



Royal Prince Alfred Hospital Lucas Street Staff Multi-Storey Car Park Revised Transport Impact Assessment

Client // Health Infrastructure
Office // NSW
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Quality Record

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Table of Contents

1. Introduction	1
1.1 Background	1
1.2 Project Context	1
1.3 Purpose of this Report	2
1.4 Stakeholder Consultation	3
1.5 References	4
2. Existing Conditions	5
2.1 Subject Site	5
2.2 Road Network	6
2.3 Surrounding Intersections	11
2.4 On-site Observations	11
2.5 Traffic Volumes	12
2.6 Intersection Operation	14
2.7 Existing Staff Movements	15
2.8 Car Parking	16
2.9 Public Transport	17
2.10 Pedestrian Infrastructure	18
2.11 Cycle Infrastructure	18
2.12 Local Car Sharing Initiatives	20
2.13 Other Initiatives	21
2.14 Existing Transport Use	21
3. Development Proposal	23
3.1 Overview	23
4. Car Parking	25
4.1 Car Parking Assessment	25
4.2 Car Parking Layout Review	25
5. Sustainable Transport Infrastructure	27
5.1 Walking and Cycling Network	27
5.2 Public Transport	27
5.3 Sustainable Transport Measures	27
6. Traffic Impact Assessment	29
6.1 Traffic Generation	29
6.2 Distribution and Assignment	31
6.3 Traffic Impact	34

7. Construction Traffic Impact	37
7.1 Overall Principles of Construction Traffic Management	37
7.2 General Requirements	37
7.3 Work Hours	37
7.4 Construction Worker Parking	38
7.5 Construction Traffic Volumes	38
7.6 Site Access	38
7.7 Construction Vehicle Routes	38
7.8 On-street Works Zones	39
7.9 Special Deliveries	39
7.10 Traffic Control Plans	39
7.11 Pedestrian Management	40
7.12 Public Transport	40
7.13 Emergency Vehicles and Heavy Vehicles	40
7.14 Existing and Future Developments	40
7.15 Traffic Movements in Adjoining Areas	40
8. Contractor Requirements	41
8.1 Construction Traffic Management Plan	41
8.2 Staff Induction	41
8.3 Contact Details of the Site Manager(s)	41
8.4 Occupational Health and Safety	41
8.5 Communications	41
9. Conclusion	42

Appendices

- A: Survey Results
- B: SIDRA INTERSECTION Results
- C: Compliance Review and Swept Path Assessment

Figures

Figure 2.1:	Subject Site and Its Environs	5
Figure 2.2:	Site Location and Surrounding Context	6
Figure 2.3:	Site and Surrounding Active Travel Catchments	6
Figure 2.4:	Lucas Street (looking west)	7
Figure 2.5:	Lucas Street (looking east)	7
Figure 2.6:	Church Street (looking south)	8

Figure 2.7:	Church Street (looking south to the site)	8
Figure 2.8:	Brodie Street (looking east)	9
Figure 2.9:	Brodie Street (looking west)	9
Figure 2.10:	Grose Street and New Road (looking south)	9
Figure 2.11:	Grose Street (looking west)	9
Figure 2.12:	Carillon Avenue (looking east from Grose Street)	10
Figure 2.13:	Missenden Road at Carillon Avenue (looking north)	10
Figure 2.14:	Existing AM/ PM Peak Hour Traffic Volumes	13
Figure 2.15:	RPAH Staff Shift Times	16
Figure 2.16:	412 Bus Route and Stop Locations	17
Figure 2.17:	Existing Bus Services	18
Figure 2.18:	Bicycle Routes Surrounding the Site	19
Figure 2.19:	Bicycle Parking Facilities	20
Figure 2.20:	GoGet Car Share Pod Locations	20
Figure 2.21:	Travel Zones 236 and 238	21
Figure 3.1:	Ground Level Plan	24
Figure 3.2:	Anticipated Staff Arrival and Departure Routes	24
Figure 6.1:	Estimated MSCP Traffic Distributions	32
Figure 6.2:	Peak Hour Site Generated Traffic Volumes	33
Figure 6.3:	Existing Intersection Layout	35
Figure 6.4:	Potential Future Intersection Layout	36
Figure 7.1:	Construction Vehicle Approach and Departure Routes	39

Tables

Table 1.1:	Secretary's Environmental Assessment Requirements (SEARs)	3
Table 2.1:	SIDRA INTERSECTION Level of Service Criteria	14
Table 2.2:	Existing Operating Conditions	15
Table 2.3:	2006 and 2011 Census Journey to Work Data (TZ 236 & 238)	22
Table 3.1:	MSCP Staff Car Parking Breakdown	23
Table 3.2:	Proposed MSCP Access Arrangements	23
Table 6.1:	Estimated MSCP Traffic Generation	31
Table 6.2:	Future Development Traffic	34

1. Introduction

1.1 Background

A proposal is currently being considered to construct a Multi-Storey Staff Car Park (MSCP) on a site located on Lucas Street, in close proximity to the Royal Prince Alfred Hospital (RPAH), Camperdown. The staff only car park is to support future growth of the RPAH as well as alleviate existing issues associated with demand generated by hospital staff in existing facilities and on-street in the surrounding areas. Health Infrastructure, engaged GTA Consultants in February 2016 to complete a transport impact assessment for the proposed MSCP.

A State Significant Development (SSD) application was lodged with the Department of Planning and Environment (DPE) in June 2016.

Several submissions on a variety of matters have been received in response to the SSD application with traffic, transport and parking impacts of particular concern for many stakeholders, landowners and the local community. As such, the details included in the transport impact assessment have been revised to more precisely address and communicate specific matters including, though not necessarily limited to the following:

- parking demand estimates and the historical demand for a staff parking facility
- staff arrival and departure routes associated with the MSCP, both pedestrian and vehicular
- campus wide transport initiatives, irrespective of the proposed MSCP
- additional intersection analysis and detailed descriptions of existing operation
- recent installation of local area traffic management on the surrounding road network.

1.2 Project Context

NSW Health has assessed car parking supply and demand for the RPAH campus. This indicates that, based on a 60% staff drive travel mode choice, RPAH presents a demand profile of 1,700 to 1,800 car spaces.

Until late 2015, the RPAH campus provided 1,027 staff only parking spaces within the privately owned MSCP, with access via Grose Street. The balance of staff parked in nearby streets, with predominantly public parking to the rear of King George V building.

In late 2015, access arrangements to the Grose Street MSCP changed, at which time the private operator was obliged to only provide 600 dedicated staff car spaces. The balance of 427 spaces was the original number agreed between RPA and the private hospital for public demand created by the private hospital. In addition, rates charged on the 600 staff spaces were substantially increased in excess of the Ministry of Health's Hospital Car Parking Fee Policy 2013, to which staff are entitled.

Short term reassignment of at-grade car spaces within the RPA campus have created 300 additional spaces for use by staff. However, since late 2015, substantial additional demand has been placed on car parking in surrounding streets, and staff concerns have escalated due to unavailability of parking, and increased charges.

While at present there is no progress on construction of the private hospital, in order to meet the demands for staff and public parking in the area, Sydney Local Health District (SLHD) must assume that the car spaces in the Grose Street MSCP will be utilised by the private hospital in the future and that any short term under-utilisation will be taken up by public parking and staff prepared to make public level payments (in excess of Ministry fees policy).

In the long term, SLHD must provide a reliable supply of staff parking in order to retain staff, guarantee their attendance for shifts, and at a rate consistent with the Ministry fees policy.

This proposal intends to address the demand generated for staff car parking by the hospital and consistent with the levels previously provided prior to the change in arrangements relating to the Grose Street MSCP.

1.3 Purpose of this Report

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

- i existing traffic and parking conditions surrounding the site
- ii suitability of the proposed parking in terms of supply (quantum) and layout
- iii service vehicle requirements
- iv the traffic generating characteristics of the proposed development
- v suitability of the proposed access arrangements for the site
- vi the transport impact of the development proposal on the surrounding road network.

This study has also considered the Secretary's Environmental Assessment Requirements (SEARs) for the Environmental Assessment of the proposed MSCP. The SEARs were issued by DPE for the construction of a multi-storey staff car park at Church Street, Camperdown (SSD 7542) on 29 March 2016. Section 6 of 'Key Issues' in the SEARs addresses the transport and accessibility requirements, as detailed in Table 1.1, along with the location that each issue is addressed in this report.

Table 1.1: Secretary's Environmental Assessment Requirements (SEARs)

Project Phase	SEAR Description	Relevant Section of this Report
6. Transport and Accessibility	Include a transport and accessibility assessment which details, but is not limited to, the following:	
	Details of the current daily and peak hour vehicle, public transport, pedestrian and bicycle movements and existing traffic and transport facilities provided on the road network adjacent to the proposed development	Section 2
	Provision of current staff and visitor car parking on the subject site	Section 2
	Current daily and hourly movements and duration of stay at the existing car park including on a typical weekday and weekend	Section 2.4
	An assessment of the existing and future transport needs associated with the hospital, including a clear understanding of the travel task for all modes at different times of the day (peak, off peak) and week	Various
	An estimate of the total daily and peak hour vehicle trips generated by the proposal, including details of assumptions made to determine/justify the amount of spaces sought to service the hospital, including estimated trip generation, car modal split, duration of stay etc.	Section 6.1
	An assessment of the existing and future performance of key intersections providing access to the site and any upgrades (road/intersections) required as a result of the development	Section 2.4 and Section 0
	An assessment of safety and convenient access for pedestrians between the proposed car park and hospital services	Section 5.1
	The impact on public transport services and infrastructure (existing and planned) and walking cycling access and facilities	Section 5
	The proposed access arrangements and measures to mitigate any associated impacts on road safety, walking and cycling, public transport services and traffic flows	Section 6
	Include a pricing policy for use of the car park to align public transport and active transport targets with private vehicle targets, with consideration given to formulating a Green Travel Plan for the hospital addressing ways in which sustainable and active transport modes will be encouraged	Section 5
	Traffic, transport and road safety impacts during construction and how these impacts will be mitigated for any associated traffic, pedestrian, cyclists, parking (including the temporary loss of parking on the site) and public transport impacts. Detailed information should be provided on existing bus services and bus stops and measures to avoid impacts during the construction period. A draft Construction Traffic Management Plan should be included to demonstrate the proposed management and mitigation of the impacts. This Plan should also provide details of vehicle routes, number of construction vehicle movements, hours of operation, construction program, work zone location, access arrangements and traffic control measures for all construction activities.	Section 7 and Section 8

1.4 Stakeholder Consultation

Stakeholder consultation has included discussions with the City of Sydney in March 2016 in relation to the traffic related impacts on the surrounding areas. Specifics included Missenden Road impacts given existing constraints and traffic congestion. It is understood that minor works may be completed by the City of Sydney along Missenden Road to alleviate pedestrian risks at the marked pedestrian crossings.

The traffic related impacts on the regional road network, including along Parramatta Road and King Street/ City Road are unlikely to be significant given the proposal largely represents more a redistribution of traffic that is already travelling to/ from the area, rather than 'new' vehicle trips per se. The intersections in the immediate vicinity have however, been assessed adopting a conservatively high approach by assuming all site generated traffic are 'new' trips. This approach is recognised by both City of Sydney and Roads and Maritime (RMS) and has been a key component of this assessment.

Consultation with RMS was undertaken in May 2016, where it was agreed that the proposal did not necessarily present a direct impact on RMS assets. Agreement was similarly achieved with

respect to the extent of traffic surveys completed, noting that further assessment (if any) would only be necessary as part of the Public Exhibition process post-submission.

Further RMS consultation has been completed following the Public Exhibition process and it was agreed that further intersection analysis was required to address some concerns of potential impacts to the regional road network. The following intersections have been added to the modelling assessment already completed:

- Parramatta Road/ Bridge Road
- Parramatta Road/ Missenden Road
- King Street/ City Road/ Carillon Avenue
- Missenden Road/ Marsden Street
- Missenden Road/ King Street.

It was also agreed that that analysis of the intersection of King Street/ Church Street was not required on account of it being left-in only from Carillon Avenue and not a logical approach or departure route for site generated traffic.

1.5 References

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

- several inspections of the site, the RPAH campus and surrounding areas
- City of Sydney Development Control Plan (DCP) 2012 and Local Environmental Plan (LEP) 2012
- Australian Standard/ New Zealand Standard, Parking Facilities, Part 1: Off-Street Car Parking AS/NZS 2890.1:2004
- Australian Standard / New Zealand Standard, Parking Facilities, Part 6: Off-Street Parking for People with Disabilities AS/NZS 2890.6:2009
- Guide to Traffic Generating Developments, Roads and Maritime Services, 2002
- various traffic and car parking surveys as referenced in the context of this report
- plans for the proposed development prepared by Cardno, Drawing Number NA80812331-DA-0102 to NA80812331-DA-0106, Revision 4, dated 28 April 2016
- other documents and data as referenced in this report.

2. Existing Conditions

2.1 Subject Site

The subject site is located on the south-eastern corner of the intersection of Lucas Street and Church Street in Camperdown. The site of 5,000sq.m has frontages of approximately 144m to Lucas Street and 35m to Church Street, and is currently occupied by a childcare centre with small at-grade car park and other vacant buildings.

The surrounding properties predominantly include the RPAH Campus and associated medical facilities. The newly constructed Marie Bashir Centre is located immediately to the east, with St John's residential College located further east on the eastern side of Missenden Road. The University of Sydney campus is also located further east. The broader local and regional area predominantly comprises a mix of retail, commercial, educational and residential uses.

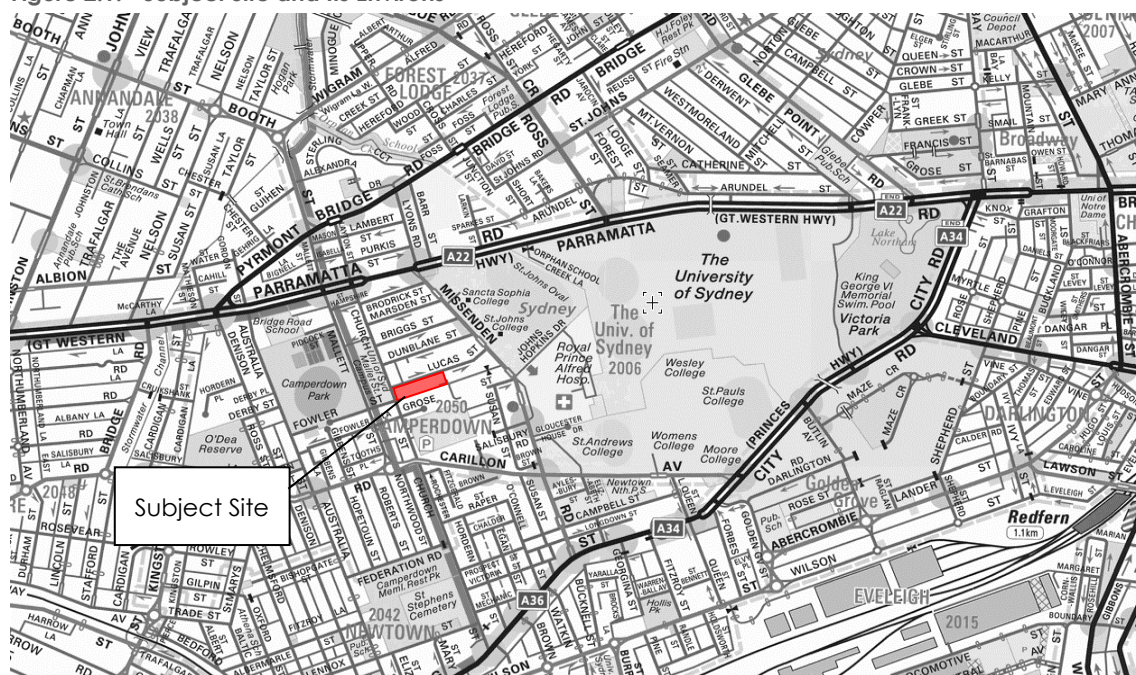
The Queen Mary Building is immediately to the south and has recently been refurbished to accommodate student housing for approximately 800 students and associated minor car parking. The main building access is located via the southern façade along Grose Street, with vehicles using Church Street to the west to access the small amount of on-site parking.

The Consulate-General of the People's Republic of China is located opposite the site on the northern side of Lucas Street.

Several car parking areas are available within the grounds of the RPAH Precinct with the main multi-storey staff and public car park located south of the site, with access provided along Hospital Road via Carillon Avenue and Grose Street.

The location of the subject site and its surrounding environs is shown in Figure 2.1 and Figure 2.2, with the local area catchments illustrated in Figure 2.3.

Figure 2.1: Subject Site and Its Environs



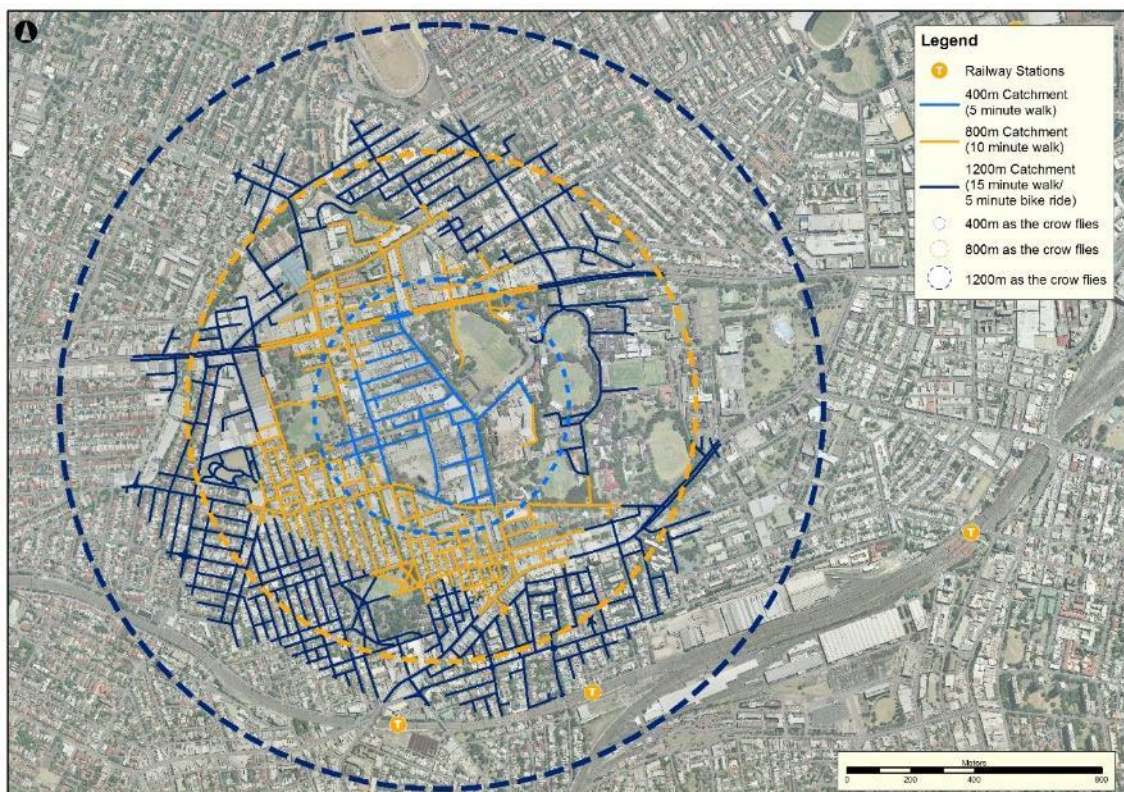
Basemap Source: Sydney

Figure 2.2: Site Location and Surrounding Context



Basemap Source: Nearmap

Figure 2.3: Site and Surrounding Active Travel Catchments



2.2 Road Network

The subject site is well served by a number of regional roads in the vicinity, with Parramatta Road and King Street/ City Road providing links to Missenden Road and Carillon Avenue to form the main traffic routes to/ from the RPAH Campus.

Parramatta Road is located to the north of the site and forms the major east-west traffic through the area linking Sydney's CBD in the east with Parramatta in the west. Carillon Avenue and Salisbury Road combine to provide a secondary east-west traffic route through the area and south of the site, effectively linking City Road with the suburbs of the Inner West.

2.2.1 Adjoining Roads

Lucas Street

Lucas Street is a local road and in the vicinity of the site is aligned in an east-west direction, travelling along the northern boundary of the site. It is a one-way eastbound road providing for one traffic lane and one parking lane within an approximate 6m wide carriageway.

Kerbside parking is permitted, subject to time restrictions on the southern side of Lucas Street along the site frontage, and on the northern side further to the east.

Lucas Street is shown in Figure 2.4 and Figure 2.5, and carries approximately 750-800 vehicles per day¹.

Figure 2.4: Lucas Street (looking west)



Figure 2.5: Lucas Street (looking east)



Church Street

Church Street is a local road and in the vicinity of the site is aligned in a north-south direction adjacent to the sites western boundary. It is a two-way road providing one traffic lane and one parking lane in each direction.

Kerbside parking is variable and generally permitted on both sides of the carriageway in the immediate vicinity of the site and limited to one side only to the north and south as a result of a variable carriageway width. Recent traffic calming measures implemented by City of Sydney have reduced the effective traffic lane widths, and with speed cushions and other measures, the intention has been to slow vehicle speed and improve pedestrian amenity.

Church Street is shown in Figure 2.6 and Figure 2.7.

¹ Based on the peak hour traffic counts undertaken by GTA in March 2016 and assuming a peak-to-daily ratio of 8% for arterial roads and 10% for local roads.

Figure 2.6: Church Street (looking south)



Figure 2.7: Church Street (looking south to the site)



Brodie Street

Brodie Street is a private local road internal to the RPAH Precinct travelling in an east-west direction immediately east of the site. It traverses the Marie Bashir Centre providing for one-way westbound traffic through a Shared Zone with direct boom gate controlled access from Missenden Road.

Brodie Street generally provides one traffic lane and parking lane (east of The Marie Bashir Centre) and a one lane Shared Zone with adjacent parking at the western end, close to Hospital Road.

Brodie Street is shown in Figure 2.8 and Figure 2.9.

Figure 2.8: Brodie Street (looking east)



Figure 2.9: Brodie Street (looking west)



Grose Street (Hospital Road)

Grose Street travels in a north-south direction south of the site and is the key road internal to the RPAH north-west Precinct west of Missenden Road. It generally provides one traffic lane in each direction and for northbound vehicles only between Brodie Street and Lucas Street. It currently provides access to the existing MSCP south of the Queen Mary building and turns to run east-west and link back to Church Street to the west.

Grose Street is shown in Figure 2.10 and Figure 2.11.

Figure 2.10: Grose Street and New Road (looking south)



Figure 2.11: Grose Street (looking west)



2.2.2 Surrounding Roads

Carillon Avenue

Carillon Avenue (and Salisbury Avenue) is a classified regional road and is aligned in an east-west direction south of the site. It is a two-way road generally configured with one traffic lane and one parking lane in each direction. Kerbside parking is generally permitted, subject to varying time restrictions along its length.

Carillon Avenue is shown in Figure 2.12.

Missenden Road

Missenden Road is a classified regional road and aligned in a north-south direction east of the site. It is a two-way road generally configured with one traffic lane and one parking lane in each direction, set within an approximate 25m wide road reserve. Kerbside parking is mostly permitted and subject to varying time restrictions along its length.

Missenden Road is shown in Figure 2.13.

Figure 2.12: Carillon Avenue (looking east from Grose Street)



Figure 2.13: Missenden Road at Carillon Avenue (looking north)



2.3 Surrounding Intersections

The following intersections are in close proximity to the site and within the Camperdown area more broadly. All intersections have been modelled as part of this assessment.

- Lucas Street/ Church Street (priority controlled)
- Lucas Street/ Missenden Road (priority controlled)
- Carillon Avenue/ Missenden Road (signalised)
- Carillon Avenue/ Grose Street (signalised)
- Carillon Avenue/ Church Street (priority controlled, left-in/ left-out)
- Church Street/ Fowler Lane (priority controlled)
- Church Street/ Fowler Street (priority controlled)
- Parramatta Road/ Bridge Road (signalised)
- Parramatta Road/ Mallett Street (signalised)
- Parramatta Road/ Church Street (signalised)
- Parramatta Road/ Missenden Road (signalised)
- Missenden Road/ Marsden Street
- Missenden Road/ King Street (signalised)
- City Road/ King Street/ Carillon Avenue (signalised).

2.4 On-site Observations

Key to understanding the traffic related impacts associated with the proposal is knowledge of the existing key intersections and function of the key roads throughout the area. Observations during the respective peak periods have been completed on several occasions, together with queuing assessments and general intersection operation. With this in mind, the following comments inform the assessment:

- westbound traffic volumes on Parramatta Road are moderate during the AM peak and allow for long gaps in the traffic flow
- traffic turning right from Parramatta Road at Bridge Road during the AM peak are relatively unconstrained with low to moderate queue lengths
- Bridge Road experiences some delay and queuing on approach to Parramatta Road during the AM and PM peaks
- Parramatta Road intersections are generally coordinated with upstream and downstream signals thereby allowing for a favourable arrival profiles to aid intersection operation and therefore managing queuing on Parramatta Road through the area generally
- Mallett Street traffic experiences some delay at Parramatta Road which is generally expected (and accepted) where minor roads intersect with major roads
- eastbound traffic on Carillon Avenue experiences queuing and delay at Missenden Road with queues observed to extent west of Grose Street during the AM peak
- These queues create additional gaps for Carillon Avenue traffic to turn right into Grose Street
- very little congestion or delay is evident at the local area intersections, noting the presence of some vehicles using Church Street and Lucas Street/ Briggs Street to access Missenden Road during the AM peak
- recent local area traffic calming along Church Street appears to have slowed vehicle speed
- King Street/ City Road experiences high traffic volumes in the respective peak hours with queuing common at key intersections, as is common for key regional roads carrying such traffic volumes in such locations

- the one-way local streets intersecting with Missenden Road south of Parramatta Road experience low-moderate traffic volumes with nominal queuing for all approaches.

2.5 Traffic Volumes

GTA Consultants commissioned traffic movement counts on key roads in the vicinity of the site (including all intersections as detailed above) on Tuesday 15 March 2016 during the weekday AM and PM peak periods. The additional intersection counts were completed on 18 August 2016.

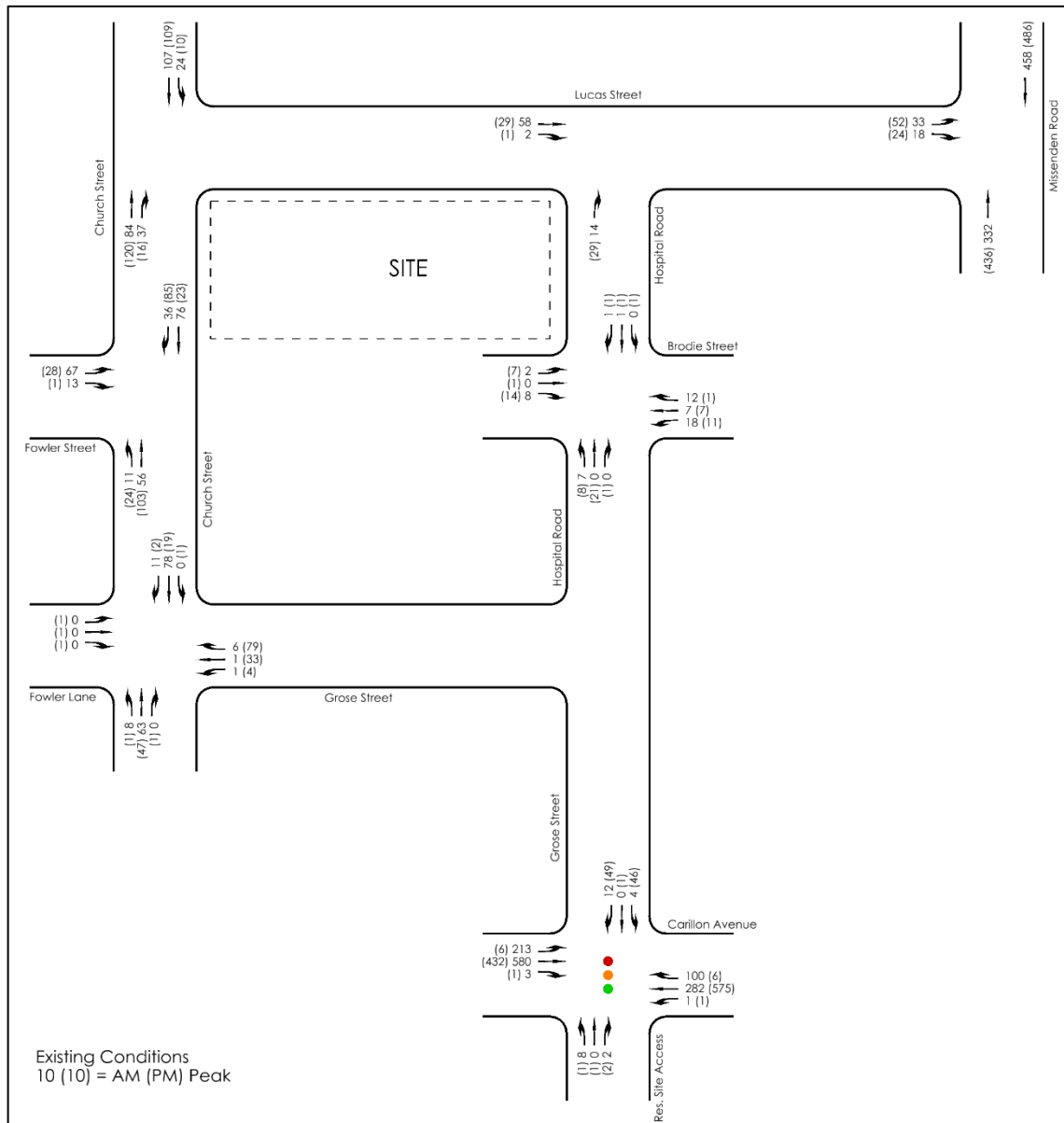
The survey data indicated that the road network peak hours were between 7:45am and 8:45am, and 4:30pm and 5:30pm.

