles		1497	4.7	1497	4.7	0.268	3.0	NA	1.0	7.1	0.10	0.23	40.4

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 24.7 %

Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Network: N101 [Sat 2015 - Young / Danks / Potter]

Site: [D Young / Danks Sat 2015]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Young / Danks
Sat 2015
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Young Street													
1	L2	14	0.0	14	0.0	0.108	5.0	LOS A	0.5	3.6	0.27	0.25	36.6
2	T1	87	1.2	87	1.2	0.108	0.8	LOS A	0.5	3.6	0.27	0.25	46.6
3	R2	18	0.0	18	0.0	0.108	5.7	LOS A	0.5	3.6	0.27	0.25	45.7
Approach		119	0.9	119	0.9	0.108	2.0	NA	0.5	3.6	0.27	0.25	45.1
East: Danks Street													
4	L2	44	2.4	44	2.4	0.397	9.2	LOS A	1.8	13.0	0.42	1.01	40.4
5	T1	99	1.1	99	1.1	0.397	9.9	LOS A	1.8	13.0	0.42	1.01	35.0
6	R2	158	2.0	158	2.0	0.397	11.2	LOS A	1.8	13.0	0.42	1.01	35.2
Approach		301	1.7	301	1.7	0.397	10.4	LOS A	1.8	13.0	0.42	1.01	36.2
North: Young Street													
7	L2	111	1.0	111	1.0	0.171	5.2	LOS A	1.0	7.0	0.26	0.30	34.0
8	T1	102	1.0	102	1.0	0.171	0.8	LOS A	1.0	7.0	0.26	0.30	44.8
9	R2	24	0.0	24	0.0	0.171	4.9	LOS A	1.0	7.0	0.26	0.30	36.0
Approach		237	0.9	237	0.9	0.171	3.3	NA	1.0	7.0	0.26	0.30	41.5
West: Danks Street													
10	L2	44	0.0	44	0.0	0.131	7.8	LOS A	0.5	3.5	0.27	0.95	29.6
11	T1	57	3.7	57	3.7	0.131	9.5	LOS A	0.5	3.5	0.27	0.95	21.5
12	R2	16	0.0	16	0.0	0.131	10.5	LOS A	0.5	3.5	0.27	0.95	37.7
Approach		117	1.8	117	1.8	0.131	9.0	LOS A	0.5	3.5	0.27	0.95	29.0
All Vehicles		774	1.4	774	1.4	0.397	6.7	NA	1.8	13.0	0.32	0.67	38.1

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.3 %

Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Network: N101 [AM Proposed - Young / Danks / Potter - opt]

Site: 4 [4 Bourke / Potter AM Proposed - opt]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Potter
AM Proposed
Signals - Fixed Time Coordinated Cycle Time = 90 seconds (Network Cycle Time - User-Given)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
1	L2	42	0.0	42	0.0	0.353	10.3	LOS A	6.7	49.8	0.37	0.36	36.1
2	T1	673	8.1	673	8.1	0.353	6.4	LOS A	6.7	49.8	0.39	0.39	29.7
3	R2	86	1.3	86	1.3	0.353	12.0	LOS A	5.9	43.7	0.41	0.42	32.1
Approach		801	6.9	801	6.9	0.353	7.2	LOS A	6.7	49.8	0.39	0.39	30.7
East: Potter Street													
4	L2	58	7.0	58	7.0	0.063	14.7	LOS B	1.2	9.2	0.52	0.62	25.4
5	T1	34	0.0	34	0.0	0.339	37.8	LOS C	3.6	25.0	0.93	0.75	16.6
6	R2	54	0.0	54	0.0	0.339	41.2	LOS C	3.6	25.0	0.93	0.75	9.1
Approach		146	2.8	146	2.8	0.339	29.9	LOS C	3.6	25.0	0.77	0.70	16.3
North: Bourke Street													
7	L2	52	4.8	52	4.8	0.133	27.0	LOS B	2.1	15.0	0.63	0.63	20.0
8	T1	358	5.4	358	5.4	0.618	26.4	LOS B	12.1	88.6	0.81	0.71	20.8
9	R2	21	0.0	21	0.0	0.618	31.3	LOS C	12.1	88.6	0.82	0.72	21.9
Approach		431	5.1	431	5.1	0.618	26.7	LOS B	12.1	88.6	0.79	0.70	20.8
West: Main Street													
10	L2	59	0.0	59	0.0	0.212	41.0	LOS C	2.3	16.4	0.92	0.73	12.2
11	T1	11	0.0	11	0.0	0.069	36.6	LOS C	0.7	4.9	0.89	0.65	17.1
12	R2	7	0.0	7	0.0	0.069	40.0	LOS C	0.7	4.9	0.89	0.65	17.9
Approach		77	0.0	77	0.0	0.212	40.3	LOS C	2.3	16.4	0.91	0.72	13.6
All Vehicles		1455	5.6	1455	5.6	0.618	17.0	LOS B	12.1	88.6	0.57	0.53	22.7

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.1 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	272	39.6	LOS D	0.7	0.7	0.94	0.94
P2	East Full Crossing	61	26.5	LOS C	0.1	0.1	0.77	0.77
P3	North Full Crossing	63	39.3	LOS D	0.2	0.2	0.94	0.94
P4	West Full Crossing	105	25.8	LOS C	0.2	0.2	0.76	0.76
All Pedestrians		501	35.1	LOS D			0.88	0.88

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

Network: N101 [PM Proposed - Young / Danks / Potter - opt]

Site: 4 [4 Bourke / Potter PM Proposed - opt]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Potter
PM Proposed
Signals - Fixed Time Coordinated Cycle Time = 106 seconds (Network Cycle Time - User-Given)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
1	L2	46	0.0	46	0.0	0.127	8.0	LOS A	2.4	17.1	0.28	0.33	37.9
2	T1	754	2.1	754	2.1	0.549	5.8	LOS A	15.5	110.4	0.44	0.42	31.0
3	R2	77	0.0	77	0.0	0.549	10.9	LOS A	15.5	110.4	0.47	0.44	34.3
Approach		877	1.8	877	1.8	0.549	6.3	LOS A	15.5	110.4	0.43	0.42	32.0
East: Potter Street													
4	L2	108	3.9	108	3.9	0.106	14.6	LOS B	2.5	18.4	0.49	0.63	25.5
5	T1	36	0.0	36	0.0	0.605	53.0	LOS D	5.0	34.8	1.00	0.81	13.6
6	R2	58	0.0	58	0.0	0.605	56.4	LOS D	5.0	34.8	1.00	0.81	7.0
Approach		202	2.1	202	2.1	0.605	33.4	LOS C	5.0	34.8	0.73	0.71	15.7
North: Bourke Street													
7	L2	55	0.0	55	0.0	0.498	26.1	LOS B	9.8	70.9	0.68	0.61	21.3
8	T1	455	4.1	455	4.1	0.498	23.8	LOS B	9.8	70.9	0.71	0.63	21.9
9	R2	23	0.0	23	0.0	0.498	30.9	LOS C	8.6	62.2	0.75	0.64	21.9
Approach		533	3.5	533	3.5	0.498	24.3	LOS B	9.8	70.9	0.71	0.63	21.9
West: Main Street													
10	L2	51	0.0	51	0.0	0.278	53.4	LOS D	2.5	17.7	0.97	0.74	10.1
11	T1	11	0.0	11	0.0	0.158	49.7	LOS D	1.2	8.1	0.95	0.70	14.2
12	R2	13	0.0	13	0.0	0.158	53.2	LOS D	1.2	8.1	0.95	0.70	14.9
Approach		74	0.0	74	0.0	0.278	52.8	LOS D	2.5	17.7	0.96	0.73	11.6
All Vehicles		1686	2.3	1686	2.3	0.605	17.3	LOS B	15.5	110.4	0.58	0.53	22.6

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.1 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	47.3	LOS E	0.1	0.1	0.95	0.95
P2	East Full Crossing	46	31.8	LOS D	0.1	0.1	0.78	0.78
P3	North Full Crossing	17	47.2	LOS E	0.0	0.0	0.94	0.94
P4	West Full Crossing	105	31.1	LOS D	0.2	0.2	0.77	0.77
All Pedestrians		221	36.3	LOS D			0.82	0.82

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: 4 [4 Bourke / Potter PM Proposed - opt]