With consideration for the above, it is noted that these peak hours do not specifically coincide with the peak RPAH staff activity periods, nor traffic associated with the proposed MSCP. This is particularly the case during the morning period when the majority of staff driving to work typically arrive for the start of the daytime shifts prior to 8:00am. Specific descriptions of these staff shift times and arrival peaks are detailed in Section 6 of this report.

With this in mind, this assessment has taken a conservatively high approach by adopting an AM peak between 7:00am and 8:00am, and a PM peak of between 4:30pm and 5:30pm.

The traffic volumes for the site peak hours are summarised in Figure 2.14, with full results included in Appendix A.

Figure 2.14: Existing AM/ PM Peak Hour Traffic Volumes



2.6 Intersection Operation

The operation of the key intersections within the study area have been assessed using SIDRA INTERSECTION², a computer based modelling package which calculates intersection performance.

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

Table 2.1 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

Table 2.1: SIDRA INTERSECTION Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

Table 2.2 presents a summary of the existing operation of the intersection, with full results presented in Appendix B of this report.

² Program used under license from Akcelik & Associates Pty Ltd.

Table 2.2: Existing Operating Conditions

Intersection	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Lucas Street/ Church Street	AM	0.07	2	2	NA
	PM	0.07	1	1	NA
Lucas Street/ Missenden Road	AM	0.25	1	1	NA
	PM	0.27	1	1	NA
Church Street/ Fowler Street	AM	0.06	3	2	NA
	PM	0.07	3	2	NA
Church Street/ Grose Street/ Fowler Lane	AM	0.06	1	2	NA
	PM	0.09	3	3	NA
Lucas Street/ New Road	AM	0.03	1	0	NA
	PM	0.02	3	1	NA
Brodie Street/ New Road	AM	0.03	5	1	NA
	PM	0.02	4	1	NA
Parramatta Road/ Mallett Street	AM	0.79	11	86	A
	PM	1.00	14	107	A
Parramatta Road/ Layton Road/ Church Street	AM	0.71	4	31	A
	PM	0.64	5	41	A
Salisbury Road/ Mallett Street	AM	0.79	8	92	A
	PM	0.75	9	73	A
Carillon Avenue/ Grose Street	AM	0.46	5	55	A
	PM	0.34	8	50	A
Carillon Avenue/ Missenden Road	AM	0.71	37	168	C
	PM	0.92	48	194	D
Parramatta Road/ Missenden Road/ Lyons Road	AM	0.80	16	149	B
	PM	0.93	31	394	C
Parramatta Road/ Bridge Road	AM	0.99	15	171	B
	PM	0.75	9	88	A
Carillon Avenue/ City Road	AM	0.90	36	336	C
	PM	0.68	24	172	B
Missenden Road/ Marsden Street	AM	0.29	1	2	NA
	PM	0.32	1	6	NA
Missenden Road/ King Street	AM	0.82	23	294	B
	PM	0.78	21	220	B

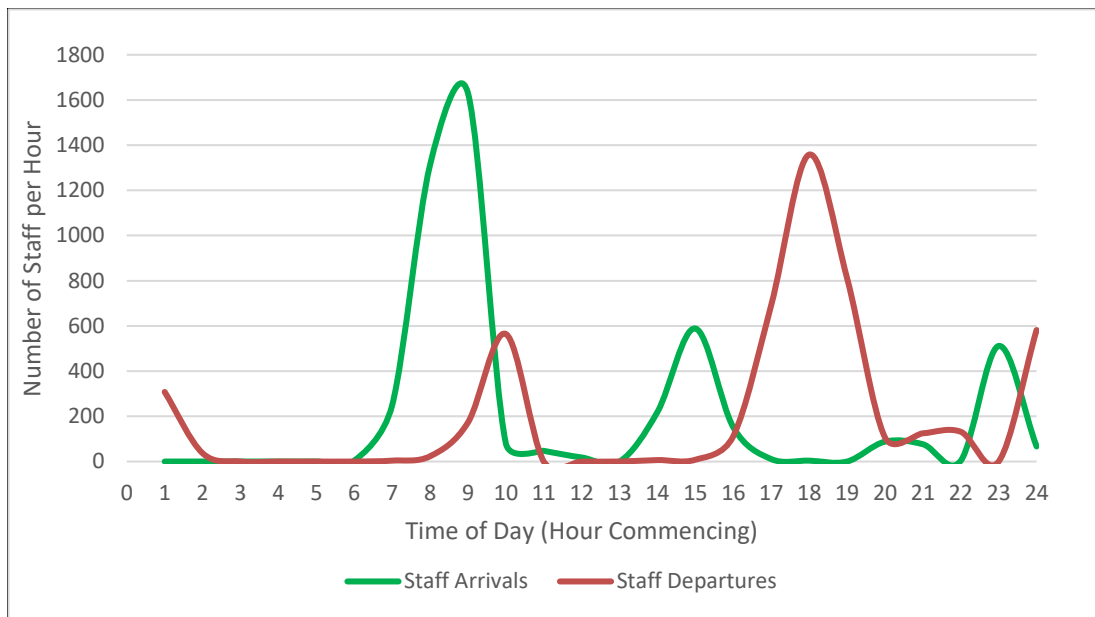
On the basis of the above assessment, the majority of the local priority controlled intersections operate within acceptable limits. The signalised intersections along Carillon Avenue and Parramatta Road experience some delay, particularly on the minor approaches during peak periods. This is regularly acceptable for such minor roads where they intersect with major road corridors and generally expected.

2.7 Existing Staff Movements

Details of RPAH typical staff shift times across a standard working week was provided for the purposes of this assessment. This information was used to understand staff start and finish times, and from there, estimate the likely staff arrival and departure periods for the purposes of assessing parking demand across the precinct, particularly for the future MSCP.

A summary of the staff start and finish shift times during each hour of a typical working day is illustrated in Figure 2.15.

Figure 2.15: RPAH Staff Shift Times



Data Source: RPAH/ HI

This staff shift data indicates that the majority of RPAH shifts commence between 7:00am and 7:30am with a corresponding completion time of between 3:30pm and 6:00pm. Other less prominent peaks associated with evening and night shifts occur between 1:00pm and 3:00pm and between 9:30pm and 11:00pm.

It is noted that the above reflects the total number of staff rather reflecting the number of vehicles arriving and departing the RPAH precinct over a typical day. This information has been used as an accurate and recent guide for estimating the future traffic generation of the MSCP.

2.8 Car Parking

2.8.1 On-Site

The site currently provides approximately 30 on-site car parking spaces. These spaces are reserved for use by the existing child care facility and not generally used by RPAH staff or visitors.

2.8.2 Off-Site

Several car parking areas are available within the RPAH precinct providing a staff parking supply of 300 spaces, plus 77 visitor spaces and 70 spaces dedicated for use by fleet vehicles. An additional 600 spaces are currently allocated to staff in the existing Grose Street MSCP south of the site, with access via Grose Street (though noting that the rates charged by the private operator significantly exceed the Ministry fees policy and as a result, these spaces are poorly utilised by staff). In the short term, a further 427 spaces are currently available to staff and visitors in the existing MSCP, but are subject to public parking fee rates, meaning there is minimal staff use. These 427 spaces would not however be available for future use given their allocation to the private hospital.

On the above basis, while there are approximately 900 off-street spaces available to RPAH staff, patronage levels would be a fraction of this amount.

On-street public parking in the area is generally subject to short-term time restrictions, with at-grade off-street public car parks located opposite the site (on the eastern side of Missenden Road) and south-east of the site, with access provided via Salisbury Road (along Missenden Road).

2.8.3 Car Park Pricing

Casual parking fees for the Grose Street MSCP are \$5.00 for up to 1-hour, rising to \$20.00 for 3 or more hours.

A discount staff rate has been offered at a flat rate of \$9.00 per day. There is no security over these fee levels, given they have been increased three times since late 2015 by the private operator.

The proposed MSCP will comply with the Ministry of Health's Hospital Car Parking Fee Policy 2013, under which weekly staff parking fees will be \$21 inclusive of GST.

2.9 Public Transport

Sydney's Inner West, including the RPAH and surrounding Precinct is well served by bus and rail transport. The precinct is serviced by the Route 412 bus (City to Campsie), which operates along Missenden Road and Carillon Avenue/ Salisbury Road at 15-20 minute headways during peak and off-peak periods. Numerous additional bus routes also run along Parramatta Road and King Street, effectively connecting the precinct to the CBD, Inner West and inner South West Sydney.

The RPAH precinct is also located within a 10 to 15-minute walk of both Macdonaldtown and Newtown stations, which are both located on the T1 and T2 lines and are serviced by regular frequency services both within and outside peak periods.

The 412 bus route and locations of bus stops proximate to the site and RPAH precinct are shown in Figure 2.16 with the broader regional area Sydney Buses routes highlighted in Figure 2.17.

Figure 2.16: 412 Bus Route and Stop Locations

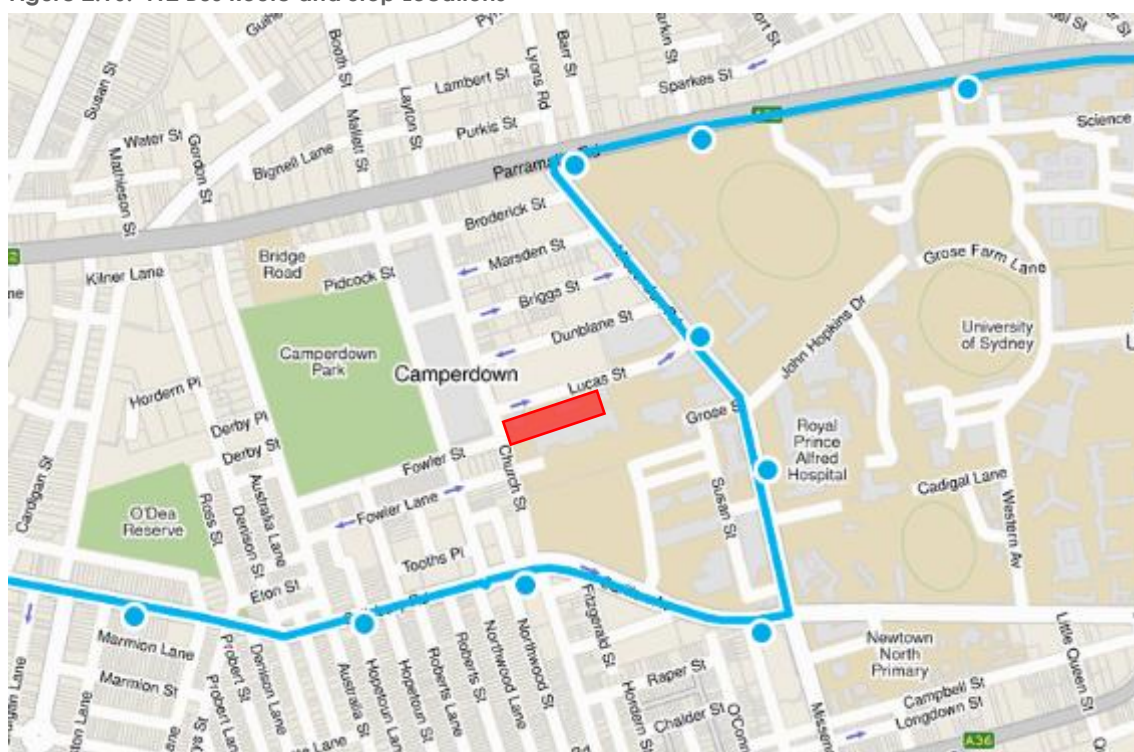


Image Source: www.transportnsw.info (accessed May 2016)

Figure 2.17: Existing Bus Services



Source: http://www.sydneybuses.info/routes/14054_STA_region_web_map_south.pdf, accessed May 2016

2.10 Pedestrian Infrastructure

Established pedestrian paths (>2m wide) are provided on both sides of Missenden Road, Parramatta Road and Carillon Avenue in the vicinity of the site. Narrower footpaths are also provided along Lucas Street and Church Street (generally in the order of 1 to 1.5m wide), which provide direct connectivity between the site and the RPAH and University of Sydney campus.

Church Street has also recently been upgraded to provide much wider footpaths in key locations, particularly adjacent to the site and on either side of Lucas Street. This has also improved pedestrian amenity and the level of north-south connectivity.

Several pedestrian crossing points (provided in the form of zebra crossings and signalised crossings) are located on Missenden Road, Parramatta Road and Carillon Avenue. The pedestrian footpaths on Lucas Street and Missenden Road, as well as the zebra crossing provided on Missenden Road south of Lucas Street, provide a direct pedestrian connection between the site and the main RPAH buildings. The total walking distance between these two locations via this route is in the order of 350m, or approximately 4-5 minutes' walk.

Given the student housing within Queen Mary building, the east-west connections across the RPAH precinct (and Grose Street) are a key link given the main hospital location and Sydney University further to the east. The zebra crossings, Brodie Street shared zone (delivered as part of the Marie Bashir Centre) and sightlines along Grose Street facilitate an adequate level of pedestrian safety within the campus.

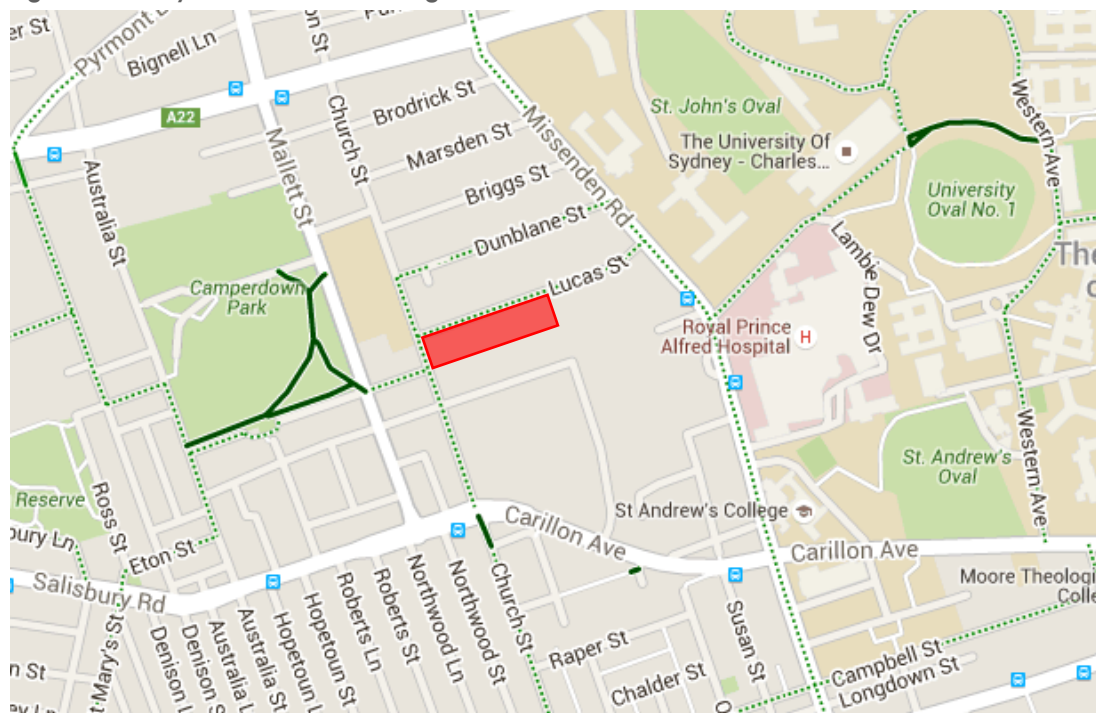
2.11 Cycle Infrastructure

There is an on-road bicycle route along Missenden Road which links the site to other routes to the north and south of Lucas Street. Lucas Street also forms part of the City of Sydney's cycle network

and operates as mixed traffic conditions, however is currently unmarked. A contra-flow bicycle lane is proposed on Lucas Street to connect Missenden Road with Church Street, along the site frontage.

On-road cycle routes provide access through the University of Sydney, whilst surrounding low- to medium-trafficked roads provide on-road cycle options in close proximity to the site, as shown in Figure 2.18.

Figure 2.18: Bicycle Routes Surrounding the Site



Source: <http://www.sydneycycleways.net/map/> (site visited May 2016)

Secure bicycle parking facilities are provided at several locations across the RPAH campus, as shown in Figure 2.19. End-of-trip facilities are also provided for staff, including bathrooms and shower facilities in each building. On-site observations and feedback from the SLHD indicate that there is generally some spare capacity across these bicycle parking facilities.

Figure 2.19: Bicycle Parking Facilities

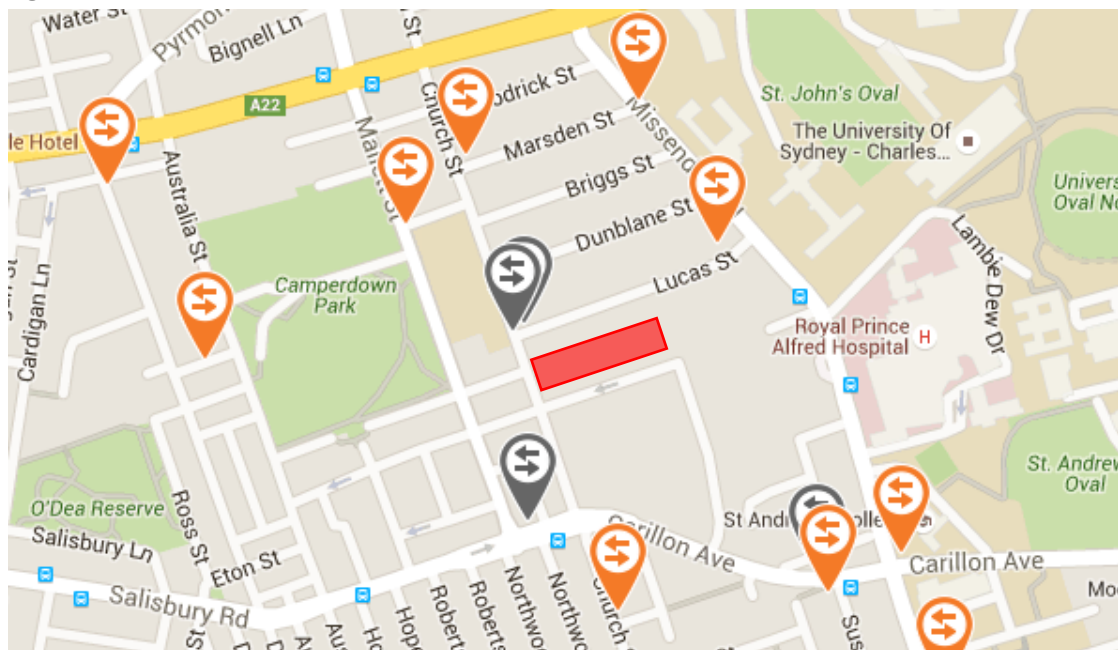


Source: <http://www.sldh.nsw.gov.au/pdfs/TAG/TAG-RPA.pdf> (site visited 29 August 2016)

2.12 Local Car Sharing Initiatives

There are several GoGet car sharing pods located within a short walking distance (~400m) of the subject site, including two pods located immediately adjacent to the site on Church Street, as shown in Figure 2.20.

Figure 2.20: GoGet Car Share Pod Locations



Source: <http://www.goget.com.au/find-cars> (site visited May 2016)

2.13 Other Initiatives

SLHD is investigating campus wide transport initiatives including a car pooling strategy. RPAH recently initiated a shuttle bus service between RPAH and Redfern Railway Station which runs at peak periods during the day and into the evening. The service has been well patronised and will be monitored and services expanded should its use continue to grow.

SLHD has been in negotiation with Sydney Buses to increase the frequency of bus services to RPAH. To date, there has been no increase in service to the campus.

2.14 Existing Transport Use

The 2006 and 2011 Census Journey to Work (JTW) data provides the most robust picture of existing travel patterns to the RPA precinct and broader Camperdown Health precinct. The smallest geographical area for which JTW data is available is known as a Travel Zone (TZ).

RPAH and University of Sydney occupy two TZs, namely TZ 236 (referred to as TZ 239 in the 2006 Census) and 238, with the proposed staff car park located in TZ 238, as shown in Figure 2.21. In order to gain a more robust understanding of travel mode share to the entire precinct, data from both TZs has been assessed.

JTW data has been analysed for both of these zones from both the 2006 and 2011 Censuses so as to determine the current mode of travel to work for people employed within the precinct and to determine changes in travel patterns over the two periods. The results of this analysis is summarised in Table 2.3.

Figure 2.21: Travel Zones 236 and 238



Image Source: NSW BTS JTW Explorer (<http://visual.bts.nsw.gov.au/tz>)

Table 2.3: 2006 and 2011 Census Journey to Work Data (TZ 236 & 238)

Mode	2006 Census	2011 Census
Car (as driver)	46.2%	44.7%
Car (as passenger)	4.5%	4.1%
Train	17.9%	19.0%
Walked only	13.5%	14.1%
Bus	12.1%	12.9%
Other*	5.8%	5.3%
Total	100%	100%

* Includes 'Mode not stated' but excludes 'Did not go to work'

Data Source: NSW BTS JTW Explorer

Analysis and comparison of the 2006 and 2011 Census JTW data for these two travel zones reveals the following:

- Car (as driver) is the dominant mode of travel to/ from work for people employed in the precinct, although this mode share was observed to fall between 2006 and 2011.
- Train was the most popular public transport mode, with an increasing mode share between 2006 and 2011.
- There was a slight increase in mode share for bus and walking between the two Census years, largely at the expense of car drivers and passengers.

While the increase in sustainable transport mode share indicates a slight shift away from car travel, the data still indicates that car travel is the predominant mode of travel to the precinct, with approximately 50% of all employees travelling to work via this mode. It can therefore be concluded that demand for parking in the area will continue to remain without the purposeful and targeted implementation of a range of travel management schemes.

3. Development Proposal

3.1 Overview

The proposal includes the construction a nine-storey staff car park on the site located on the corner of Lucas Street and Church Street, Camperdown. The car park has been designed as a User Class 1 car park and is to accommodate approximately 996 spaces for use by RPAH staff only.

The breakdown of all parking within the MSCP is illustrated in Table 3.1.

Table 3.1: MSCP Staff Car Parking Breakdown

Level	Car Space Type			Total
	Class 1 (standard)	Small Car Space	Disabled	
Level 0a	73	4	0	77
Level 0b	0	4	5	9
Level 1a	70	2	0	72
Level 1b	0	14	0	14
Level 2a	73	5	0	78
Level 2b	0	2	5	7
Level 3a	110	0	0	110
Level 4a	110	0	0	110
Level 5a	110	0	0	110
Level 6a	110	0	0	110
Level 7a	110	0	0	110
Level 8a	110	0	0	110
Level 9a	79	0	0	79
Total	955	31	10	996

The MSCP proposes entry via the south only along Grose Street/ Hospital Road and into Brodie Street via a one-way westbound traffic lane. Direct exit driveways to Church Street to the west and Lucas Street to the north are proposed to ensure a relatively even distribution of vehicles.

Further details relating to the site access arrangements are provided in Table 3.2 with the ground level plan shown in Figure 3.1.

Table 3.2: Proposed MSCP Access Arrangements

Direction	Location			
	Brodie Street	Church Street	Lucas Street	Summary
Entry	Two entry lanes and boom gates providing access to Level 1	No entry	No entry	Two entry lanes via a single entry location
Exit	No exit	One exit lane and boom gate from Level 0	One exit lane and boom gate from Level 0	Two exit lanes across two exit locations

Figure 3.1: Ground Level Plan



Source: Cardno

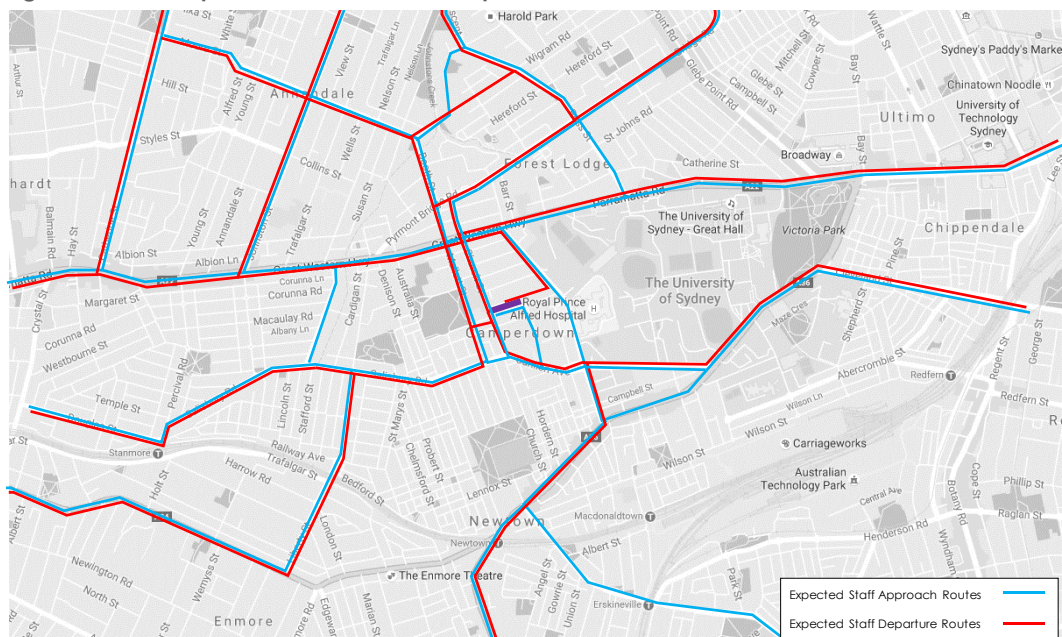
Given that the surrounding road network generally includes local streets, including one-way streets and various turning bans at key locations in the vicinity, the impacts on local streets have already naturally been mitigated as much as feasible. The sole entry route via the Carillon Avenue traffic signals at Grose Street allows for a convenient vehicle access that is limited to the regional road network and one that aims to further minimise the impacts on local streets in the immediate vicinity.

The vehicle exits are distributed across the network and are accommodated by direct north-south connections to/ from the regional road network. There will be some increase in traffic movements along Church Street, Lucas Street and a short section of Fowler Street in the afternoon when staff would be exiting the MSCP. However, the staff shift finish times tend to have a greater spread in the afternoon than in the morning, thus mitigating this impact as much as practical. Also critical to the arrival and departure routes is recognition of the existing emergency vehicle travel paths and the need to maintain these at all times.

It should be noted that these traffic routes are also already used by RPAH staff given existing parking arrangements and the current preference in many instances, for staff to park on-street along the surrounding local streets where parking is either unrestricted, or for night shift workers, where night-time parking is unrestricted.

To illustrate this further, the broadly anticipated staff arrival and departure routes are shown in Figure 3.2.

Figure 3.2: Anticipated Staff Arrival and Departure Routes



Basemap source: Google Maps

4. Car Parking

4.1 Car Parking Assessment

As discussed, NSW Health assessed the need for provision of a staff only MSCP within the RPAH campus. The assessment identified an existing staff parking demand associated with the morning shift of approximately 1,700-1,800 vehicles based on a detailed assessment with consideration of the following:

- existing staff FTE including typical Visiting Medical Officers (VMO)
- breakdown across shifts
- proportion of staff who currently drive to work
- average vehicle occupancy.

Given that there are approximately 900 off-street spaces available for use by staff, this equates to a shortfall of 800-900 spaces. On this basis, the proposed car parking supply of 996 spaces is suitable to accommodate a portion of this shortfall, as well as allowing for demand associated with the peak staff changeover and some of the anticipated future growth.

Furthermore, the proposed MSCP would significantly help to mitigate the effects of staff parking within the local streets.

4.2 Car Parking Layout Review

The car park layout has been reviewed against the requirements of the Australian Standard for Off Street Car Parking (AS/NZS2890.1:2004 and AS/NZS2890.6:2009). This assessment included a review of the following:

- bay and aisle width
- adjacent structures
- circulation roads and ramps
- ramp grades
- height clearances
- internal queuing
- parking for persons with disabilities.

This review confirms that the proposed car parking layout is expected to operate satisfactorily and comply with the dimensional requirements of the relevant Standards for a User Class 1 car park, noting that a User Class 1 car park is acceptable for use as a long term staff car park only.

The car park layout has considered the site's location within a constrained high density urban area together with its specific limitations, most notably the narrow and long footprint. The layout has resulted in a proposed MSCP that ensures ample queuing area along Brodie Street to accommodate the peak staff arrivals during the weekday AM peak period, noting that queuing in excess of 10 vehicles is not anticipated at any time. This amount of queuing can largely be accommodated within the building footprint.

There will be no direct entry for vehicles from Church Street into Brodie Street and the MSCP. Appropriate measures, likely to be a boomgate, will be installed at the western end of Brodie Street to ensure vehicles are able to exit, though prevent vehicles from entering.

The amount of vehicle circulation has been minimised as much as practical throughout. The clockwise vehicle entry route ensures all vehicles pass available parking spaces by use of 'split'

ramps at either end of the car park. The exit 'speed ramp' system will ensure vehicles are able to circulate efficiently when exiting the MSCP.

The location of the entry point results in minimal impact on the surrounding local streets and recognises the importance of maintaining Brodie Street for use by staff/ visitors to the adjacent Marie Bashir Centre only. In light of this, it is important that the existing boomgate infrastructure is activated daily to ensure no staff are able to enter the MSCP directly via Brodie Street and Missenden Road. The exit driveways spread car park traffic effectively between Church Street, Mallet Street and, to a lesser extent, Lucas Street.

The location of the entry point also largely removes incentives for vehicles to use Missenden Road on approach, especially having regard to this being the key north-south emergency vehicle route to/ from the Hospital.

An appropriate quantum of disabled car spaces (in the context of the role and function of the car park) has also been provided and is in accordance with AS2890.6:2009, specifically Figure 2.4 in section 2.2.2 and the Building Code of Australia (BCA).

A threshold parking guidance system is recommended to readily indicate to staff arriving, the amount of available spaces. This should include an electronic sign at the corner of Hospital Road/ Brodie Street and another at the entry point to ensure an accurate decision can be made prior to entering the MSCP and avoid unnecessary circulation and time.

A full compliance review and swept path assessment demonstrating the accessibility of the entry and exit locations, queuing capacity, as well as manoeuvrability at key locations within the car park is included in Appendix C.

5. Sustainable Transport Infrastructure

5.1 Walking and Cycling Network

The MSCP design will ensure easy use of the existing pedestrian infrastructure internal to the north-west precinct, which provides direct connectivity between the site and RPAH. Pedestrian connections are also provided via the Brodie Street shared zone, and along Lucas Street and Missenden Road, allowing the MSCP to be accessed via a range of direct, safe and well-utilised pedestrian routes. Cyclists are not expected to interface directly with the MSCP, however cyclist movements have been considered in the design of the MSCP access points.

5.2 Public Transport

As noted in Section 2.9, the site is serviced by bus services stopping along Missenden Road in close proximity to the site. Other bus services also operate along Parramatta Road to the north, providing access to the CBD and a number of areas within western Sydney. The precinct is also located via a 10-15 minute walk from Redfern, Macdonaldtown and Newtown railway stations, all of which provide a high level of public transport connectivity, particularly to the CBD and other Inner West suburbs.

5.3 Sustainable Transport Measures

The purpose of the proposal is to address a long term shortfall in RPAH staff parking, with bicycle parking facilities provided elsewhere on the RPA campus. There is also no requirement for bicycle parking provision under any planning controls or guidelines for the car park facility.

The location of the site and proximity to other RPAH destinations does not lend itself to being an appropriate location for bicycle facilities. Bicycle parking and end-of-trip facilities need to be located close to the desired destinations.

In order to facilitate an increase in daily cycling to/ from work by RPAH staff, SLHD provides end-of-trip facilities in convenient locations at key building entrances and based on a campus-wide approach. The campus also achieves a healthy travel mode choice and the proposal does not intend to make driving private cars a more attractive alternative, rather simply addressing a demand that has and will continue to persist, mostly as a result of shift workers and future growth.

RPA does however implement strategies to encourage staff to travel to work by a range of transport modes, and encourages mode shift away from private car travel. Some key examples being investigated include:

i **Increase car-pooling/ car share use.**

- Combined with other nearby activity and employment generators (i.e. the wider RPAH precinct, University of Sydney campus, St Andrew's College etc.) a car-pooling system is a viable option to encourage staff to join.
- Staff could be provided access to corporate GoGet membership and car share for work related trips. Use of nearby car sharing pods (the number of which is likely to continue increasing) is also a viable alternative for staff that occasionally need to undertake a personal trip during the workday. A car share vehicle could also be located on-site, pending feasibility (noting the potential availability of hospital pool vehicles).

- Access to the existing RPAH staff car pool system to reduce single driver private car usage rates.
- ii **Eliminate/ do not provide driving incentives.**
 - The site will provide car parking that is very much in demand by existing staff. There is potential to reduce incentives to use a car for work purposes. For staff this has historically included car packaging, parking included in salary, petrol reimbursement, etc.

Specific programs to achieve travel behaviour change need to be measurable, through car parking occupancy surveys or through a staff travel survey. Using these metrics, performance can be tracked against any such broader precinct travel plan objectives; to recognise what programs are working and link program funding to results.

6. Traffic Impact Assessment

6.1 Traffic Generation

6.1.1 Preamble

Overall, the approach has been to limit unnecessary traffic related impacts on the surrounding local streets, noting the use of Missenden Road has been limited to purposely limit impacts to the main Hospital frontage that already experiences some degree of congestion. Emergency vehicles also require this key north-south route to remain as free as possible at all times.

It is important to recognise that the proposal accommodates existing RPAH staff demand for parking, with the traffic impacts more about redistribution rather than 'new' vehicle trips in the area generally.

Notwithstanding the above, this traffic impact assessment considers all local traffic as new vehicles to the immediate road network, with logical reduction factors applied to intersections on the periphery of the precinct. This appropriately accounts for such vehicles that are already in the precinct on a daily basis and parking in the local streets.

The reduction factors have been applied at the following locations:

- Parramatta Road/ Bridge Road
- Parramatta Road/ Missenden Road
- City Road/ King Street/ Carillon Avenue
- King Street/ Missenden Road.

Further to the above, this assessment has adopted a conservatively high approach and substantiated by the following additional characteristics:

- based on accurate and detailed staff shift information provided by SLHD, the peak arrivals are expected to occur daily between 6:30am and 7:30am
- the peak MSCP traffic generation has been assessed during the later peak hour between 7:00am and 8:00am that sees more background peak period traffic activity
- no reduction factor applied to account for existing vehicles already known to be in the local area and parking on-street (circulating vehicles disproportionately skew local area traffic volumes).

The aim of the proposed MSCP is to provide additional parking for staff working at RPAH. It could therefore be reasonably expected that the arrival patterns for vehicles accessing the staff car park would correlate with overall arrivals associated with the known RPAH staff shift times. As such, the following estimates draw on the staff shift information provided by RPAH, as previously detailed.

6.1.2 Morning Peak Period

The trip generation of the proposed MSCP is expected to largely be determined by the available supply of car parking within the MSCP and its turnover during peak periods. In the case of the AM peak period, the capacity of the car park will be determined by the number of night shift staff vehicles remaining within the MSCP.

The predominant peak staff arrival occurs prior to 7:30am, where those staff that start their shift at 7:00am or 7:30am would be arriving prior to commencement of work. At this point there is overlap between these staff and the night shift staff, whose shifts typically finish at or after 7:30am in order

to allow for handover to the day shift staff. As such, many night shift staff vehicles would still be parked at the time when day shift staff arrivals are at their peak.

The analysis of staff shift data indicates that some 640 staff shifts end between 6:30am and 9:30am. In terms of travel mode share, given that almost all of these shifts commence after 9:00pm, it would be expected that non-car mode shares would be lower than those during the day, as staff would be less likely to walk/ cycle after dark, and public transport services operate less frequently during these periods. As such, assuming a 70% car driver mode share (some 25% greater than that across the day period), it could be anticipated that approximately 450 cars would still be parked in the MSCP until after the peak AM arrival has occurred the next morning.

Based on this, it is assumed that the remaining 550 spaces would generate one vehicle movement prior to 7:30am, 500 of which would be expected to occur in the site generated peak hour (6:30am-7:30am). The directional split would also be heavily skewed to entering vehicles, with an anticipated 90:10 arrival: departure split.

Based on these assumptions, the MSCP would be expected to generate 450 entry and 50 exit movements during the AM peak hour. This AM peak hour is expected to occur between 6:30am and 7:30am, noting that this is earlier than the known broader road network peak hour that occurs between 7:45am and 8:45am.

Notwithstanding this, the traffic analysis presented as part of this report has considered the existing background traffic between 7:00am and 8:00am to allow for uncertainties raised by various stakeholders as part of the Public Exhibition. Modelling any later would be an ineffective given staff shift times confirm that the MSCP would simply be full and the only activity would be far less and mostly just staff finishing their night shifts. This assessment is therefore considered suitably conservative and robust.

6.1.3 Afternoon Peak Period

Given that the AM peak arrivals are governed by the number of vacancies, the number of departures during the PM peak period is also likely determined by the same measure. These PM vehicle departures are almost exclusively day staff who would have arrived during the AM peak period.

Analysis of the staff shift data indicates that the PM peak staff departure is expected to occur between approximately 4:00pm and 5:00pm. This period (and 15 minutes either side) see approximately 1,350 shifts end, which compares to the nearly 2,500 shifts that start during the AM peak hour, or some 55% of the number of staff arriving in the morning.

Accordingly, it has been assumed that the number of departures during the PM peak is equivalent to 55% of the number of arrivals during the AM peak, and vice versa. This assumption is consistent with GTA experience of hospital staff arrival and departure patterns, the latter of which are typically more spread out across the whole afternoon (from 1:30pm through to 6:00pm), as opposed to the more concentrated AM start times.

Application of this to the previous estimates results in the MSCP being expected to generate some 275 vehicle movements in the PM peak hour, of which 250 would be departing and 25 arriving.

6.1.4 Traffic Generation Summary

Based on the assumptions detailed above, the anticipated traffic generation of the proposed MSCP during the AM and PM peak hours is summarised in Table 6.1.

Table 6.1: Estimated MSCP Traffic Generation

Proposed Use	No. of Spaces	Trip Generation (vehicles/ hour)					
		AM Peak (6:30am-7:30am) [1]			PM Peak (4:30pm-5:30pm)		
		Arrivals	Departures	Total	Arrivals	Departures	Total
To/from car park	996 spaces	450	50	500	25	250	275

[1] This assessment conservatively assumes the peak hour to be between 7:00am and 8:00am and appropriately balances out site generated traffic with the broader road network peak

This assessment also recognises that while the proposed MSCP will generate some vehicular activity during the typical weekday AM and PM peak periods, most staff traffic movements will occur prior to the broader road network peaks, particularly during the largest AM activity.

With this in mind, the proposal goes some way to recognising the requirements in relation to development specifically for the purposes of a car park, as detailed in Sydney Local Environmental Plan 2012 (Division 4 Clause 7.18). This includes not encouraging travel by private vehicles during the typical weekday AM and PM peak periods, together with the need to not adversely impact on the congestion of roads, particularly the movement of public transport services.

6.2 Distribution and Assignment

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

- i configuration of the regional road network in the immediate vicinity of the site
- ii existing operation of intersections providing access between the local and regional road network
- iii distribution of households in the vicinity of the site
- iv likely distribution of RPAH staff residences in relation to the site
- v configuration of access points to the site.

Given the one-way nature of many roads in the area and limitations on turning movements at intersections within the vicinity of the site, the entry and exit distributions vary. These assumptions adopted in this assessment, as they apply to the road network in the vicinity of the site, are detailed in Figure 6.1.

Based on these distribution assumptions and the estimated traffic generation as detailed above, the estimated AM and PM peak hour traffic volumes generated across the local road network by the proposed MSCP are shown in Figure 6.2.

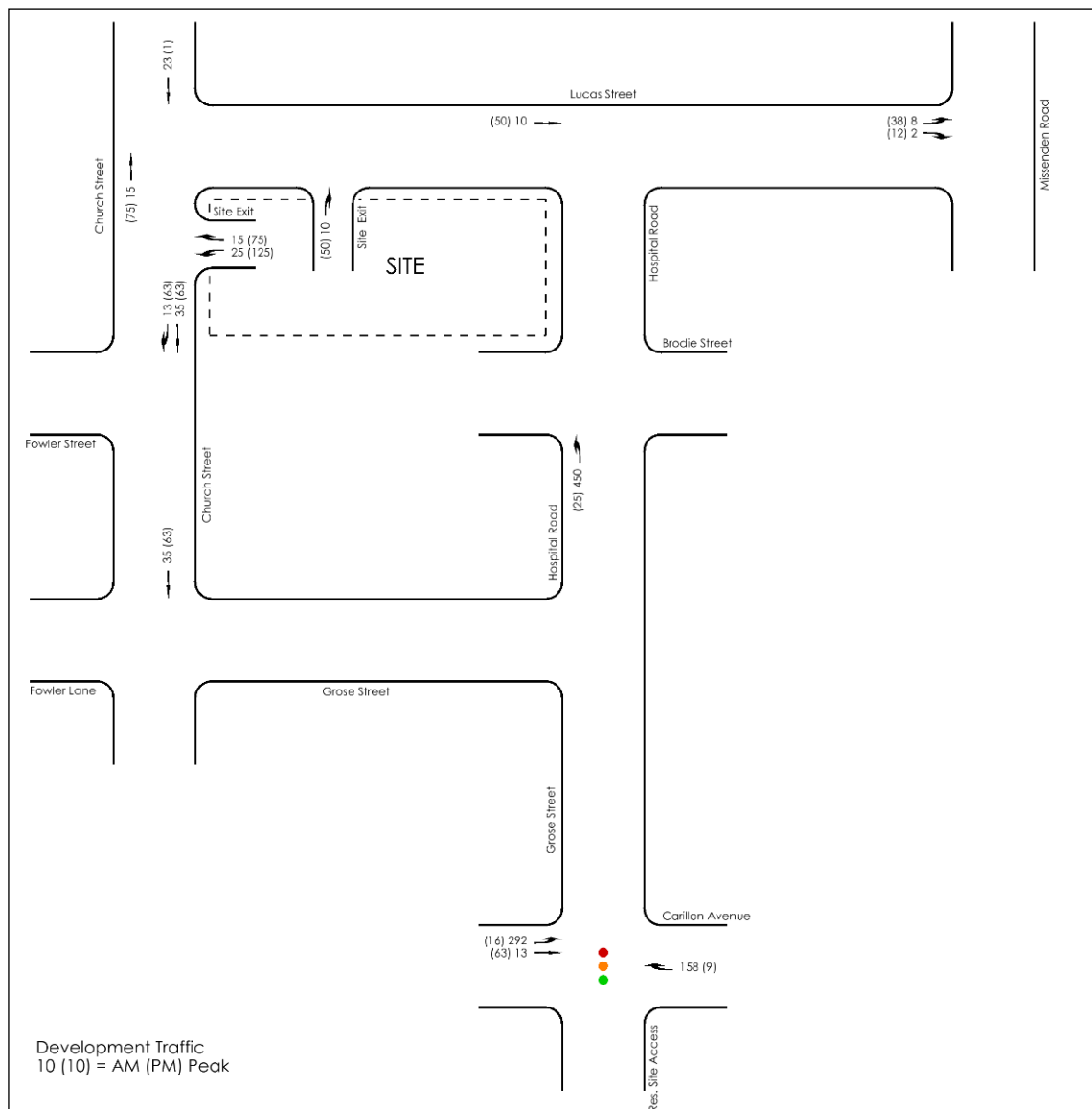
Following more recent consultation with RMS, the traffic impacts on intersections on the periphery have also been assessed. The impact at these locations has also taken into account a significant reduction factor to allow for existing traffic that is already known to be on the road network. While this assessment considers several key intersections, impacts on local streets such as Marsden Street and Dunblane Street (during the AM) and Briggs Street (during the PM) are not considered significant. For example, the priority controlled intersection of Missenden Road/ Marsden Street has been modelled as part of this assessment, albeit with no actual traffic assigned to it. To test its sensitivity to change, traffic was assigned to it with nominal change to the intersection operation even when considering the bunched approach given the upstream traffic signals. No impact would be experienced at the signalised intersection of Parramatta Road/ Missenden Road/ Lyons Road.

The map shows the following streets and landmarks:

- Streets:** Parramatta Rd, Missenden Rd, Brodrick St, Rydges Camperdown, Marsden St, Briggs St, Mallett St, Dunblane St, Church St, Lucas St, Grose St, Fowler St, Tooth Ln, Gibbins St, Salisbury Rd, Australia, Hopetoun St, Roberts St, Northwood Ln, Church St, Fitzgerald St, Brown St, Camillon Ave, Brown St, Susan St, O'Connell St, Aylesbury St, Grose Farm Ln, John's Hopkins Dr, RPA, Missenden Rd, Susan St, O'Connell St, Aylesbury St.
- Landmarks:** Sax & Woodwind, Victory Ln, Mallett Street Campus - University of Sydney, Camperdown Park, Consulate-General of the People's Republic of China, Lucas St, Grose St, Tooth Ln, Gibbins St, Salisbury Rd, Australia, Hopetoun St, Roberts St, Northwood Ln, Church St, Fitzgerald St, Brown St, Camillon Ave, Brown St, Susan St, O'Connell St, Aylesbury St, St Andrew's College, Sydney University, St John's Oval, The University Of Sydney - Charles..., Royal Prince Alfred Hospital.
- COVID-19 Case Data (Arrows):**
 - Red arrows (Higher percentages): 13%, 2%, 10%, 15%, 5%, 10%, 15%, 5%, 10%, 15%, 25%, 10%, 25%, 5%, 10%, 2%, 10%, 25%, 5%, 17%, 8%, 2%, 2%, 3%, 22%, 11%.
 - Green arrows (Lower percentages): 3%, 2%, 10%, 15%, 5%, 10%, 15%, 5%, 10%, 15%, 25%, 10%, 25%, 5%, 10%, 2%, 10%, 25%, 5%, 17%, 8%, 2%, 2%, 3%, 22%, 11%.

32

Figure 6.2: Peak Hour Site Generated Traffic Volumes



It is noted that the volumes presented above detail the full traffic generation of the MSCP and do not consider any discount for traffic arising from the cessation of the existing use on-site, nor the redistribution of traffic currently parking in other areas within or near the precinct. Accordingly, these traffic volume estimates present a conservatively high estimate of the likely increase in traffic resulting from the proposed MSCP.

6.3 Traffic Impact

An assessment of the impacts that the additional MSCP traffic would have on the surrounding road network can be made by comparing intersection performance prior to and following completion of the MSCP.

The impact of this additional traffic on the intersections in the vicinity of the site and broader precinct has been assessed using SIDRA Intersection. Table 6.2 presents a summary of the anticipated future operation of the key intersections following the completion of the MSCP, with full results included in Appendix B.

Table 6.2: Future Development Traffic

Intersection	Peak	Degree of Saturation (DOS)	Average Delay (sec)	95th Percentile Queue (m)	Level of Service (LOS)
Lucas Street/ Church Street	AM	0.08	1	2	NA
	PM	0.11	1	1	NA
Lucas Street/ Missenden Road	AM	0.25	1	1	NA
	PM	0.27	1	3	NA
Church Street/ Fowler Street	AM	0.09	3	2	NA
	PM	0.14	3	5	NA
Church Street/ Grose Street/ Fowler Lane	AM	0.07	1	2	NA
	PM	0.10	2	3	NA
Lucas Street/ New Road	AM	0.04	1	0	NA
	PM	0.04	2	1	NA
Brodie Street/ New Road	AM	0.26	6	1	NA
	PM	0.17	5	1	NA
Parramatta Road/ Mallett Street	AM	0.99	15	149	A
	PM	0.94	13	114	A
Parramatta Road/ Layton Road/ Church Street	AM	0.71	4	31	A
	PM	0.64	7	63	A
Salisbury Road/ Mallett Street	AM	0.95	16	238	B
	PM	0.77	10	80	A
Carillon Avenue/ Grose Street	AM	0.81	9	85	A
	PM	0.34	8	47	A
Carillon Avenue/ Missenden Road	AM	0.80	40	189	C
	PM	0.96	53	221	D
Parramatta Road/ Missenden Road/ Lyons Road	AM	0.80	18	150	B
	PM	0.93	33	394	C
Parramatta Road/ Bridge Road	AM	0.99	15	171	B
	PM	0.76	9	90	A
Carillon Avenue/ City Road	AM	0.90	36	336	C
	PM	0.68	24	173	B
Missenden Road/ Marsden Street	AM	0.29	1	2	NA
	PM	0.32	1	6	NA
Missenden Road/ King Street	AM	0.83	23	302	B
	PM	0.81	21	221	B

The results indicate that most intersections continue to operate within acceptable limits or similar to pre-development operation. This includes the key intersections on the periphery and along the Parramatta Road corridor.

The intersection of Parramatta Road/ Mallett Street does experience some additional queuing for the Mallett Street approaches, noting that the overall intersection operation (and Parramatta Road function) remains fairly consistent with existing conditions.

The specific need or otherwise for any such intersection modifications would need to be investigated further, with any such implementation to be determined in consultation with RMS.

As discussed throughout, the signalised intersection of Carillon Avenue/ Grose Street will need to accommodate a significant proportion of the proposed MSCP traffic. Naturally, there would be impacts to the function and operation of this intersection as a result of the proposal, especially when considering the cumulative impacts of this proposal and the private hospital. That said, the private hospital would also see the majority of the AM peak arrivals after 8:00am and certainly on the edge of peak generation associated with the proposed MSCP. The mitigations to impacts on the intersection are likely to only require line marking and removal of kerbside parking in order to maintain an acceptable intersection level of service. These potential modifications are illustrated in Figure 6.3 (existing) and Figure 6.4 (potential future).

Figure 6.3: Existing Intersection Layout

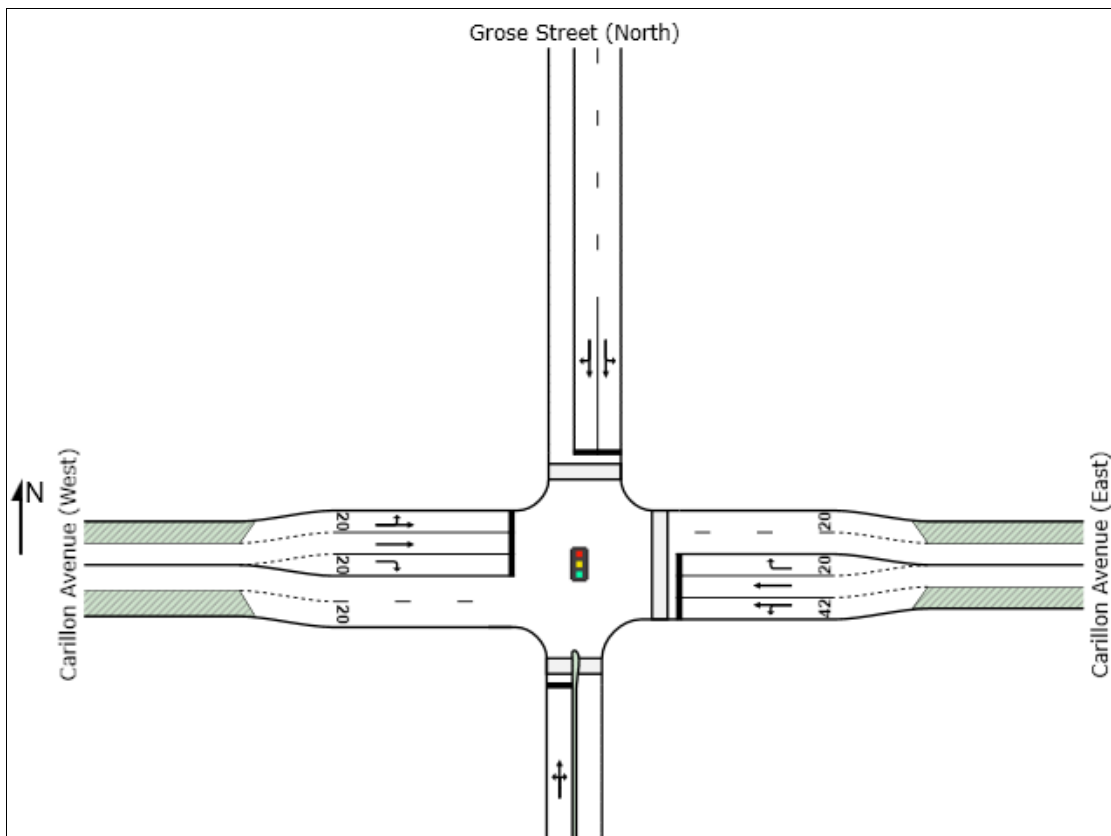
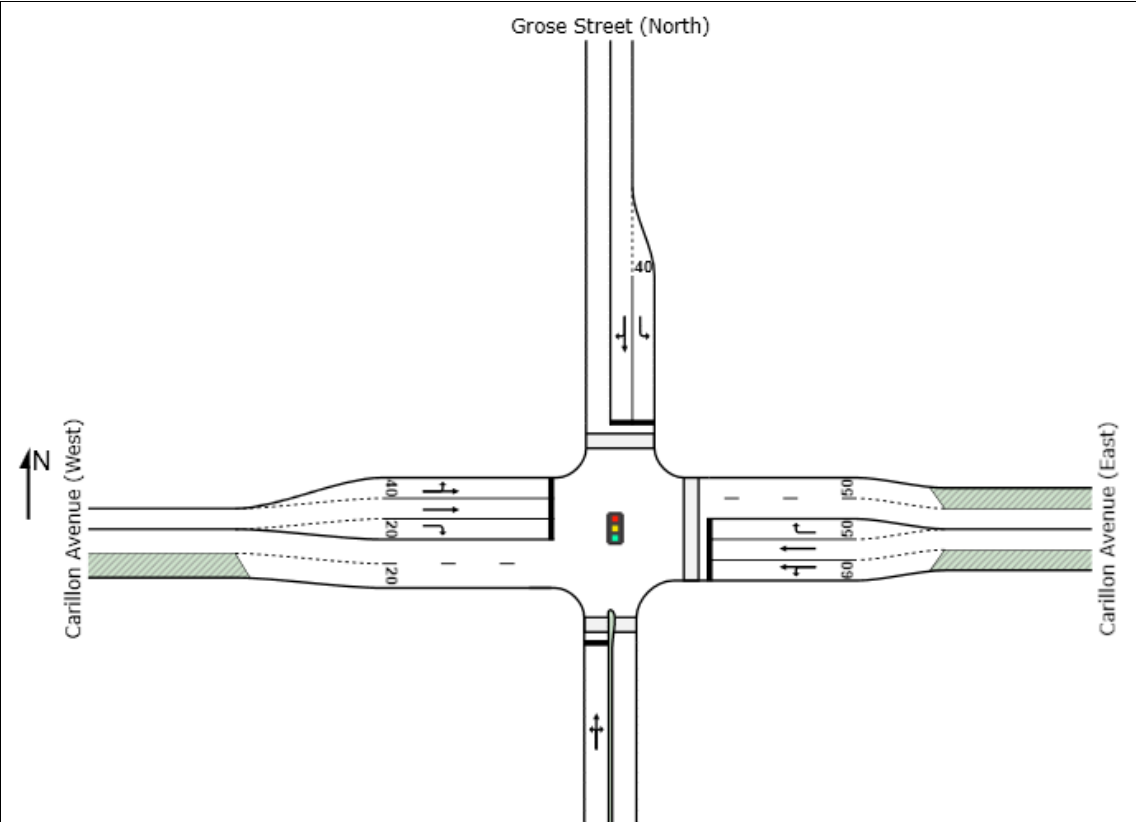


Figure 6.4: Potential Future Intersection Layout



7. Construction Traffic Impact

This overview of construction traffic impacts associated with construction activity aims to ensure the safety of all workers and road users in the vicinity of the MSCP construction site. The primary objectives of the Construction Traffic Management Plan (CTMP) outline below includes the following:

- To identify the need for adequate and compliant traffic management requirements within the vicinity of RPAH precinct.
- To ensure continuous, safe and efficient movement of traffic for both the general public and construction workers.
- Establishment of a safe pedestrian environment in the vicinity of the site
- To inform the Contractor and set the ground rules for managing the construction traffic associated with the construction site.