Network: N101 [PM Proposed - Young / Danks / Potter - opt]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Potter
PM Proposed
Signals - Fixed Time Coordinated Cycle Time = 106 seconds (Network Cycle Time - User-Given)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
1	L2	36	0.0	36	0.0	0.125	8.0	LOS A	2.4	16.9	0.28	0.31	38.3
2	T1	754	2.1	754	2.1	0.538	5.7	LOS A	15.1	107.3	0.43	0.41	31.3
3	R2	77	0.0	77	0.0	0.538	10.8	LOS A	15.1	107.3	0.47	0.44	34.4
Approach		866	1.8	866	1.8	0.538	6.2	LOS A	15.1	107.3	0.43	0.41	32.2
East: Potter Street													
4	L2	108	3.9	108	3.9	0.104	14.1	LOS A	2.5	17.9	0.48	0.63	25.9
5	T1	36	0.0	36	0.0	0.605	53.0	LOS D	5.0	34.8	1.00	0.81	13.6
6	R2	58	0.0	58	0.0	0.605	56.4	LOS D	5.0	34.8	1.00	0.81	7.0
Approach		202	2.1	202	2.1	0.605	33.1	LOS C	5.0	34.8	0.72	0.71	15.7
North: Bourke Street													
7	L2	55	0.0	55	0.0	0.509	27.1	LOS B	10.1	72.6	0.70	0.63	20.8
8	T1	455	4.1	455	4.1	0.509	24.4	LOS B	10.1	72.6	0.72	0.64	21.6
9	R2	23	0.0	23	0.0	0.509	31.1	LOS C	8.8	63.3	0.75	0.65	21.9
Approach		533	3.5	533	3.5	0.509	25.0	LOS B	10.1	72.6	0.72	0.64	21.5
West: Main Street													
10	L2	51	0.0	51	0.0	0.278	53.4	LOS D	2.5	17.7	0.97	0.74	10.1
11	T1	11	0.0	11	0.0	0.158	49.7	LOS D	1.2	8.1	0.95	0.70	14.2
12	R2	13	0.0	13	0.0	0.158	53.2	LOS D	1.2	8.1	0.95	0.70	14.9
Approach		74	0.0	74	0.0	0.278	52.8	LOS D	2.5	17.7	0.96	0.73	11.6
All Vehicles		1675	2.3	1675	2.3	0.605	17.5	LOS B	15.1	107.3	0.58	0.53	22.5

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.1 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	53	47.3	LOS E	0.1	0.1	0.95	0.95
P2	East Full Crossing	46	32.6	LOS D	0.1	0.1	0.78	0.78
P3	North Full Crossing	17	47.2	LOS E	0.0	0.0	0.94	0.94
P4	West Full Crossing	105	31.9	LOS D	0.2	0.2	0.78	0.78
All Pedestrians		221	36.8	LOS D			0.83	0.83

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: 4 [4 Bourke / Potter Sat Proposed - opt]

Network: N101 [Sat Proposed - Young / Danks / Potter - opt]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Potter
Sat Proposed
Signals - Fixed Time Coordinated Cycle Time = 114 seconds (Network Cycle Time - User-Given)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
1	L2	63	0.0	63	0.0	0.130	9.4	LOS A	2.9	20.7	0.32	0.40	35.8
2	T1	656	1.6	656	1.6	0.563	7.9	LOS A	15.9	112.8	0.49	0.48	27.3
3	R2	75	0.0	75	0.0	0.563	13.1	LOS A	15.9	112.8	0.53	0.49	31.6
Approach		794	1.3	794	1.3	0.563	8.5	LOS A	15.9	112.8	0.48	0.47	28.9
East: Potter Street													
4	L2	84	0.0	84	0.0	0.115	26.6	LOS B	2.9	20.5	0.67	0.68	19.4
5	T1	32	0.0	32	0.0	0.617	54.6	LOS D	6.3	44.4	1.00	0.82	13.3
6	R2	82	0.0	82	0.0	0.617	58.0	LOS E	6.3	44.4	1.00	0.82	6.8
Approach		198	0.0	198	0.0	0.617	44.1	LOS D	6.3	44.4	0.86	0.76	12.4
North: Bourke Street													
7	L2	93	0.0	93	0.0	0.118	23.0	LOS B	2.7	18.7	0.52	0.66	21.2
8	T1	459	1.1	459	1.1	0.548	20.9	LOS B	16.1	113.7	0.66	0.60	23.8
9	R2	21	0.0	21	0.0	0.548	25.4	LOS B	16.1	113.7	0.66	0.59	24.6
Approach		573	0.9	573	0.9	0.548	21.4	LOS B	16.1	113.7	0.64	0.61	23.4
West: Main Street													
10	L2	13	0.0	13	0.0	0.110	52.1	LOS D	1.3	9.0	0.92	0.68	10.6
11	T1	53	0.0	53	0.0	0.507	51.5	LOS D	5.4	37.5	0.97	0.76	13.9
12	R2	59	0.0	59	0.0	0.507	55.9	LOS D	5.4	37.5	0.98	0.78	14.4
Approach		124	0.0	124	0.0	0.507	53.7	LOS D	5.4	37.5	0.97	0.76	13.8
All Vehicles		1688	0.9	1688	0.9	0.617	20.4	LOS B	16.1	113.7	0.62	0.57	21.2