7.1 Overall Principles of Construction Traffic Management

The overall principles of traffic management during the construction activity include:

- provide an appropriate and convenient environment for pedestrians
- minimise the impact on pedestrian movements
- maintain appropriate capacity for pedestrians at all times on footpaths around the site
- maintain appropriate public transport access
- maintain current levels of parking within the precinct
- maintain permanent access to/ from the hospital accesses for emergency services
- restrict construction vehicle movements to designated routes to/ from the site
- manage and control construction vehicle activity in the vicinity of the site
- minimise impacts to general traffic in the vicinity of the site.

7.2 General Requirements

In accordance with RMS requirements, all vehicles transporting loose materials will be required to have the entire load covered and/ or secured to prevent any large items, excess dust or debris being deposited onto the roadway during travel to and from the site. All subcontractors and suppliers must be inducted by the Principal Contractor to ensure that the procedures are met for all vehicles entering and exiting the construction sites. The Principal Contractor will monitor the roads leading to and from the site and take all necessary steps to clean any debris deposited by construction vehicles.

Vehicles operating to, from and within the site shall do so in a manner which does not create unreasonable or unnecessary noise or vibration.

No tracked vehicles will be permitted on any paved roads. Public roads and access points will not be obstructed by any materials, vehicles, refuse skips or the like, under any circumstances.

7.3 Work Hours

The hours of operation will be as approved by the approval authority. No works will occur outside the nominated hours unless prior approval is granted by the Department of Planning and Environment and/ or City of Sydney.

7.4 Construction Worker Parking

Given that parking is in high demand within the RPAH precinct, construction workers should be encouraged to car pool and/ or make use of the available public transport for travel to and from the site. Some limited parking may be possible on-site, within the nominated construction compounds, which should be clearly separated from existing staff parking areas.

7.5 Construction Traffic Volumes

Traffic generated by the construction works will include construction worker light vehicles (including utility vans), as well as heavy vehicles for periodic delivery and removal of materials, including plant and equipment. Vehicle types and sizes would vary depending on the required use, but include medium and large rigid vehicles and articulated vehicles for import of bulk materials or minor spoil removal, as well as concrete trucks.

The level of construction vehicle activity is unknown at this stage but would be quantified prior to construction, once a contractor has been appointed.

Overall the construction works could not be expected to significantly impact intersection operation external to the site. This includes the Carillon Avenue/ Grose Street intersection. This also assumes that construction vehicle activity will be timed to mostly occur outside typical weekday AM and PM peak hours.

Any works on weekends would not present significant traffic related impacts, with no known specific restrictions limiting access and/ or the work hours as specified.

All works within the site and associated vehicle movements will be restricted to the permitted working hours of the site. Detailed site access will be set out in the detailed plan to be completed by the appointed contractor.

7.6 Site Access

Access to this site is anticipated to be to/ from Brodie Street via the signalised intersection of Carillon Avenue/ Grose Street to the south. While use of other local streets should not be encouraged, use of other routes can be assessed as part of a detailed Construction Traffic Management Plan.

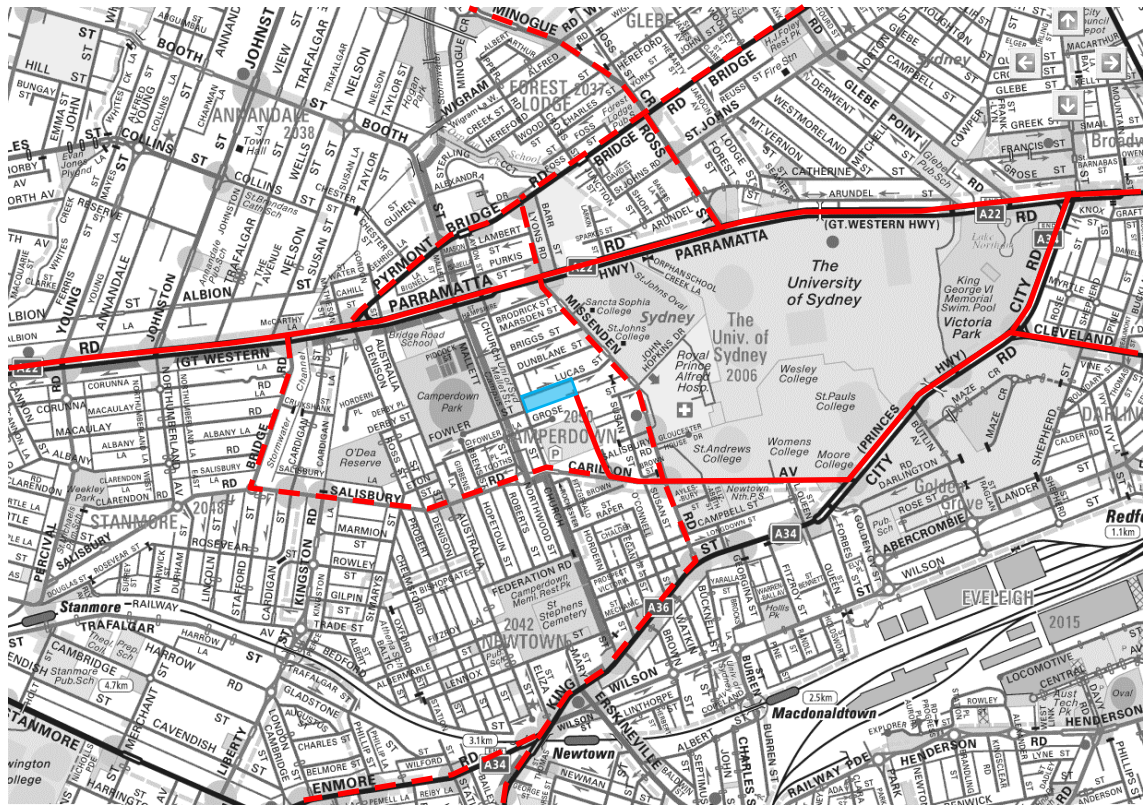
7.7 Construction Vehicle Routes

Generally, construction vehicles will have origins and destinations from a wide variety of locations throughout Sydney. However, all construction vehicles are to be restricted to the State and Regional Road network where possible. Construction vehicles should, where practical avoid use of local streets surrounding the site.

As such, likely construction vehicle routes have been developed with the aim to provide the shortest distances to/ from the arterial road network, whilst minimising the impact of construction traffic on streets in the vicinity of the site. Alternative routes would not be used without specific prior approval from the appropriate stakeholders. No trucks will be permitted to layover on approach to the work site.

Truck drivers will be advised of the designated truck routes to/ from the site. The primary and secondary truck routes are shown in Figure 7.1.

Figure 7.1: Construction Vehicle Approach and Departure Routes



It is recommended that a detailed CTMP be prepared prior to works commencing on-site.

7.8 On-street Works Zones

If the Principal Contractor requires the use of a Works Zone they would be required to liaise with and obtain approval from the relevant authority (Council, TfNSW/ RMS).

7.9 Special Deliveries

It is not anticipated that any special deliveries will be required however, if any vehicle larger than 19 metres in length is required to access the site, access will only be granted following an approval from the relevant authorities (Council, TfNSW/ RMS).

7.10 Traffic Control Plans

Notwithstanding the limited impacts of construction on traffic operation of the surrounding network, Traffic Control Plans (TCPs) would need to be prepared to appropriately manage the use of the designated construction routes and site interfaces, and submitted to Council and/ or RMS if required by a Section 138 permit under the Roads Act. TCPs would also be required to obtain any appropriate Road Occupancy Licences and Road Opening Permits required by RMS and/ or Council.

As part of implementation of the TCPs, standard signage warning approaching vehicles of the construction activity and heavy vehicle movements should be installed. This should include static signage to be in-place in advance of the works. Other possible mitigation measures to minimise traffic impacts during construction generally include:

- Appropriate traffic management, including static signs, manual traffic control and provision of temporary barriers to control the designated work areas and minimise delays.
- Establishment of safe access points to work areas from the adjacent road network including safety measures such as barriers and warnings to pedestrians, maintaining sight distance requirements and signage, and the provision of traffic management measures.
- Use of traffic controllers to negotiate pedestrian and construction vehicle priority and access, if required.

The TCPs should also outline how potential construction vehicle manoeuvres (and the size of the largest vehicle) could be accommodated in and out of the construction site.

7.11 Pedestrian Management

During the construction period, pedestrian movements throughout are to be maintained as much as feasible. Where works require the closure of an existing pedestrian route, a suitable alternative is to be provided. Class A hoarding/ fencing would be provided between pedestrian paths and any work site.

7.12 Public Transport

Given the infrequent heavy vehicle movements associated with the construction works, the overall impact to existing public transport services is expected to be negligible. This includes the impact on the identified local area bus services.

7.13 Emergency Vehicles and Heavy Vehicles

During construction, the Principal Contractor will ensure that there is no disruption to emergency vehicles on public and internal Hospital roads.

The sites location, well distanced from emergency services and departments associated with RPAH, will ensure any potential impacts on emergency access would be able to be effectively managed throughout the works.

7.14 Existing and Future Developments

It is the Principal Contractor's responsibility to liaise with Health Infrastructure and other landowners etc. should there be other potential future developments under construction at the same time. A coordinated approach to traffic management and wayfinding signage is logical in such instances.

7.15 Traffic Movements in Adjoining Areas

No adverse effects are expected from the movement of heavy vehicles through adjacent council areas.

8. Contractor Requirements

8.1 Construction Traffic Management Plan

Prior to the commencement of construction, a CTMP is to be prepared by the Principal Contractor. The CTMP should address the following:

- consultation with the consent authorities and relevant approvals
- the likely construction vehicle numbers and frequency
- approach and departure routes
- anticipated special out-of-hours or escorted deliveries
- parking access arrangements during construction
- contractor parking management measures
- construction work zone locations
- site entry and exit points
- proposed traffic control signage
- proposed traffic management at critical locations i.e. entrance to main Hospital
- provision of acceptable pedestrian management measures.

The Principal Contractor should implement, update and maintain the CTMP throughout the construction period and until completion.

8.2 Staff Induction

All workers and subcontractors engaged on-site would be required to undergo a site induction. The induction should include permitted access routes to and from the construction site for all vehicles, as well as standard environmental, WHS, driver protocols and emergency procedures. Additionally, the Principal Contractor will organise regular scheduled site inductions as required).

Any workers required to undertake works or traffic control within the public domain would be suitably trained and covered by adequate and appropriate insurances. All traffic control personnel would be required to hold RMS accreditation in accordance with Section 8 of *Traffic Control at Work Sites* (RMS, 2010).

8.3 Contact Details of the Site Manager(s)

Contact details should be provided by the Principal Contractor as part of their CTMP for the project.

8.4 Occupational Health and Safety

Any workers required to undertake works or traffic control within the public domain shall be suitably trained and will be covered by adequate and appropriate insurances. All traffic control personnel will be required to hold RMS accreditation in accordance with Section 8 of *Traffic Control at Worksites* (RMS, 2010).

8.5 Communications

The Principal Contractor is to prepare a communication plan to manage and provide updated to hospital staff/ visitors and the general public throughout the works. Appropriate site, warning and wayfinding signage are to be provided as necessary.

9. Conclusion

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

- i The proposed MSCP proposes 996 car spaces for use by RPAH staff and has been designed as a User Class 1 facility in accordance with AS2890.1:2004.
- ii The site is expected to generate up to 500 and 275 vehicle movements during the AM and PM peak hours respectively.
- iii The volumes of traffic entering the site at any one time will be influenced by the amount of available spaces and directly responds to RPAH staff shift times.
- iv The traffic generated by the proposed MSCP is not expected to adversely impact on the majority of the surrounding local intersections.
- v General traffic congestion through the area, particularly along Missenden Road should not be unreasonably impacted, assisted by the entry and exit locations and subsequent arrival and departure routes during the peripheral peak periods.
- vi The majority of the surrounding key intersections experience a minor change to operating conditions, noting the existing congestion levels at some key intersections.
- vii The key entry route via the signalised intersection of Carillon Avenue/ Grose Street would experience a fall in intersection efficiency. Line marking and some removal of on-street parking would largely address these impacts.
- viii The exit routes, although impacting the surrounding local streets recognise that there is a greater spread of staff departing in the afternoon. The impacts are also mitigated across several intersections, with the intended local street environment largely maintained, especially since the local area traffic management measures recently installed along Church Street.
- ix The MSCP has been designed in accordance with relevant Australian Standards, with boom gate capacity and circulation allowing for efficient use in a safe environment.
- x Brodie Street will provide the only entry point, with the existing Marie Bashir Centre boom gate to ensure no direct access to the site via Missenden Road. Entry will be via Grose Street from the south only with exits to Church Street and Lucas Street.
- xi The site layout ensures pedestrian connections internal to the RPAH precinct and via the Brodie Street shared zone are strengthened. Safe crossing points, including where Brodie Street intersects with Hospital Road will be included as part of design development.
- xii Staff should be encouraged to join the existing RPAH car pool services and other incentive programs to limit the upward pressure on parking demand within the precinct and associated ongoing issues.
- xiii Construction vehicles should, where practical avoid use of local streets surrounding the site on approach and departure.
- xiv Construction workers should be encouraged to car pool and/ or make use of the available public transport for travel to and from the site.
- xv A detailed Construction Traffic Management Plan should be prepared for the development prior to commencement of work, building on the outline provided in this report.

Appendix A

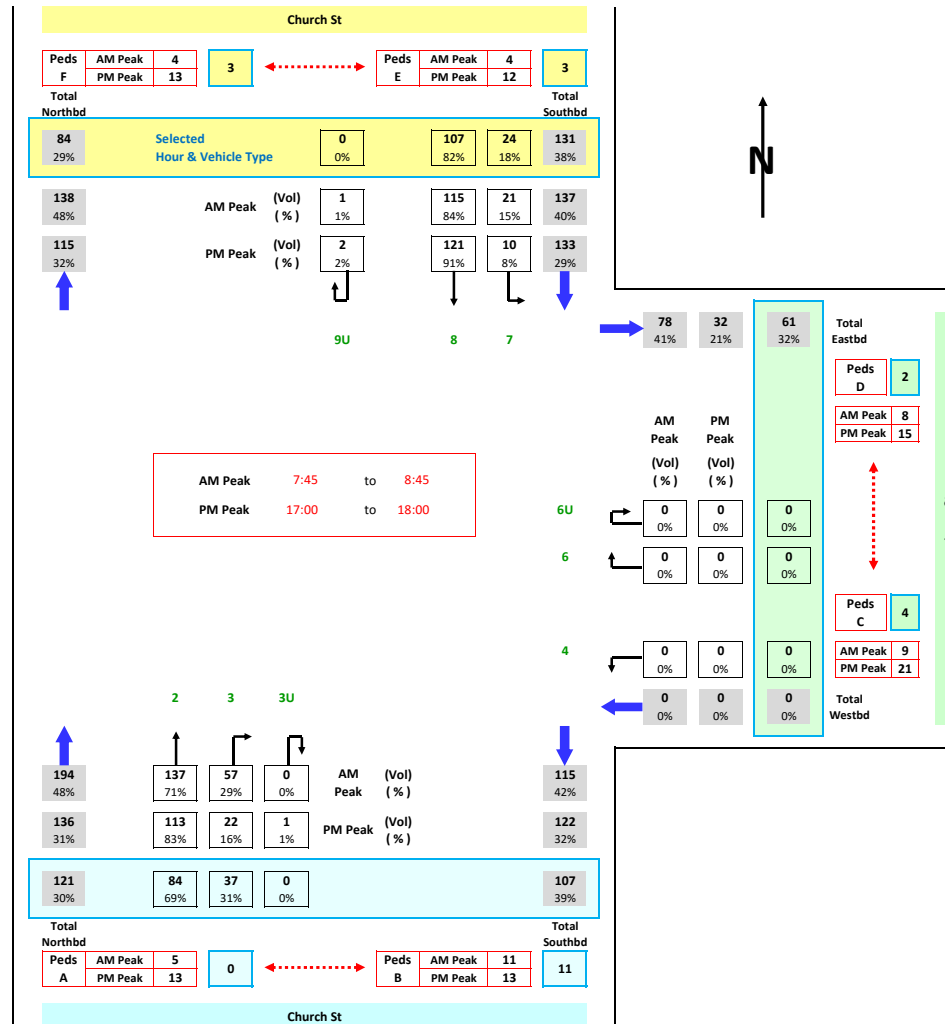
Survey Results

Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 1. Lucas St / Church St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

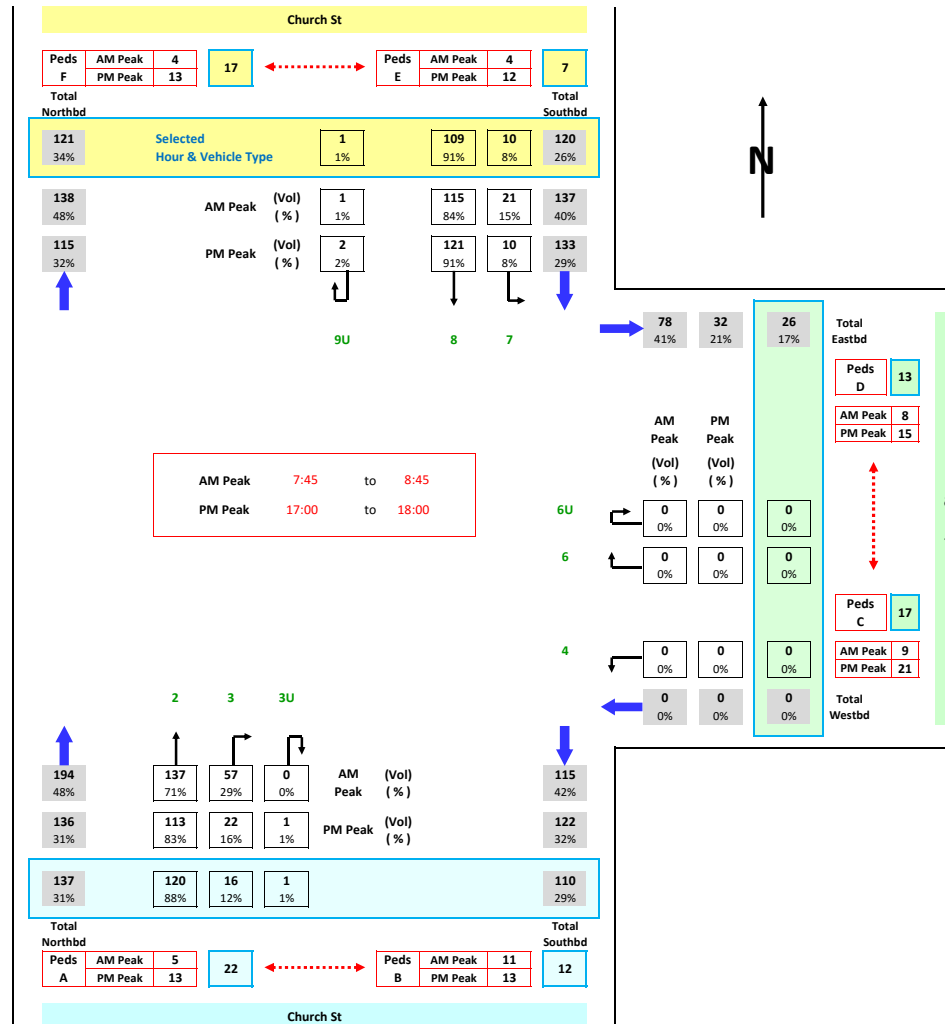


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 1. Lucas St / Church St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



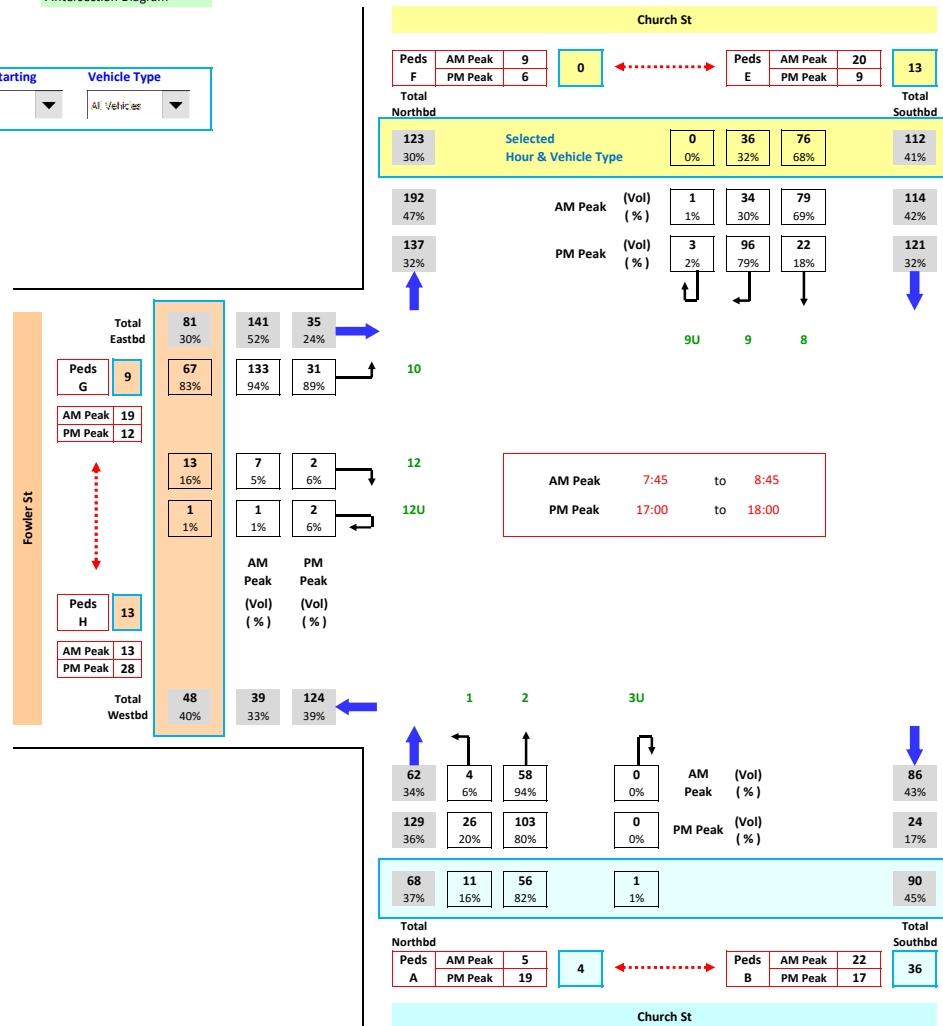
Hour Starting 16:30 Vehicle Type All Vehicles



Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 2. Fowler St / Church St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

Hour Starting 7:00 Vehicle Type All Vehicles

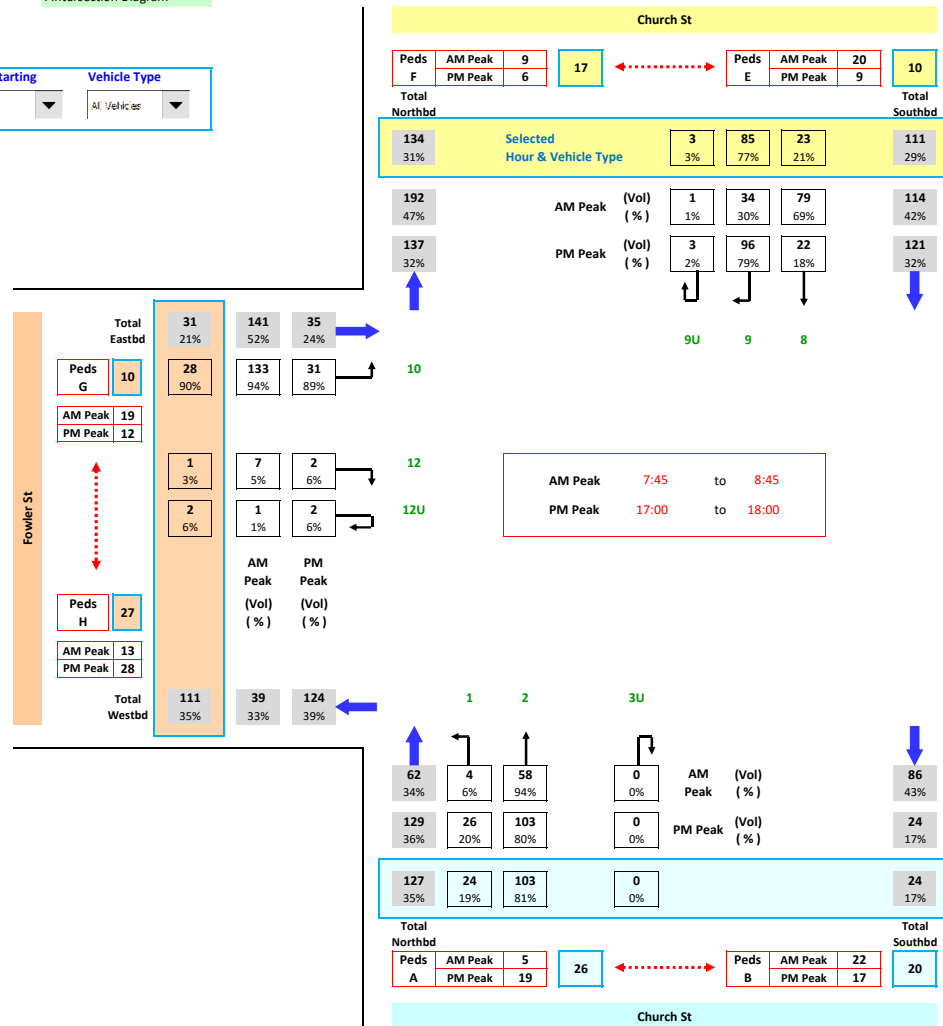


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 2. Fowler St / Church St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting: 16:30
Vehicle Type: All Vehicles

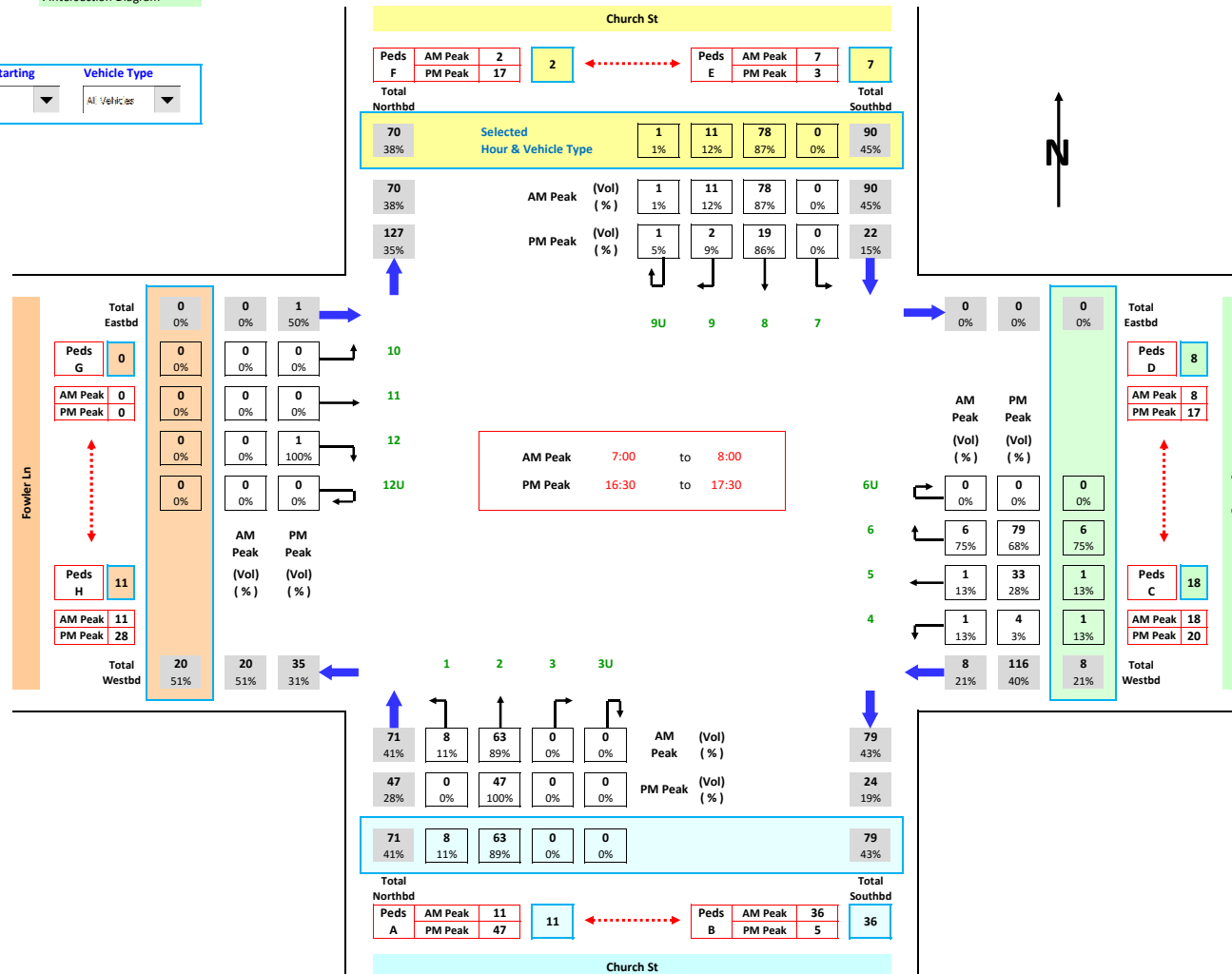


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 3. Church St / Grose St / Fowler Ln