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.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.4 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	105	51.4	LOS E	0.3	0.3	0.95	0.95
P2	East Full Crossing	105	19.8	LOS B	0.2	0.2	0.59	0.59
P3	North Full Crossing	105	51.4	LOS E	0.3	0.3	0.95	0.95
P4	West Full Crossing	105	19.2	LOS B	0.2	0.2	0.58	0.58
All Pedestrians		421	35.4	LOS D			0.77	0.77

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: 5 [5 Bourke / Danks Sat Proposed]

Network: N101 [Sat Proposed - Young / Danks / Potter - opt]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Danks
Sat Proposed
Signals - Fixed Time Coordinated Cycle Time = 114 seconds (Network Cycle Time - User-Given)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
1	L2	147	3.9	147	3.9	0.373	11.0	LOS A	6.0	42.9	0.32	0.43	27.3
2	T1	538	2.4	538	2.4	0.373	6.4	LOS A	6.0	42.9	0.32	0.36	34.3
3	R2	34	0.0	34	0.0	0.373	11.0	LOS A	5.9	41.8	0.33	0.32	35.0
Approach		719	2.6	719	2.6	0.373	7.5	LOS A	6.0	42.9	0.32	0.38	33.2
East: Danks Street													
4	L2	46	0.0	46	0.0	0.687	51.2	LOS D	11.2	79.0	0.97	0.84	10.9
5	T1	165	1.3	165	1.3	0.687	47.8	LOS D	11.2	79.0	0.97	0.84	10.9
6	R2	166	0.6	166	0.6	0.849	65.7	LOS E	10.3	72.3	1.00	0.99	11.4
Approach		377	0.9	377	0.9	0.849	56.1	LOS D	11.2	79.0	0.99	0.91	11.2
North: Bourke Street													
7	L2	88	2.9	88	2.9	0.078	11.6	LOS A	1.8	12.8	0.37	0.61	29.6
8	T1	426	2.3	426	2.3	0.390	7.4	LOS A	10.3	73.4	0.44	0.42	24.5
9	R2	38	0.0	38	0.0	0.390	11.9	LOS A	10.3	73.4	0.44	0.42	24.6
Approach		552	2.3	552	2.3	0.390	8.4	LOS A	10.3	73.4	0.43	0.45	26.1
West: Danks Street													
10	L2	68	2.0	68	2.0	0.302	55.0	LOS D	3.5	25.2	0.95	0.76	16.0
11	T1	84	2.8	84	2.8	0.712	55.7	LOS D	7.3	52.7	1.00	0.87	17.8
12	R2	46	4.5	46	4.5	0.712	59.1	LOS E	7.3	52.7	1.00	0.87	13.0
Approach		198	2.9	198	2.9	0.712	56.3	LOS D	7.3	52.7	0.98	0.83	16.2
All Vehicles		1846	2.2	1846	2.2	0.849	22.9	LOS B	11.2	79.0	0.56	0.56	19.4

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.4 %
Number of Iterations: 5 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	89	45.8	LOS E	0.3	0.3	0.90	0.90
P2	East Full Crossing	95	8.5	LOS A	0.1	0.1	0.39	0.39
P3	North Full Crossing	298	46.2	LOS E	0.9	0.9	0.91	0.91
P4	West Full Crossing	84	8.5	LOS A	0.1	0.1	0.39	0.39
All Pedestrians		566	34.2	LOS D			0.74	0.74

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: 3 [3 Bourke / Lachlan Sat Proposed]