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

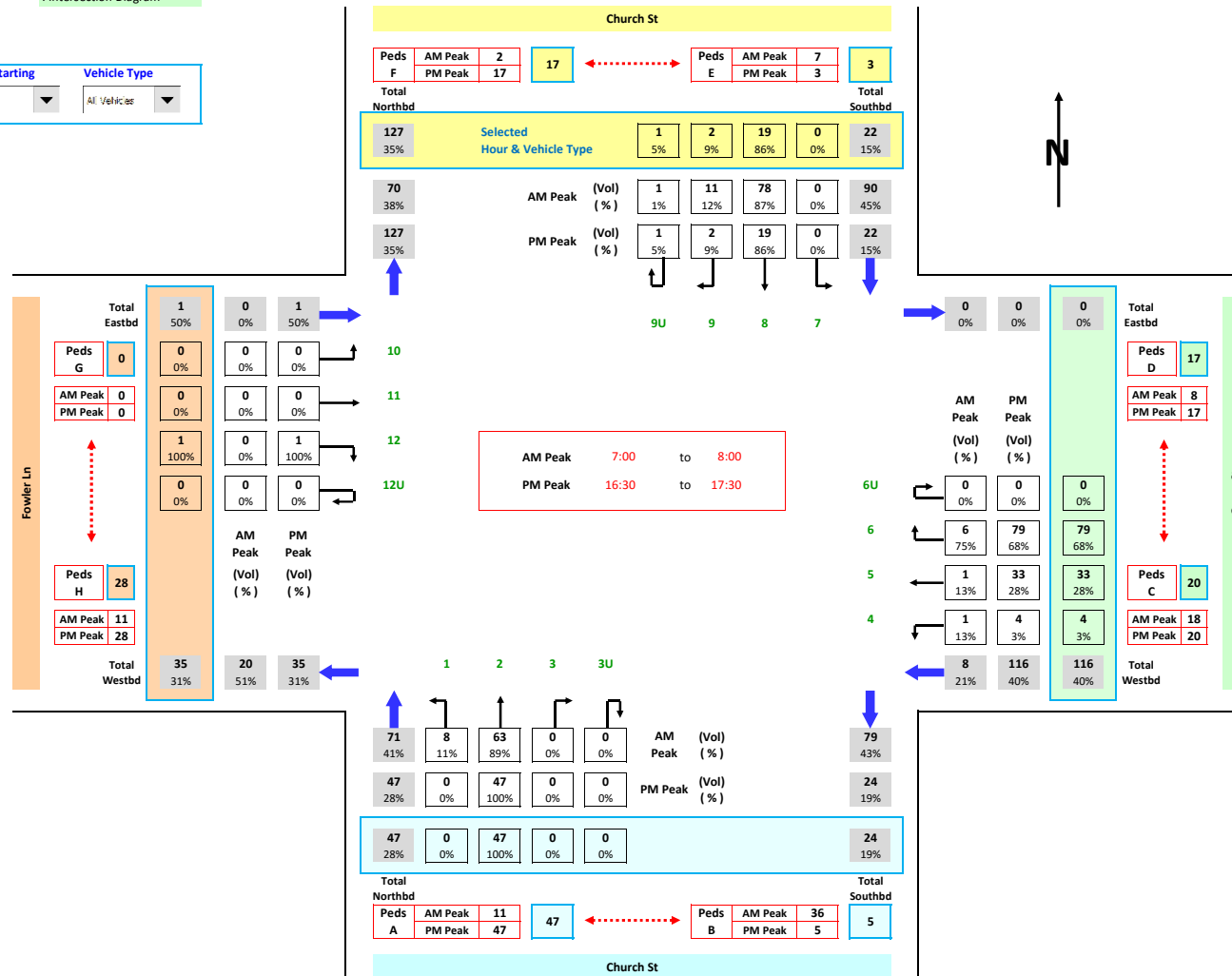


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 3. Church St / Grose St / Fowler Ln

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting: 16:30
Vehicle Type: All Vehicles

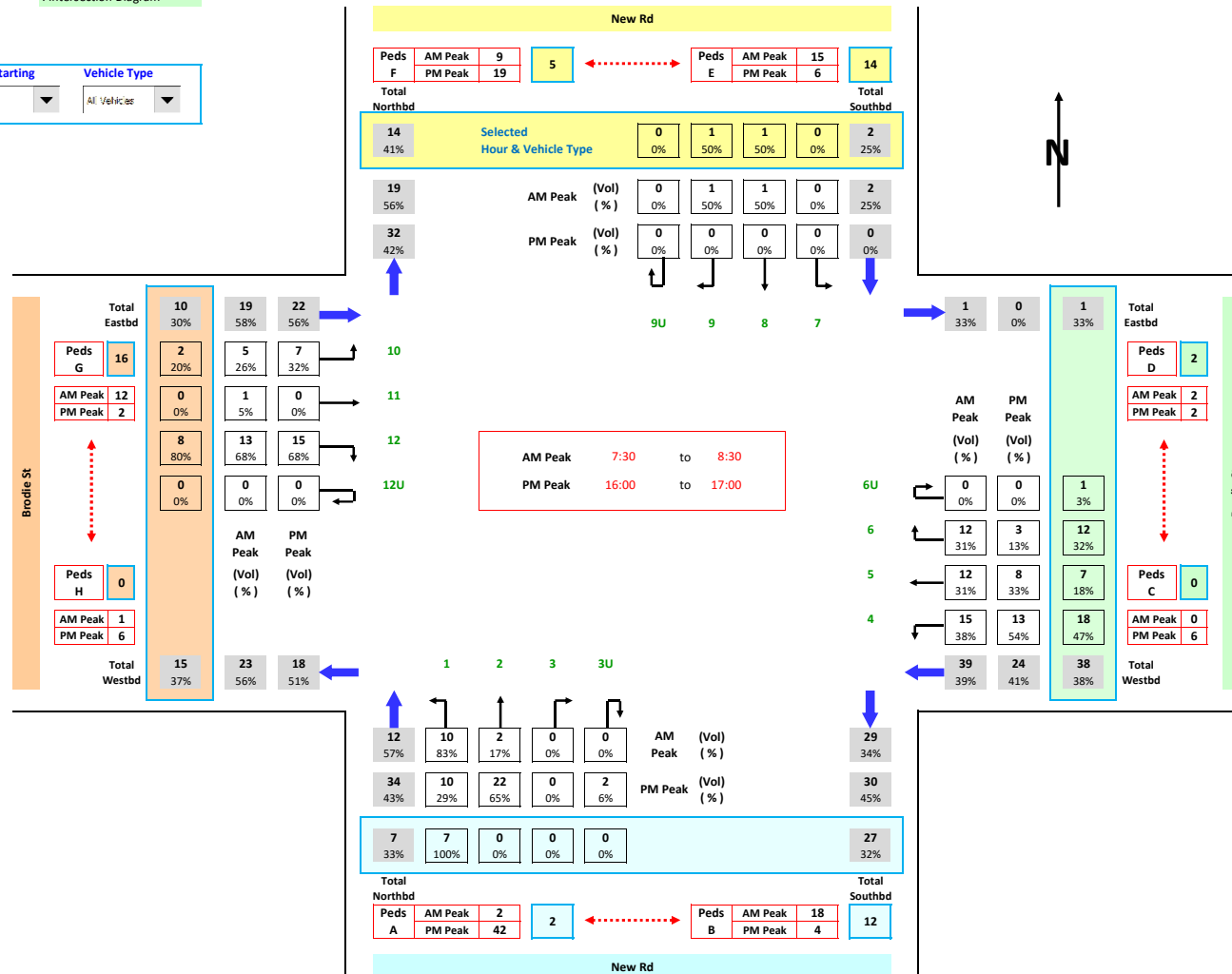


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 4. RPA Internal Rd (Brodie St / New Rd) just sth of Lucas St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

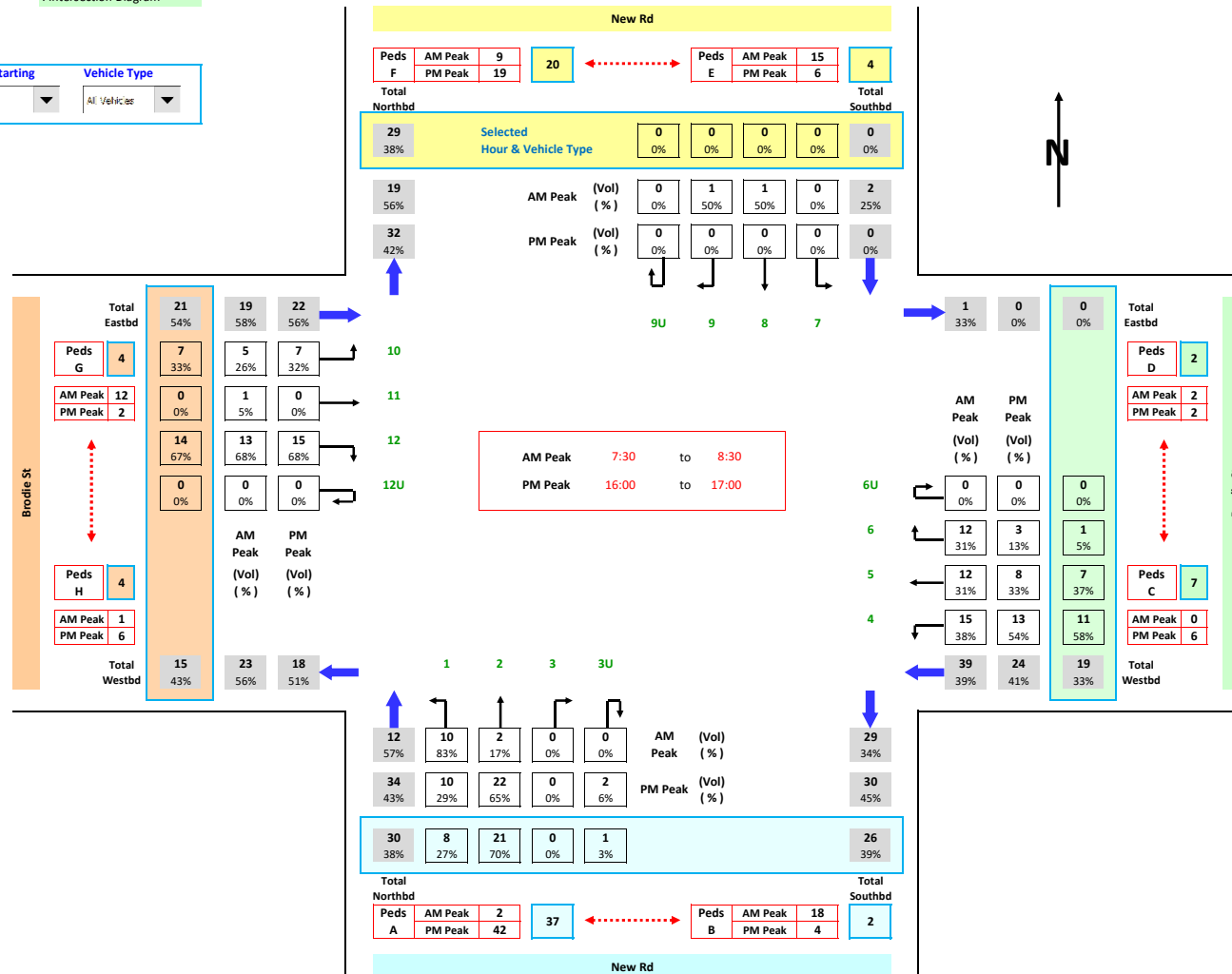


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 4. RPA Internal Rd (Brodie St / New Rd) just sth of Lucas St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



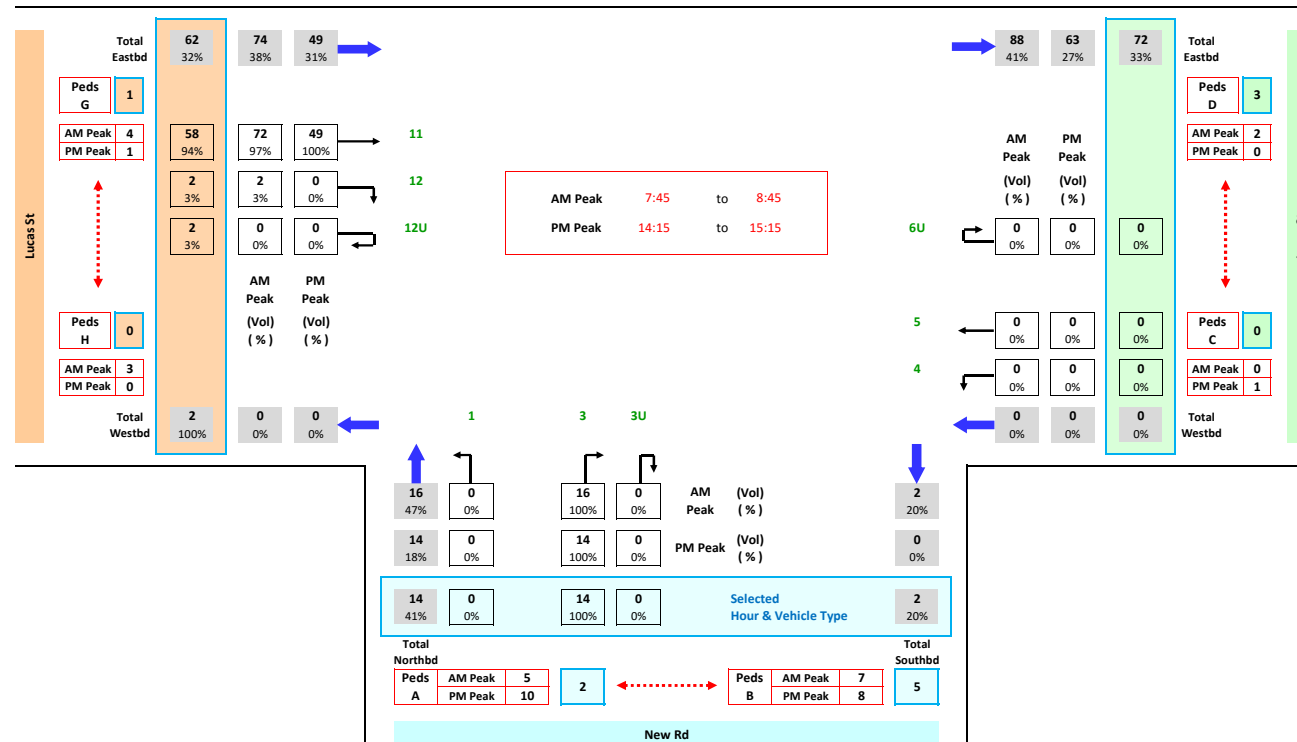
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Vehicle Type All Vehicles



Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
 : Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

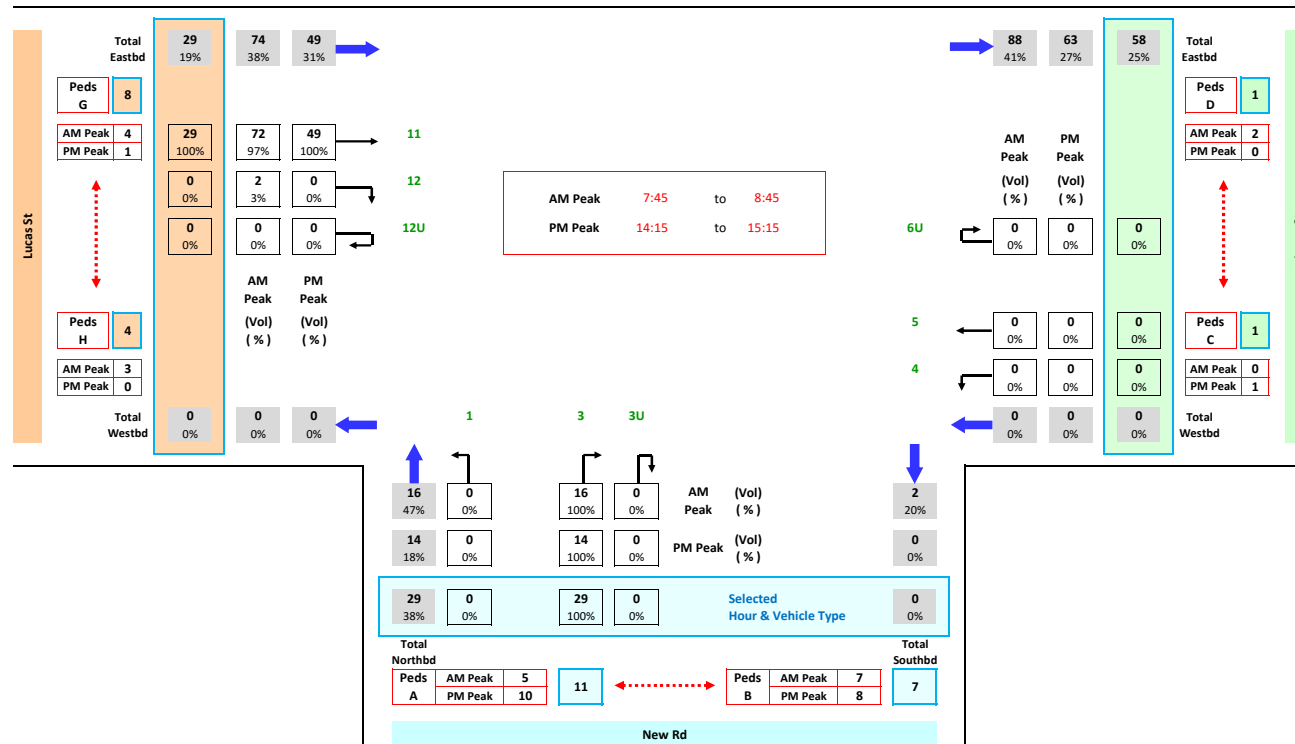


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 5. Lucas St / RPA Access (New Rd)

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting: 16:30
Vehicle Type: All Vehicles

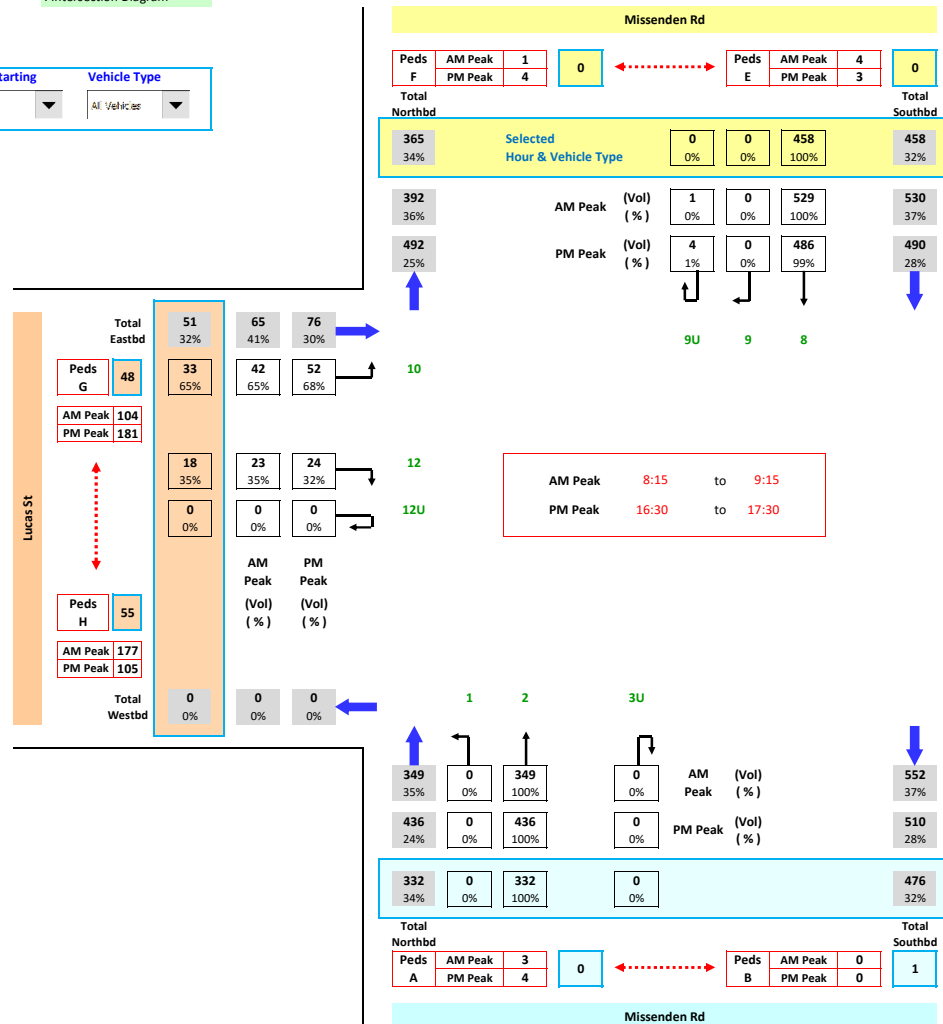


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 6. Lucas St / Missenden Rd

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

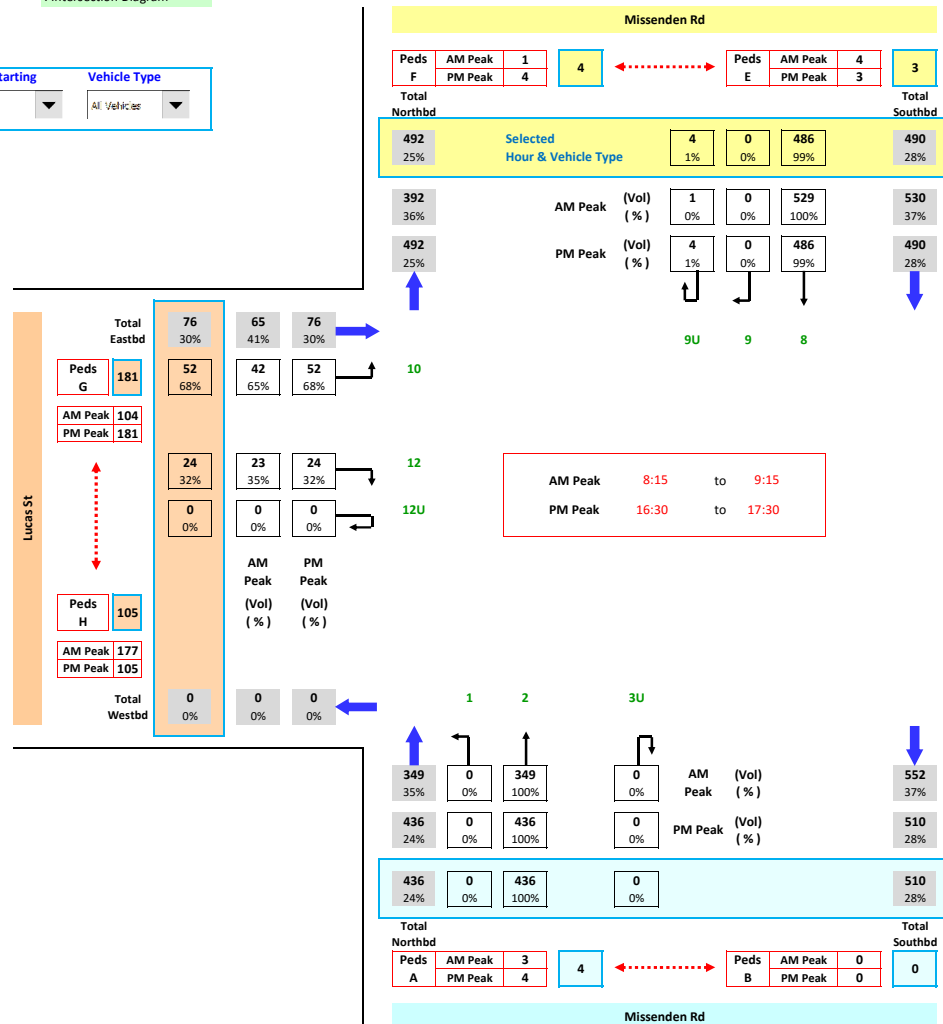


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 6. Lucas St / Missenden Rd

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting 16:30 Vehicle Type All Vehicles

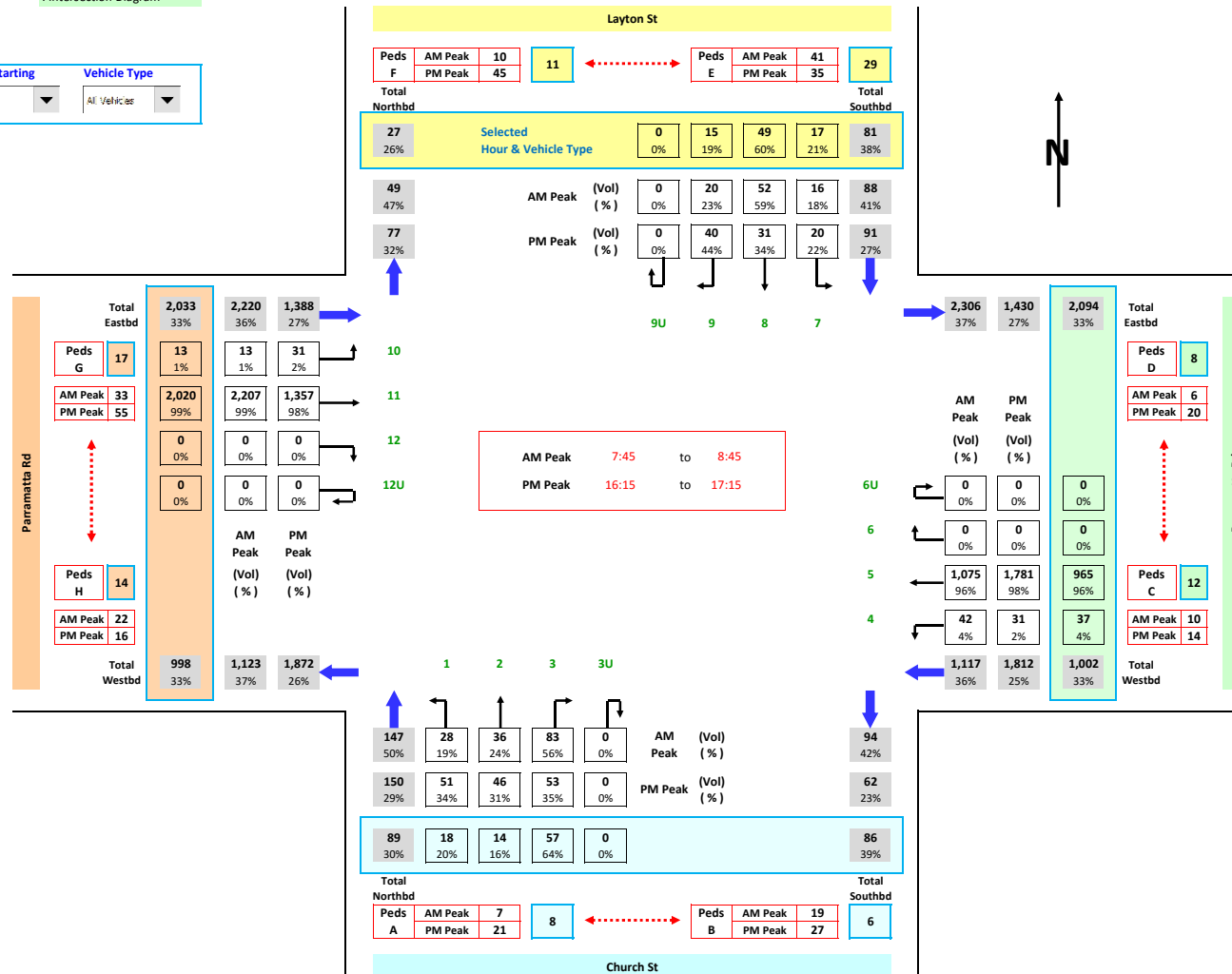


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 7. Parramatta Rd / Church St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