Network: N101 [Sat Proposed - Lachlan / McEvoy / Young]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Bourke / Lachlan
Sat Proposed
Signals - Fixed Time Coordinated Cycle Time = 114 seconds (Network Cycle Time - User-Given)
Common Control Group: CCG1 [CCGName]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
2	T1	565	2.0	565	2.0	0.459	11.0	LOS A	14.5	103.5	0.51	0.46	28.8
3	R2	352	3.4	352	3.4	0.612	20.3	LOS B	9.2	66.3	0.90	0.83	27.4
Approach		917	2.6	917	2.6	0.612	14.6	LOS B	14.5	103.5	0.66	0.60	28.1
East: Lachlan Street													
4	L2	728	2.4	728	2.4	0.942	45.7	LOS D	31.1	221.9	0.85	0.96	15.5
6	R2	194	1.6	194	1.6	0.942	61.1	LOS E	31.1	221.9	1.00	1.00	16.2
Approach		922	2.2	922	2.2	0.942	49.0	LOS D	31.1	221.9	0.88	0.97	15.7
North: Bourke Street													
7	L2	62	0.0	62	0.0	0.921	70.7	LOS F	15.6	110.7	0.88	1.10	15.0
8	T1	516	2.0	516	2.0	0.921	60.3	LOS E	21.0	149.7	0.84	1.04	7.3
Approach		578	1.8	578	1.8	0.921	61.4	LOS E	21.0	149.7	0.85	1.05	8.3
All Vehicles		2417	2.3	2417	2.3	0.942	38.9	LOS C	31.1	221.9	0.79	0.85	16.1

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 139.5 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	80	27.5	LOS C	0.2	0.2	0.70	0.70
P3	North Full Crossing	19	39.6	LOS D	0.1	0.1	0.83	0.83
All Pedestrians		99	29.8	LOS C			0.72	0.72

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: 2 [2 Bourke / McEvoy Sat Proposed]

Network: N101 [Sat Proposed - Lachlan / McEvoy / Young]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
McEvoy / Bourke
Sat Proposed
Signals - Fixed Time Coordinated Cycle Time = 114 seconds (Network Cycle Time - User-Given)
Common Control Group: CCG1 [CCGName]

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Bourke Street													
1	L2	110	2.9	110	2.9	0.574	36.1	LOS C	11.3	81.3	0.85	0.77	15.1
2	T1	515	2.9	515	2.9	0.574	31.1	LOS C	16.7	119.5	0.86	0.75	15.7
Approach		625	2.9	625	2.9	0.574	32.0	LOS C	16.7	119.5	0.86	0.76	15.6
North: Bourke Street													
8	T1	706	4.0	706	4.0	0.498	6.2	LOS A	14.7	106.1	0.44	0.40	37.8
9	R2	468	3.6	468	3.6	0.605	13.8	LOS A	8.8	63.3	0.62	0.76	14.8
Approach		1174	3.8	1174	3.8	0.605	9.2	LOS A	14.7	106.1	0.51	0.54	30.0
West: McEvoy Street													
10	L2	380	1.1	380	1.1	0.598	19.6	LOS B	10.9	77.0	0.55	0.75	13.2
12	R2	270	0.8	270	0.8	1.191	239.8	LOS F	17.8	125.7	1.00	1.50	3.7
Approach		650	1.0	650	1.0	1.191	111.1	LOS F	17.8	125.7	0.74	1.06	4.8
All Vehicles		2449	2.9	2449	2.9	1.191	42.1	LOS C	17.8	125.7	0.66	0.74	12.0

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.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 139.5 %
Number of Iterations: 10 (maximum specified: 10)

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Average Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	61	50.3	LOS E	0.2	0.2	0.94	0.94
P4	West Full Crossing	39	29.5	LOS C	0.1	0.1	0.72	0.72
All Pedestrians		100	42.2	LOS E			0.86	0.86

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: [E McEvoy / Young Sat Proposed]