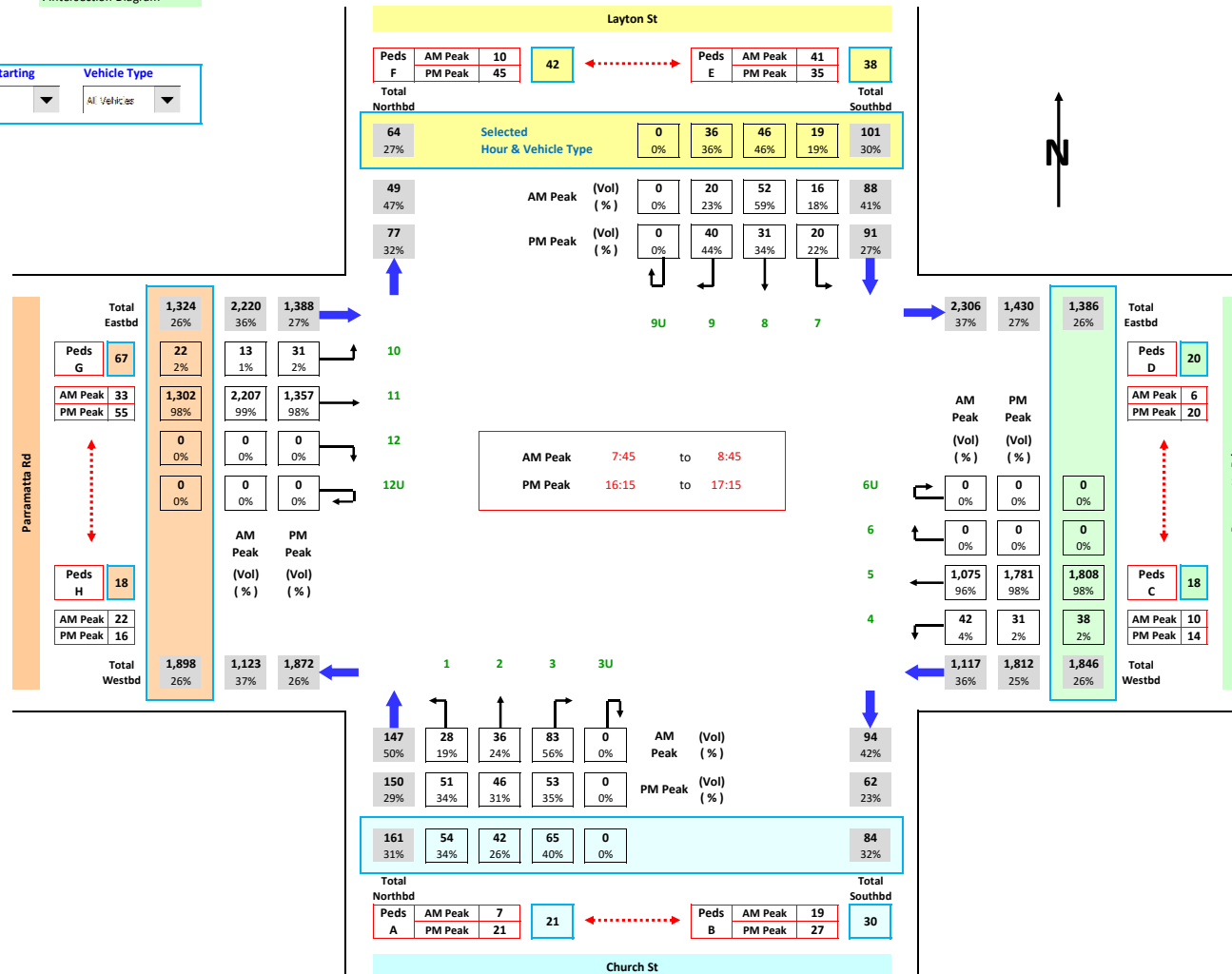


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 7. Parramatta Rd / Church St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting 16:30
Vehicle Type All Vehicles

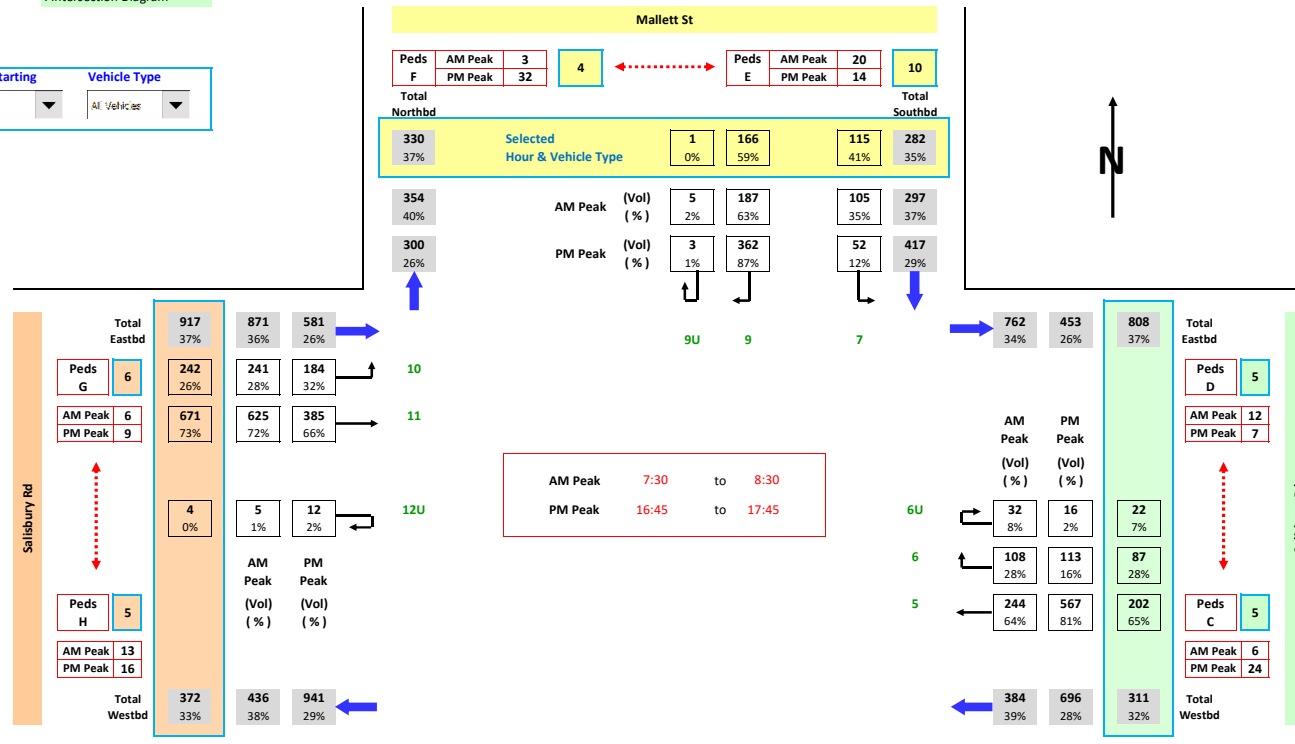


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 8. Salisbury Rd / Mallett St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

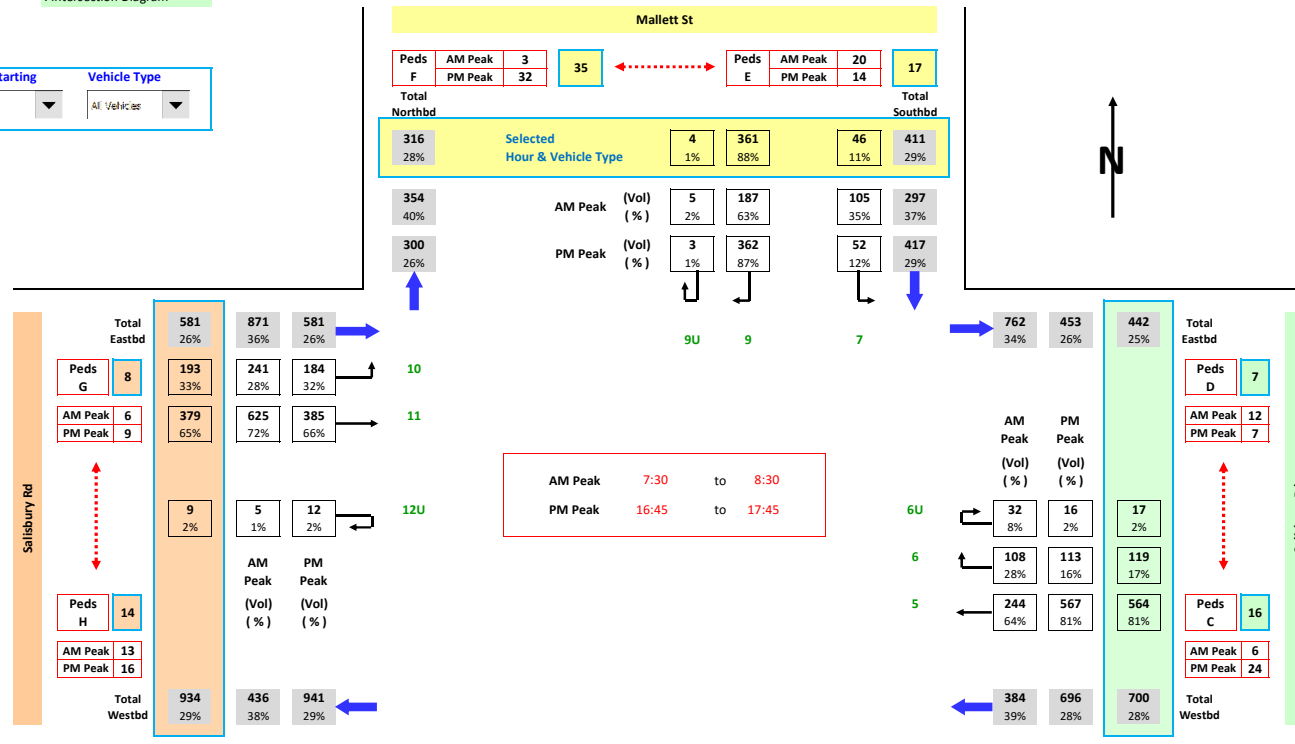


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 8. Salisbury Rd / Mallett St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting 16:30 Vehicle Type All Vehicles

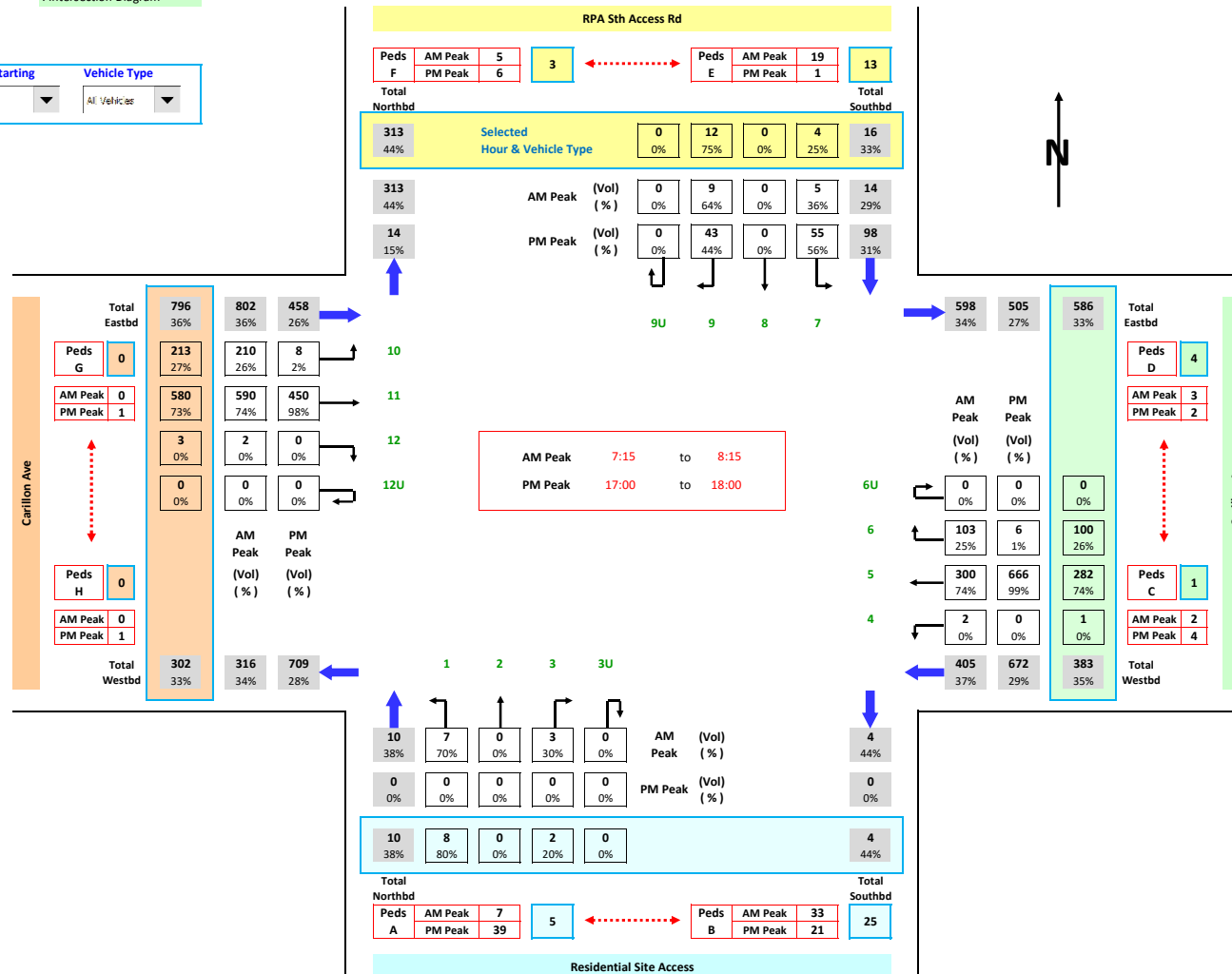


Job No. : N2252
 Client : GTA
 Suburb : Camperdown
 Location : 9. Carillon Ave / RPA Sth Access Rd / residential site access

Day/Date : Tue, 15th March 2016
 Weather : Fine
 Description : Classified Intersection Count
 : Intersection Diagram



Hour Starting: 7:00
 Vehicle Type: All Vehicles

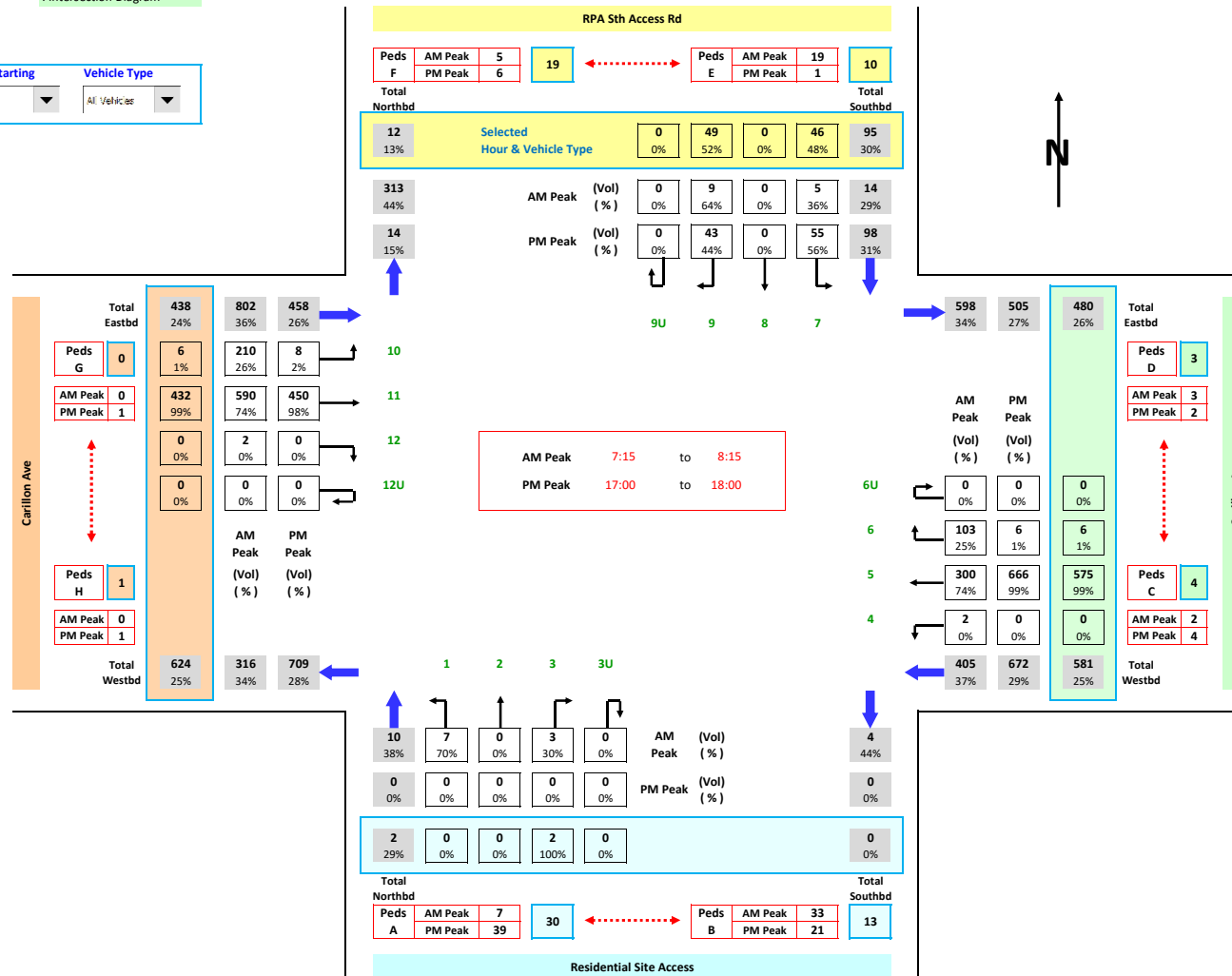


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 9. Carillon Ave / RPA Sth Access Rd / residential site access

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting 16:30 Vehicle Type All Vehicles

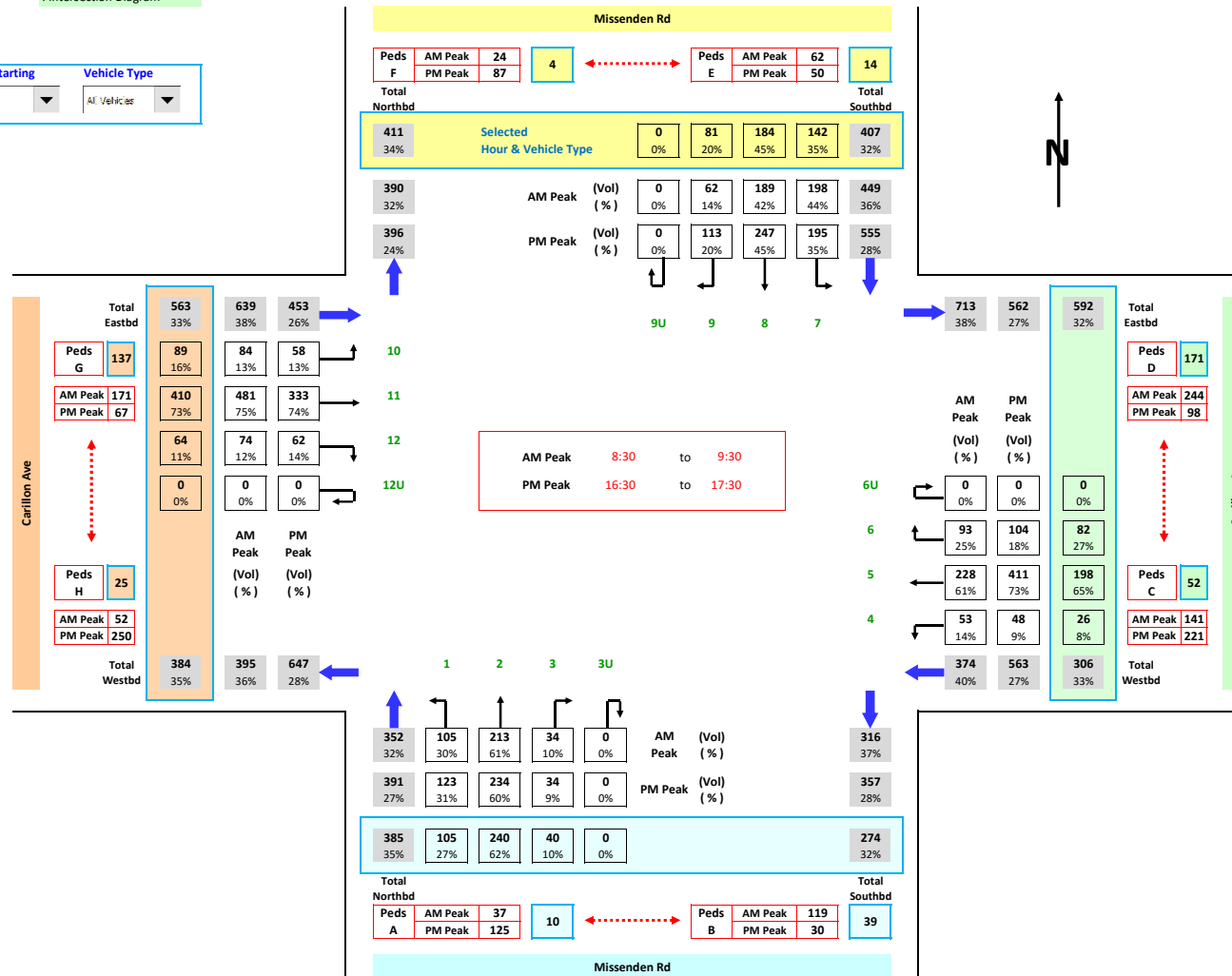


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 10. Carillon Ave / Missenden Rd

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

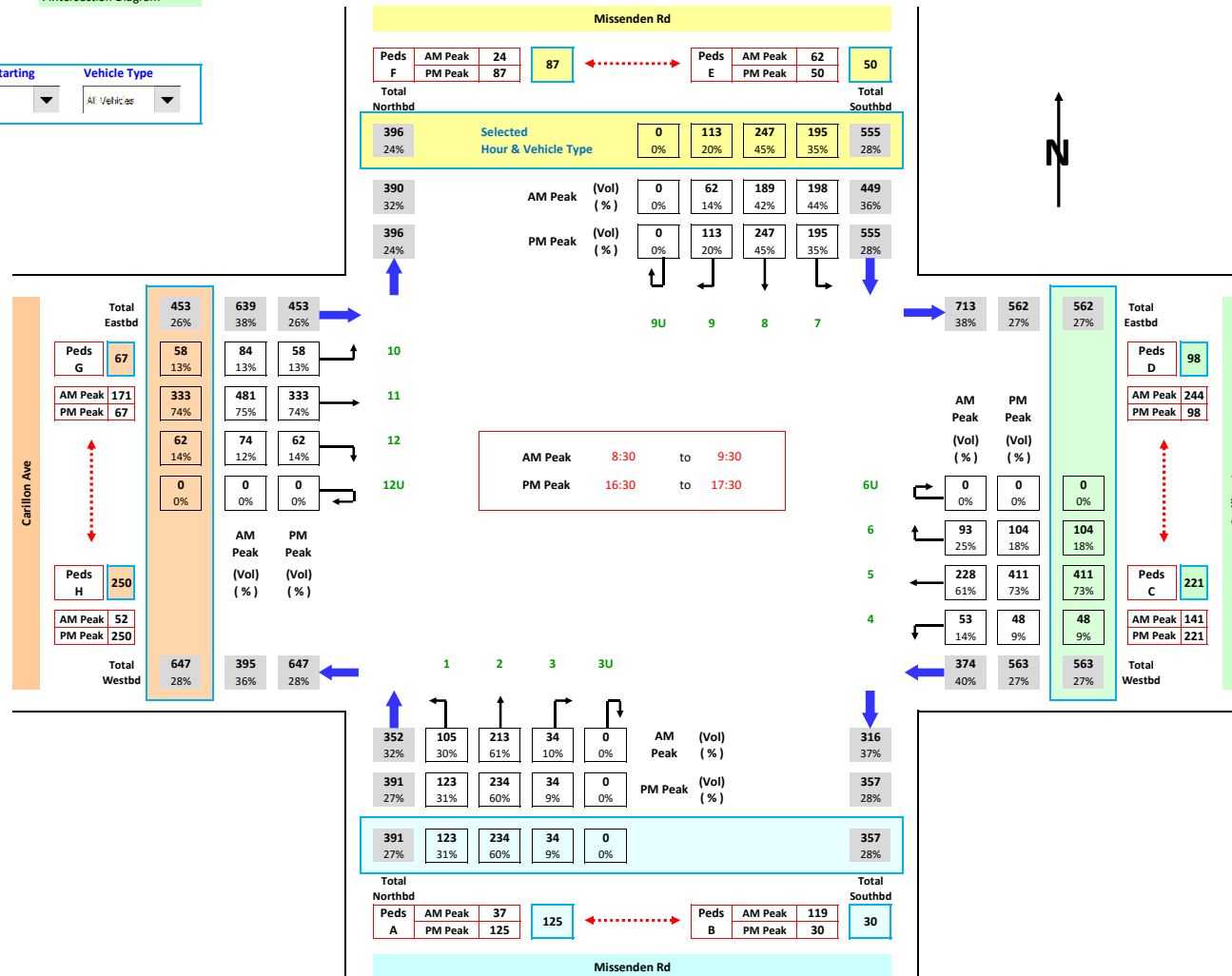


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 10. Carillon Ave / Missenden Rd

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



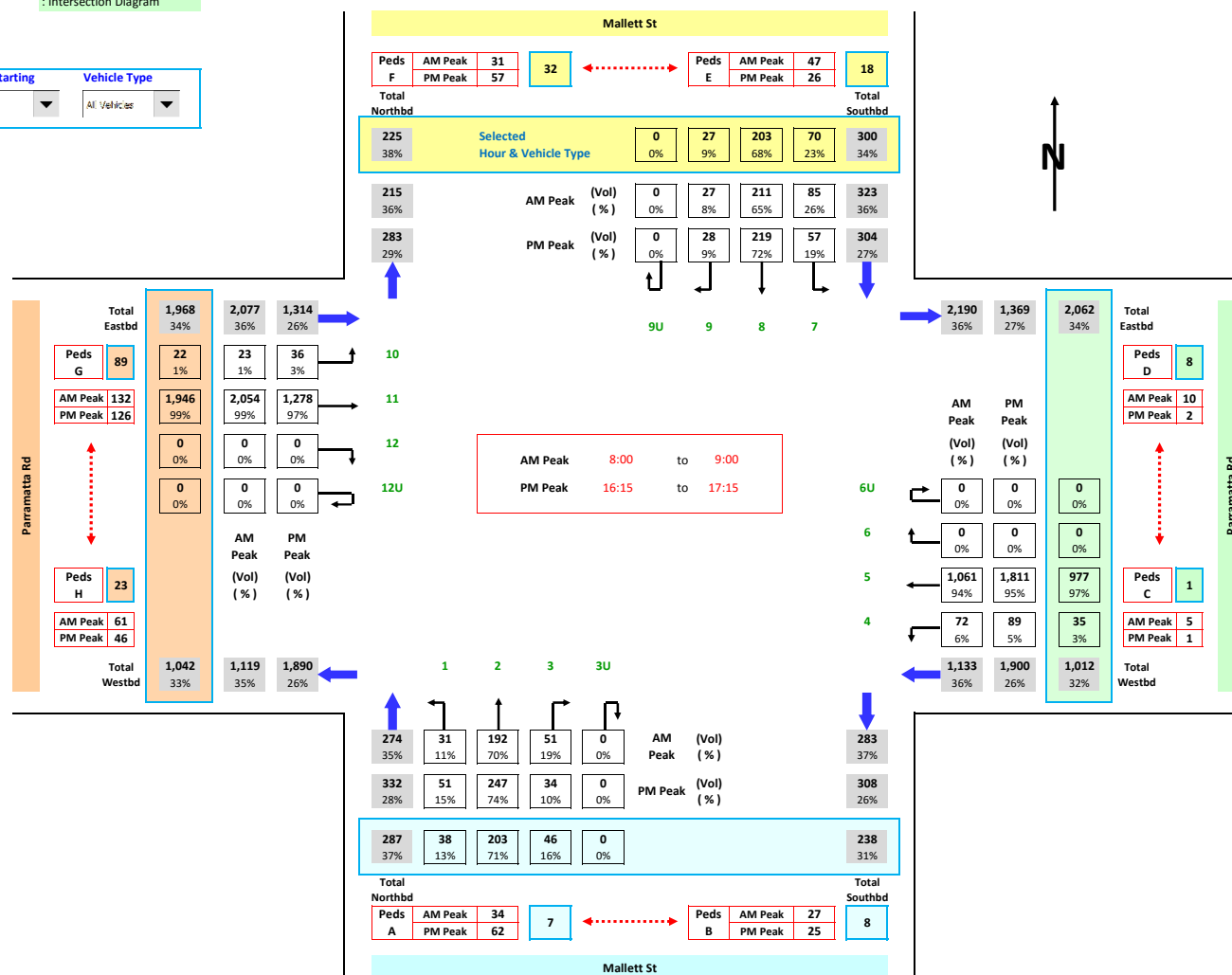
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Vehicle Type: All Vehicles



Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting: 7:00 Vehicle Type: All Vehicles

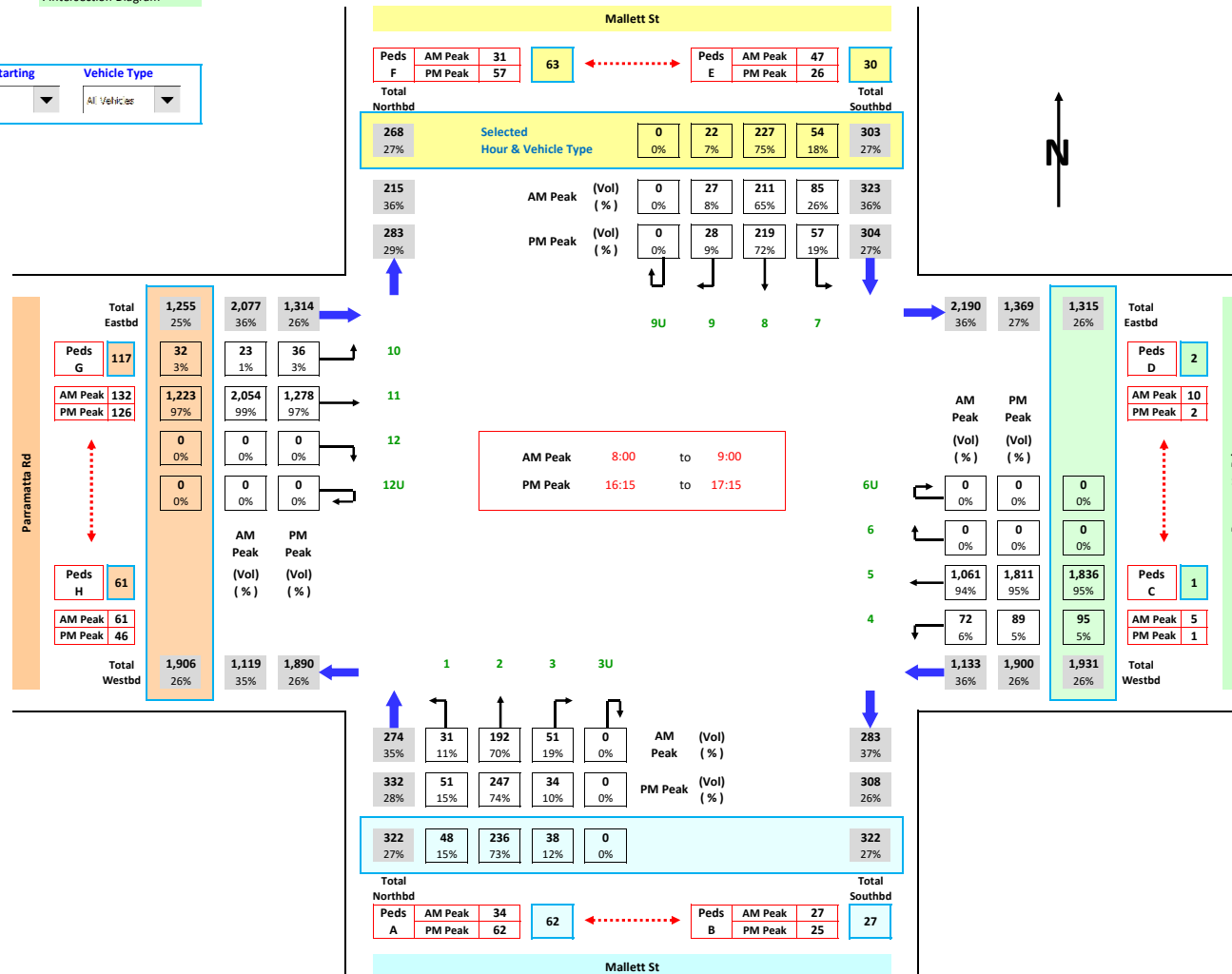


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 11. Parramatta Rd / Mallett St

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



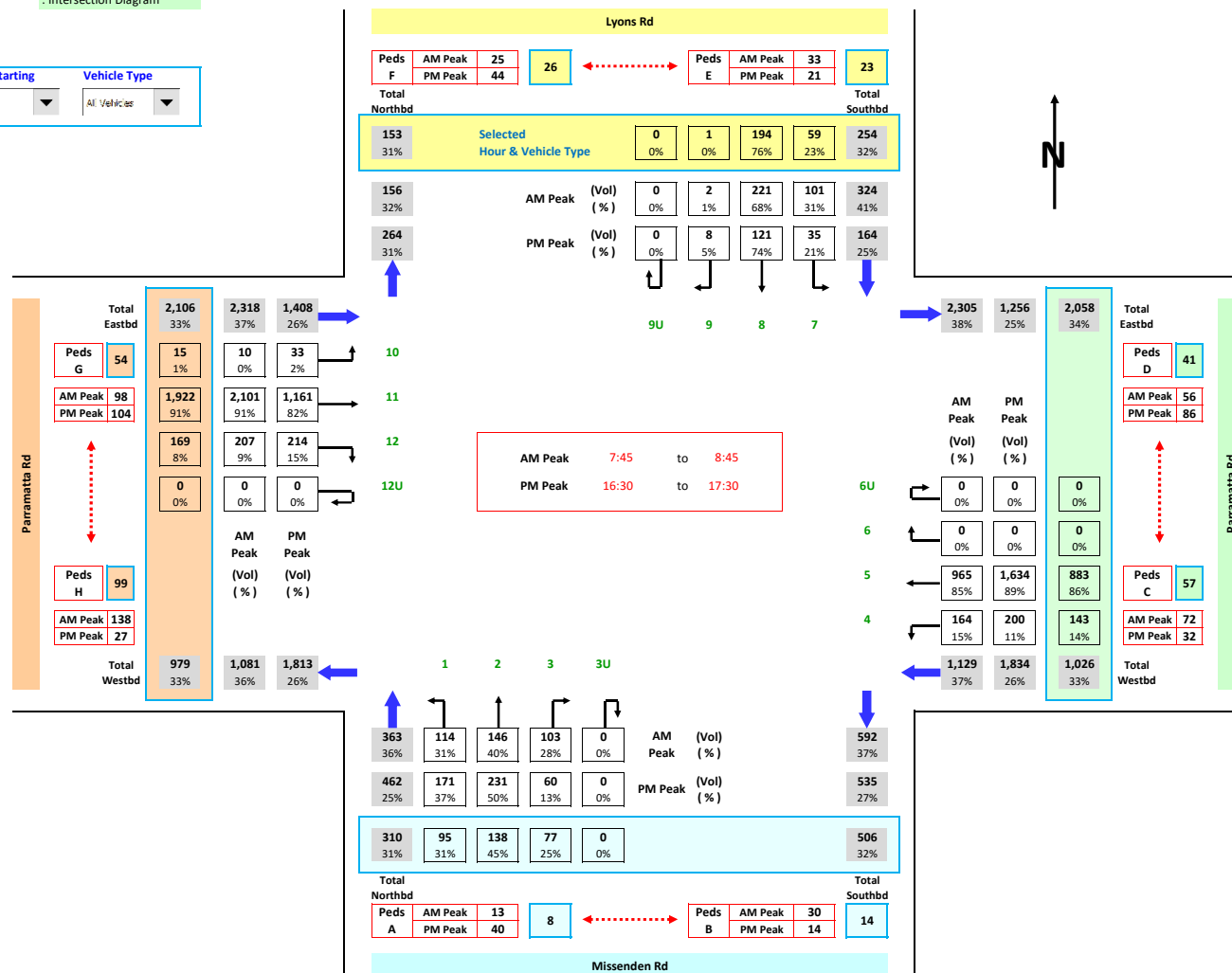
Hour Starting 16:30 Vehicle Type All Vehicles



Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting: 7:00 Vehicle Type: All Vehicles

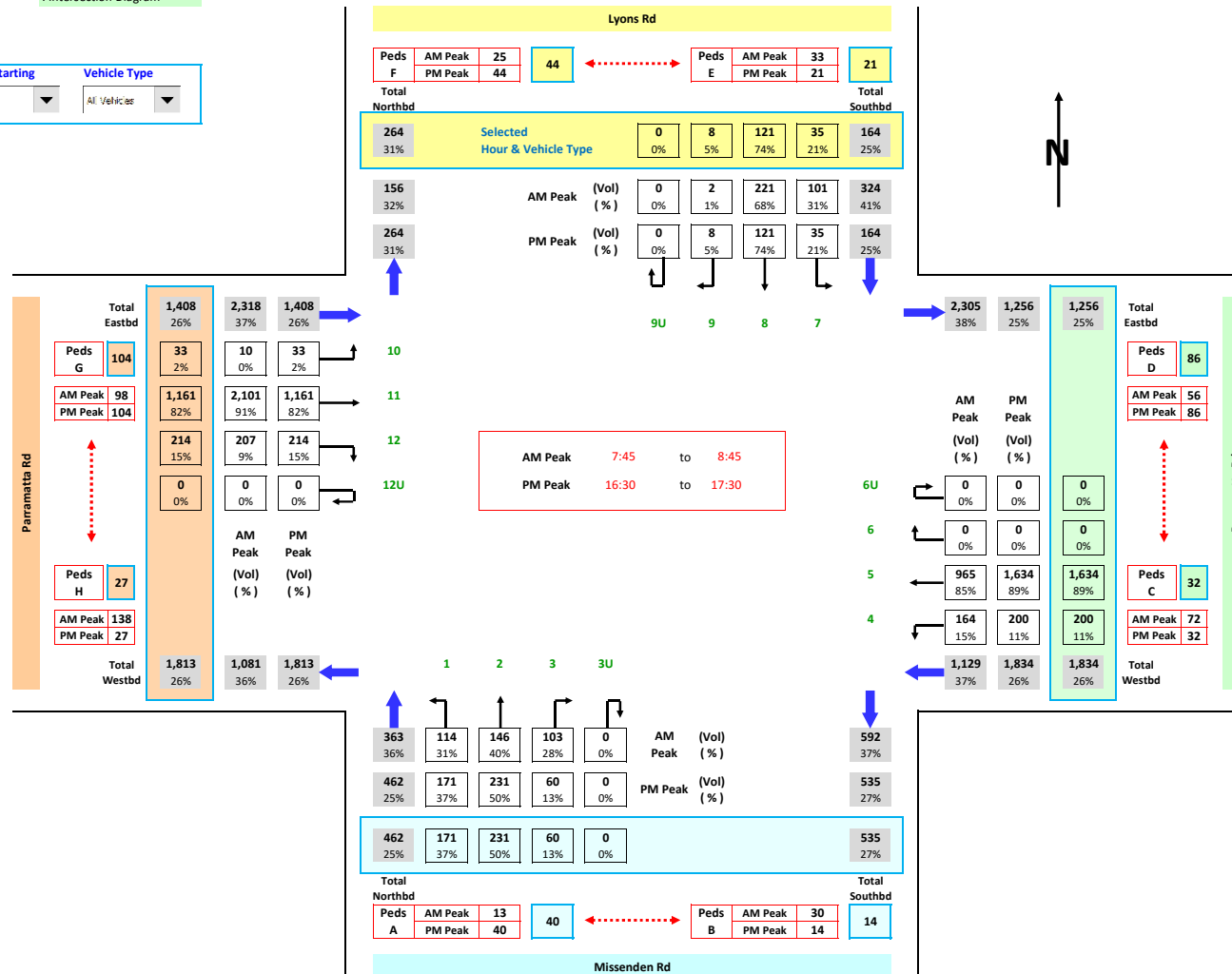


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 12. Parramatta Rd / Missenden Rd / Lyons Rd

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting: 16:30
Vehicle Type: All Vehicles

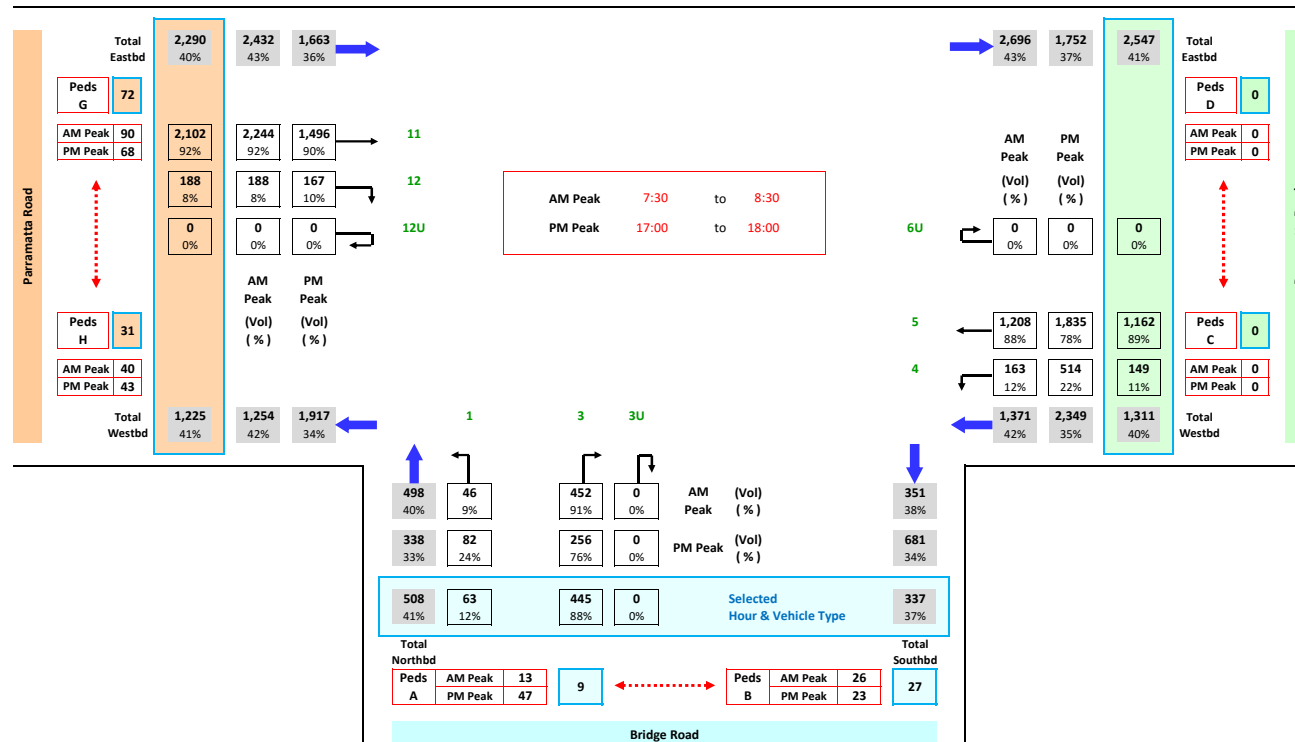


Job No. : N2584
Client : GTA
Suburb : Camperdown
Location : 1. Parramatta Road / Bridge Road

Day/Date : Thu, 18th August 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

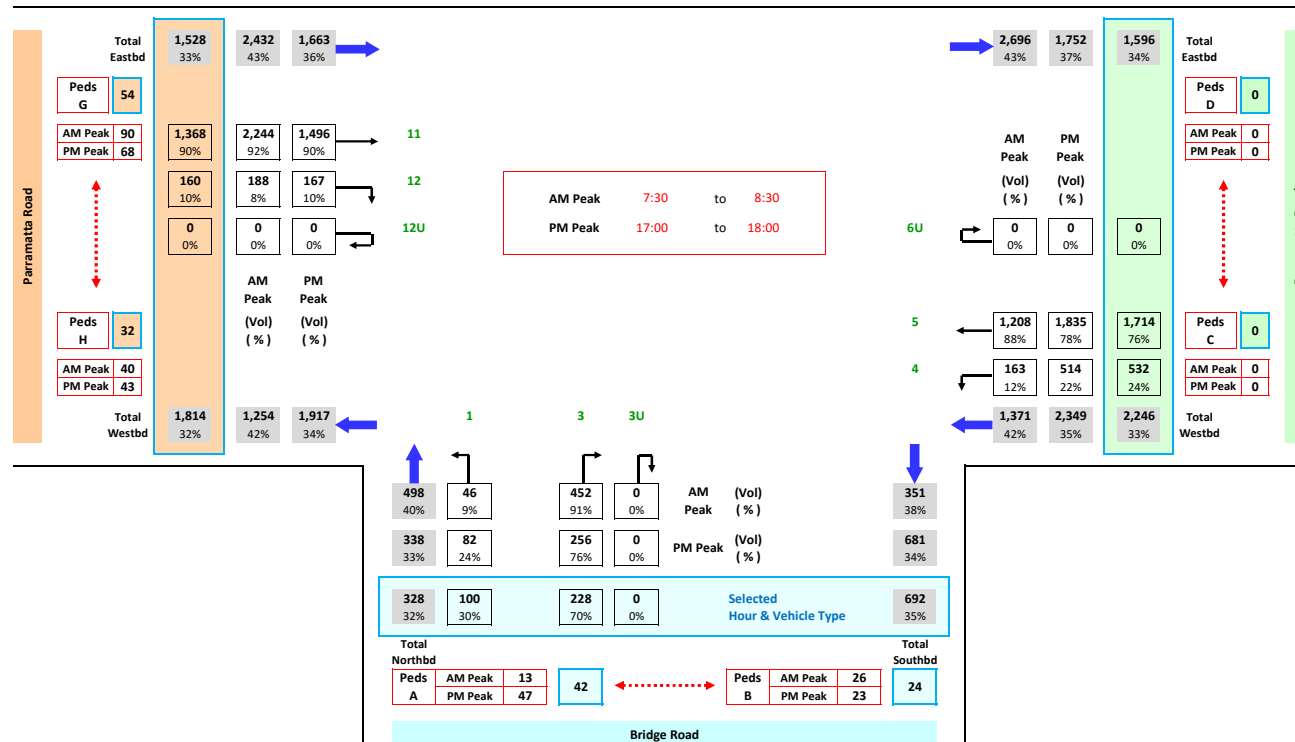


Job No. : N2584
Client : GTA
Suburb : Camperdown
Location : 1. Parramatta Road / Bridge Road

Day/Date : Thu, 18th August 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting: 16:30
Vehicle Type: All Vehicles

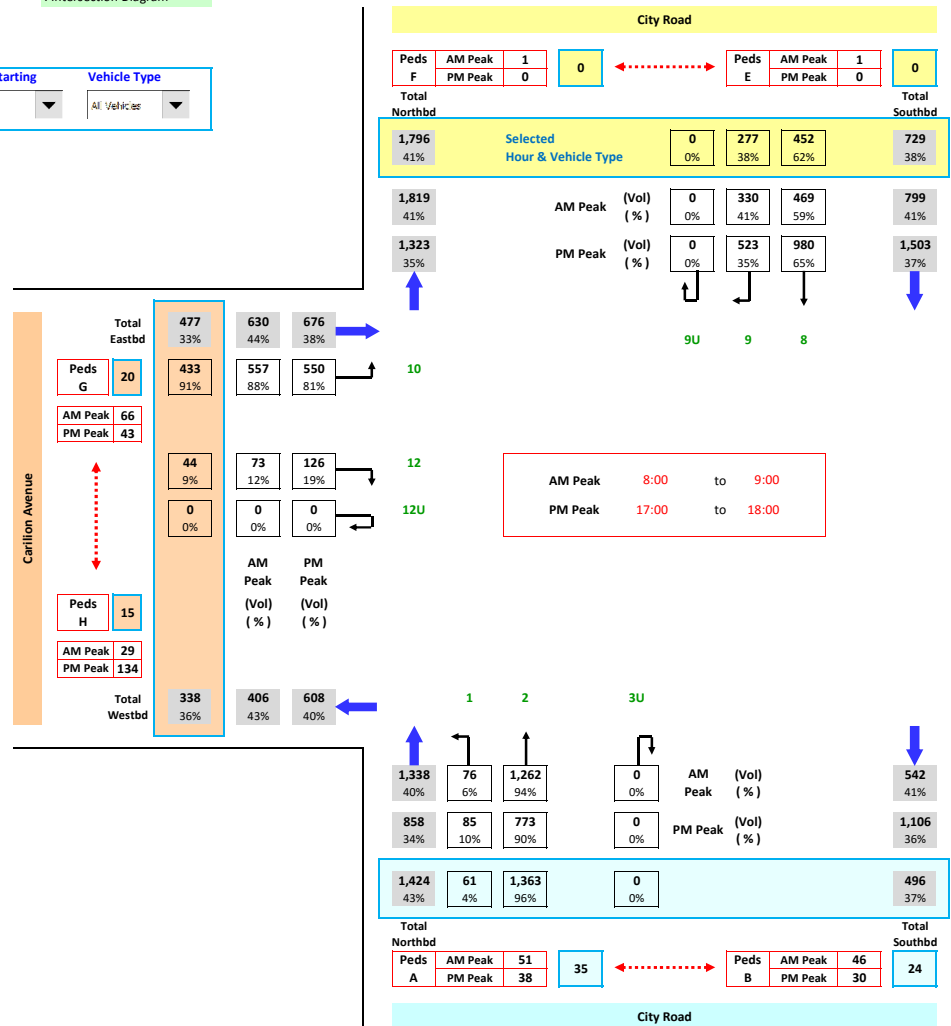


Job No. : N2584
Client : GTA
Suburb : Camperdown
Location : 2. City Road / Carillon Avenue

Day/Date : Thu, 18th August 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

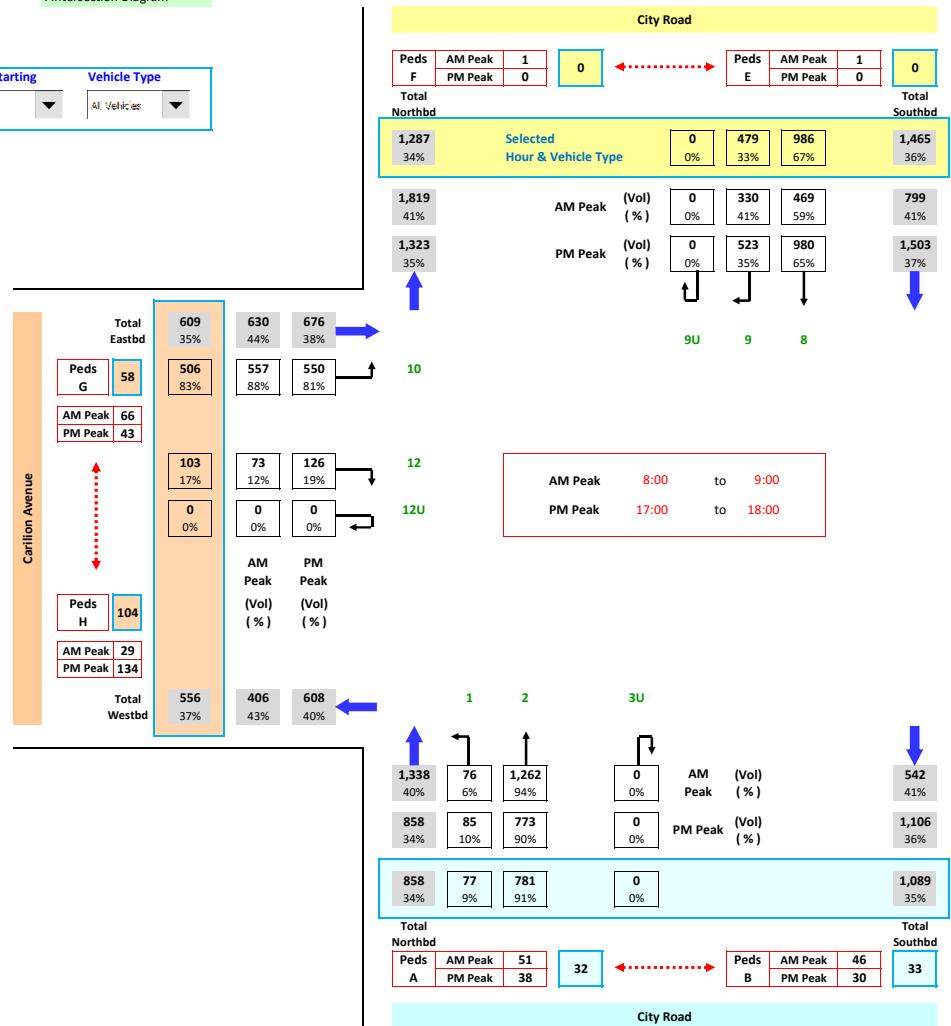


Job No. : N2584
Client : GTA
Suburb : Camperdown
Location : 2. City Road / Carillon Avenue

Day/Date : Thu, 18th August 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting 16:30 Vehicle Type All Vehicles

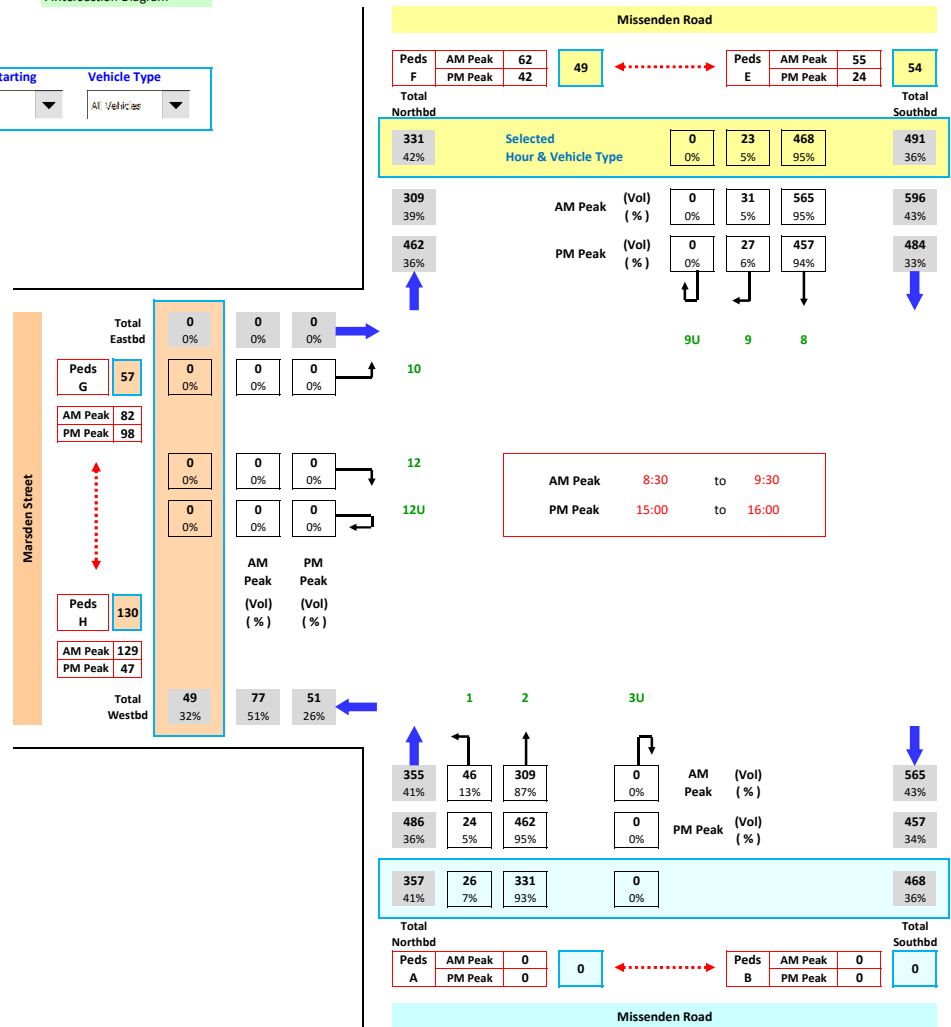


Job No. : N2584
Client : GTA
Suburb : Camperdown
Location : 3. Missenden Road / Marsden Street