Network: N101 [Sat Proposed - Lachlan / McEvoy / Young]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
McEvoy / Young
Sat Proposed
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Young Street													
1	L2	70	0.0	70	0.0	0.427	13.2	LOS A	1.8	12.7	0.29	0.94	15.7
2	T1	16	0.0	16	0.0	0.427	40.7	LOS C	1.8	12.7	0.29	0.94	30.4
3	R2	20	0.0	20	0.0	0.427	52.0	LOS D	1.8	12.7	0.29	0.94	19.0
Approach		106	0.0	106	0.0	0.427	24.7	LOS B	1.8	12.7	0.29	0.94	18.5
East: MceVoy Street													
4	L2	36	0.0	36	0.0	0.054	5.0	LOS A	0.0	0.0	0.00	0.21	49.6
5	T1	547	2.4	547	2.4	0.269	0.2	LOS A	0.2	1.7	0.05	0.04	56.1
6	R2	14	0.0	14	0.0	0.269	9.3	LOS A	0.2	1.7	0.05	0.02	49.2
Approach		597	2.2	597	2.2	0.269	0.7	NA	0.2	1.7	0.04	0.05	55.0
North: Young Street													
7	L2	108	0.0	108	0.0	0.327	10.0	LOS A	1.4	10.0	0.57	0.95	31.1
8	T1	20	6.3	20	6.3	0.327	38.3	LOS C	1.4	10.0	0.57	0.95	35.4
9	R2	8	0.0	8	0.0	0.327	47.0	LOS D	1.4	10.0	0.57	0.95	30.5
Approach		136	0.9	136	0.9	0.327	16.4	LOS B	1.4	10.0	0.57	0.95	31.8
West: McEvoy Street													
10	L2	94	1.3	94	1.3	0.182	4.9	LOS A	0.0	0.0	0.00	0.16	53.4
11	T1	506	0.2	506	0.2	0.182	0.5	LOS A	10.9	76.5	0.12	0.13	45.2
12	R2	44	0.0	44	0.0	0.182	8.2	LOS A	10.9	76.5	0.24	0.10	45.2
Approach		644	0.3	644	0.3	0.182	1.7	NA	10.9	76.5	0.11	0.13	48.2
All Vehicles		1483	1.1	1483	1.1	0.427	4.3	NA	10.9	76.5	0.14	0.23	39.2

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 139.5 %

Number of Iterations: 10 (maximum specified: 10)

MOVEMENT SUMMARY

Network: N101 [Sat Proposed - Young / Danks / Potter - opt]

Site: [D Young / Danks Sat Proposed]

17S580 - Danks St Sth Waterloo Urban Design Study CoS
Young / Danks
Sat Proposed
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	Demand Flows HV %	Arrival Flows Total veh/h	Arrival Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Young Street													
1	L2	19	0.0	19	0.0	0.125	5.0	LOS A	0.6	4.2	0.27	0.25	36.6
2	T1	101	1.0	101	1.0	0.125	0.8	LOS A	0.6	4.2	0.27	0.25	46.5
3	R2	18	0.0	18	0.0	0.125	5.8	LOS A	0.6	4.2	0.27	0.25	45.7
Approach		138	0.8	138	0.8	0.125	2.0	NA	0.6	4.2	0.27	0.25	44.8
East: Danks Street													
4	L2	44	2.4	44	2.4	0.409	9.3	LOS A	1.9	13.7	0.44	1.03	40.2
5	T1	99	1.1	99	1.1	0.409	10.2	LOS A	1.9	13.7	0.44	1.03	34.7
6	R2	158	2.0	158	2.0	0.409	11.6	LOS A	1.9	13.7	0.44	1.03	34.9
Approach		301	1.7	301	1.7	0.409	10.8	LOS A	1.9	13.7	0.44	1.03	35.9
North: Young Street													
7	L2	111	1.0	111	1.0	0.182	5.2	LOS A	1.1	7.6	0.27	0.29	34.2
8	T1	113	0.9	113	0.9	0.182	0.8	LOS A	1.1	7.6	0.27	0.29	44.9
9	R2	24	0.0	24	0.0	0.182	5.0	LOS A	1.1	7.6	0.27	0.29	36.2
Approach		247	0.9	247	0.9	0.182	3.2	NA	1.1	7.6	0.27	0.29	41.8
West: Danks Street													
10	L2	44	0.0	44	0.0	0.144	7.8	LOS A	0.5	3.9	0.30	0.95	29.4
11	T1	57	3.7	57	3.7	0.144	9.7	LOS A	0.5	3.9	0.30	0.95	21.3
12	R2	21	0.0	21	0.0	0.144	10.8	LOS A	0.5	3.9	0.30	0.95	37.6
Approach		122	1.7	122	1.7	0.144	9.2	LOS A	0.5	3.9	0.30	0.95	29.4
All Vehicles		808	1.3	808	1.3	0.409	6.7	NA	1.9	13.7	0.34	0.66	38.2

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.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

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

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

Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.4 %

Number of Iterations: 5 (maximum specified: 10)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