Day/Date : Thu, 18th August 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

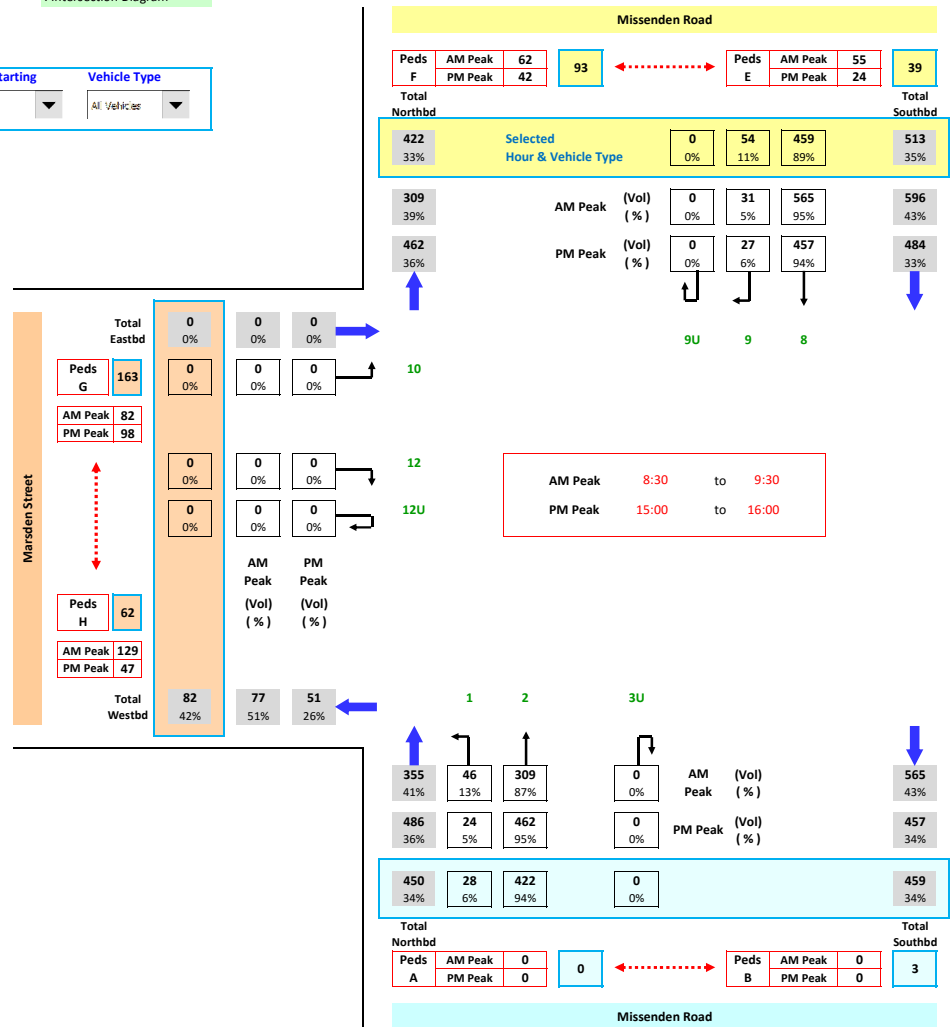


Job No. : N2584
Client : GTA
Suburb : Camperdown
Location : 3. Missenden Road / Marsden Street

Day/Date : Thu, 18th August 2016
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram



Hour Starting 16:30 Vehicle Type All Vehicles

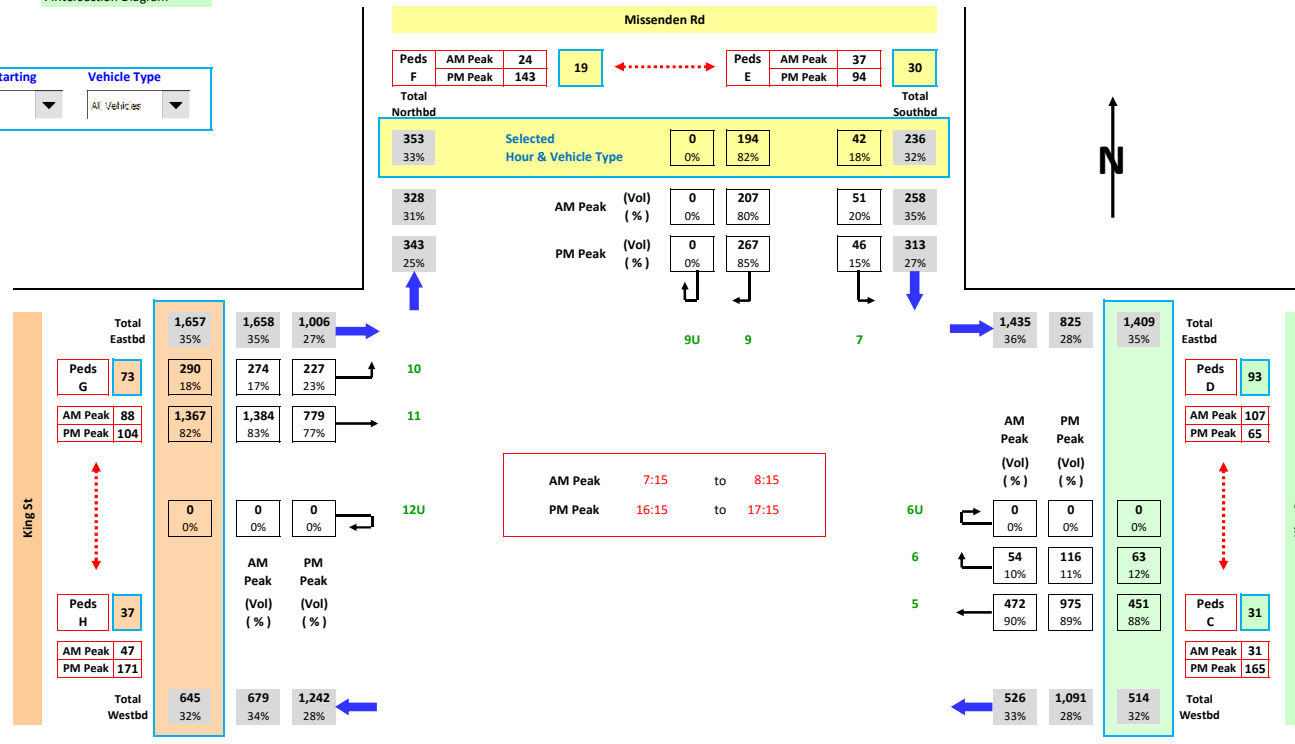


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 13. King St / Missenden Rd

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting: 7:00
Vehicle Type: All Vehicles

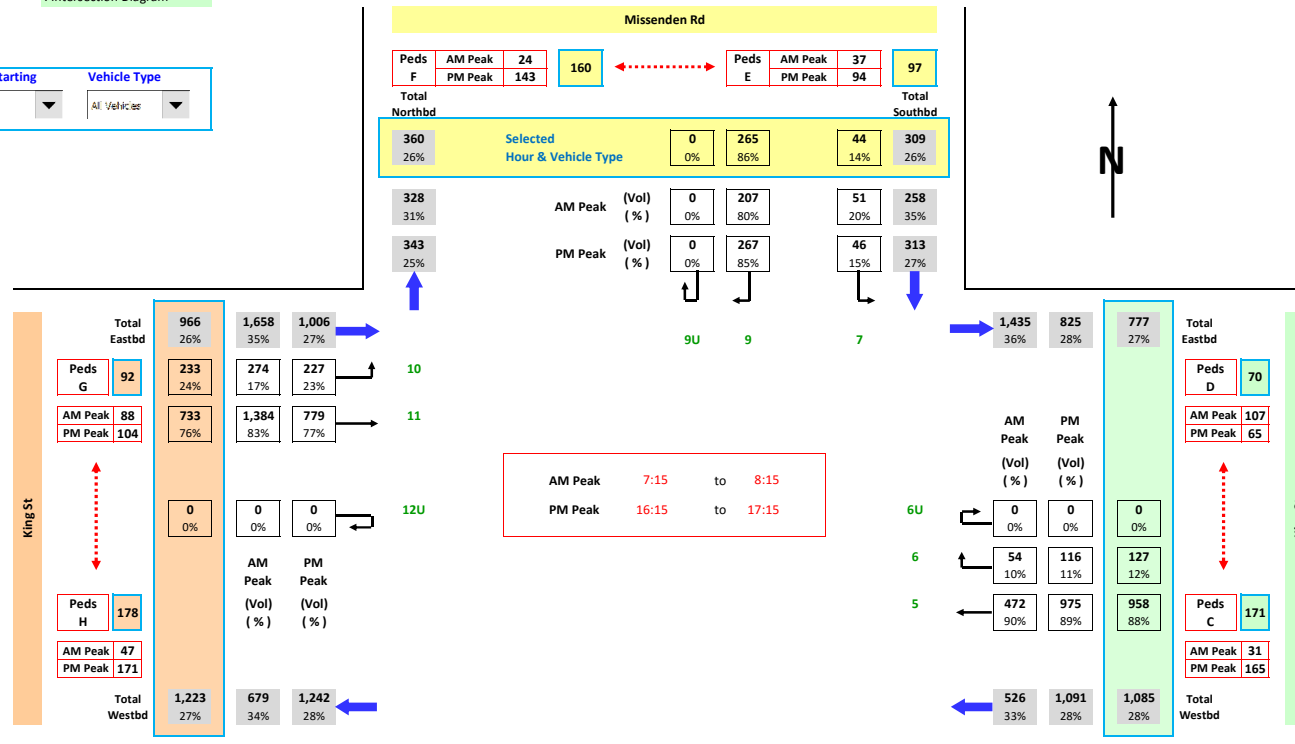


Job No. : N2252
Client : GTA
Suburb : Camperdown
Location : 13. King St / Missenden Rd

Day/Date : Tue, 15th March 2016
Weather : Fine
Description : Classified Intersection Count
Intersection Diagram



Hour Starting 16:30 Vehicle Type All Vehicles



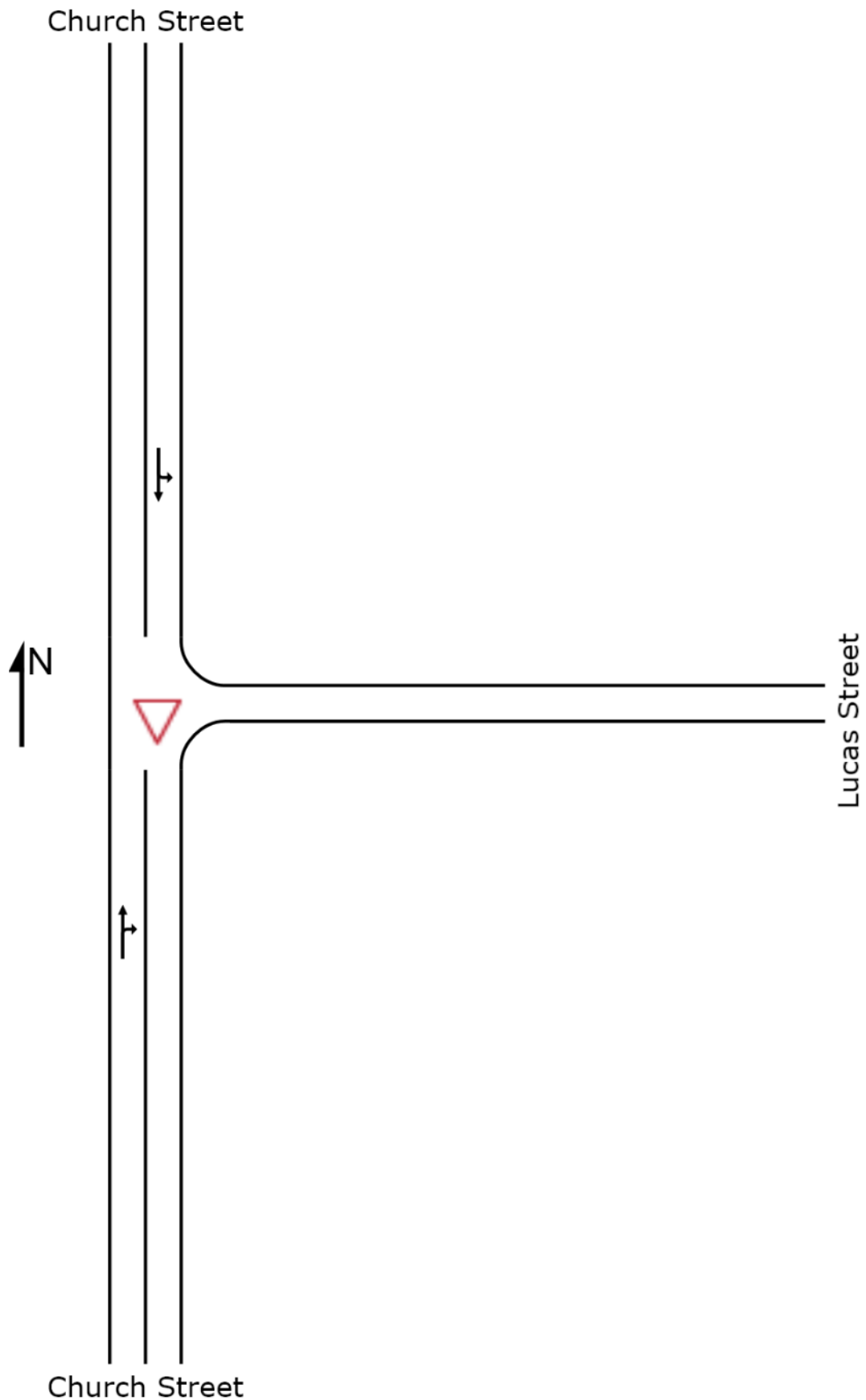
Appendix B

SIDRA INTERSECTION Results

SITE LAYOUT

▽ Site: AM - PRE - Church St and Lucas St

Three-way intersection with 2-lane major road (Stop control)
Giveaway / Yield (Two-Way)



MOVEMENT SUMMARY

▽ Site: AM - PRE - Church St and Lucas St

Three-way intersection with 2-lane major road (Stop control)
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total	HV	v/c	sec		Vehicles	Distance			
		veh/h	%				veh	m		per veh	km/h
South: Church Street											
11	T1	84	2.4	0.067	0.2	LOS A	0.2	1.5	0.15	0.19	57.7
12	R2	37	0.0	0.067	6.1	LOS A	0.2	1.5	0.15	0.19	55.5
Approach		121	1.7	0.067	2.0	NA	0.2	1.5	0.15	0.19	57.0
North: Church Street											
4	L2	24	0.0	0.068	5.5	LOS A	0.0	0.0	0.00	0.11	57.4
5	T1	107	1.9	0.068	0.0	LOS A	0.0	0.0	0.00	0.11	59.0
Approach		131	1.5	0.068	1.0	NA	0.0	0.0	0.00	0.11	58.7
All Vehicles		252	1.6	0.068	1.5	NA	0.2	1.5	0.07	0.15	57.9

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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Organisation: GTA CONSULTANTS | Processed: Wednesday, 31 August 2016 4:26:45 PM

Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Reports & Advice\Appendix A\160831_16S1251000_SITE 1_Lucas St & Church St(AM-POST).sip6

MOVEMENT SUMMARY

▽ Site: PM - PRE - Church St and Lucas St

Three-way intersection with 2-lane major road (Stop control)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Church Street											
11	T1	120	0.0	0.072	0.1	LOS A	0.1	0.7	0.06	0.08	59.1
12	R2	16	1.7	0.072	6.1	LOS A	0.1	0.7	0.06	0.08	56.6
Approach		136	0.2	0.072	0.8	NA	0.1	0.7	0.06	0.08	58.8
North: Church Street											
4	L2	10	0.0	0.062	5.5	LOS A	0.0	0.0	0.00	0.05	57.9
5	T1	109	0.9	0.062	0.0	LOS A	0.0	0.0	0.00	0.05	59.5
Approach		119	0.8	0.062	0.5	NA	0.0	0.0	0.00	0.05	59.4
All Vehicles		255	0.5	0.072	0.6	NA	0.1	0.7	0.03	0.06	59.1

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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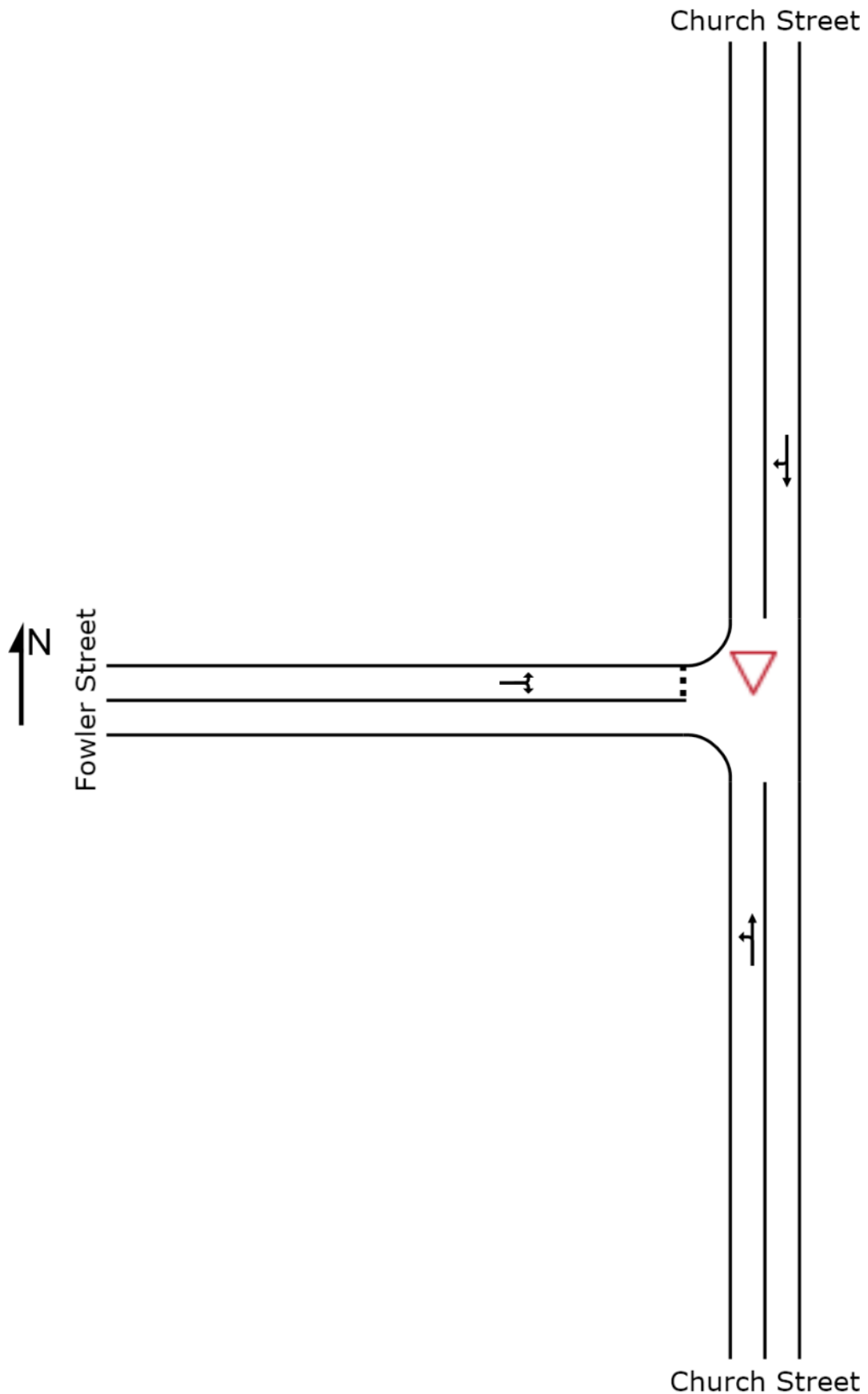
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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Reports & Advice\Appendix A\160831_16S1251000_SITE 1_Lucas St & Church St(AM-POST).sip6

SITE LAYOUT

Site: AM - PRE - Church St and Fowler St

Three-way intersection with 2-lane major road (Stop control)
Giveaway / Yield (Two-Way)



MOVEMENT SUMMARY

▽ Site: AM - PRE - Church St and Fowler St

Three-way intersection with 2-lane major road (Stop control)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Church Street											
4	L2	11	0.0	0.035	5.5	LOS A	0.0	0.0	0.00	0.10	57.5
5	T1	56	1.8	0.035	0.0	LOS A	0.0	0.0	0.00	0.10	59.1
Approach		67	1.5	0.035	0.9	NA	0.0	0.0	0.00	0.10	58.8
North: Church Street											
11	T1	76	0.0	0.062	0.1	LOS A	0.2	1.5	0.11	0.19	58.0
12	R2	36	5.6	0.062	5.7	LOS A	0.2	1.5	0.11	0.19	55.6
Approach		112	1.8	0.062	1.9	NA	0.2	1.5	0.11	0.19	57.2
West: Fowler Street											
1	L2	67	1.5	0.055	5.7	LOS A	0.2	1.5	0.13	0.55	53.2
3	R2	13	7.7	0.055	6.2	LOS A	0.2	1.5	0.13	0.55	52.3
Approach		80	2.5	0.055	5.8	LOS A	0.2	1.5	0.13	0.55	53.0
All Vehicles		259	1.9	0.062	2.9	NA	0.2	1.5	0.09	0.28	56.2

Level of Service (LOS) Method: Delay (RTA NSW).
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.

MOVEMENT SUMMARY

▽ Site: PM - PRE - Church St and Fowler St

Three-way intersection with 2-lane major road (Stop control)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Church Street											
4	L2	24	0.0	0.066	5.5	LOS A	0.0	0.0	0.00	0.11	57.4
5	T1	103	1.0	0.066	0.0	LOS A	0.0	0.0	0.00	0.11	59.0
Approach		127	0.8	0.066	1.1	NA	0.0	0.0	0.00	0.11	58.7
North: Church Street											
11	T1	23	0.0	0.065	0.4	LOS A	0.3	2.2	0.24	0.45	55.3
12	R2	85	1.2	0.065	5.8	LOS A	0.3	2.2	0.24	0.45	53.3
Approach		108	0.9	0.065	4.7	NA	0.3	2.2	0.24	0.45	53.7
West: Fowler Street											
1	L2	28	0.0	0.020	5.8	LOS A	0.1	0.5	0.19	0.54	53.0
3	R2	1	0.0	0.020	6.2	LOS A	0.1	0.5	0.19	0.54	52.5
Approach		29	0.0	0.020	5.8	LOS A	0.1	0.5	0.19	0.54	53.0
All Vehicles		264	0.8	0.066	3.1	NA	0.3	2.2	0.12	0.30	55.9

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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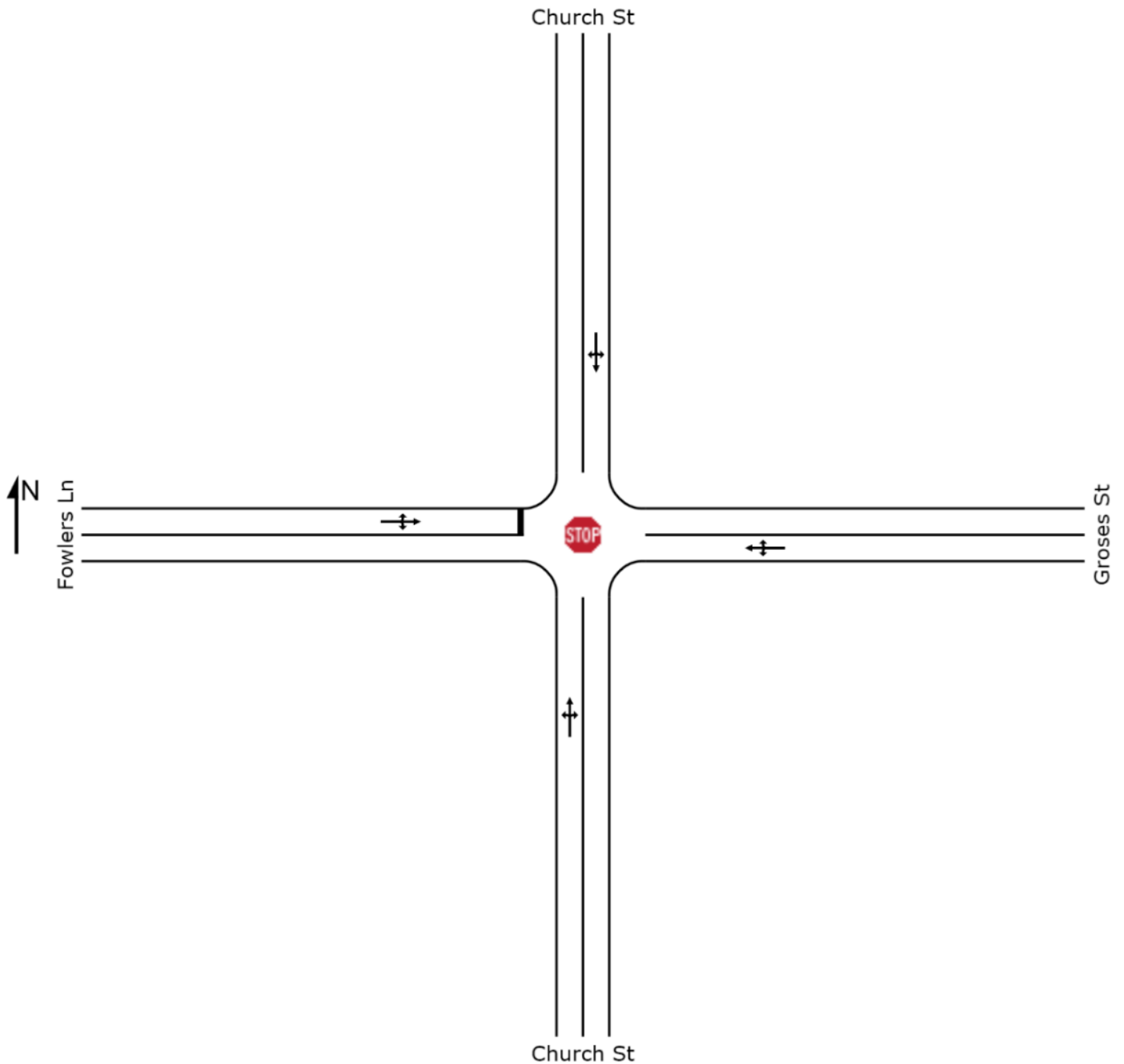
Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment\160831_16S1251000_SITE 2_Fowler St & Church St.sip6

SITE LAYOUT

 **Site: AM - PRE - Church St, Grose St and Fowler Ln**

Four-way intersection with 2-lane major road (Stop control)

Stop (Two-Way)



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MOVEMENT SUMMARY

 **Site: AM - PRE - Church St, Grose St and Fowler Ln**

Four-way intersection with 2-lane major road (Stop control)

Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Church St											
1	L2	8	0.0	0.059	5.5	LOS A	0.3	2.0	0.01	0.07	57.7
2	T1	63	1.6	0.059	0.0	LOS A	0.3	2.0	0.01	0.07	59.3
3	R2	1	0.0	0.059	5.8	LOS A	0.3	2.0	0.01	0.07	57.1
Approach		72	1.4	0.059	0.7	NA	0.3	2.0	0.01	0.07	59.0
East: Grose St											
4	L2	1	100.0	0.007	6.7	LOS A	0.0	0.2	0.23	0.50	51.4
5	T1	1	0.0	0.007	0.5	LOS A	0.0	0.2	0.23	0.50	54.9
6	R2	6	0.0	0.007	6.0	LOS A	0.0	0.2	0.23	0.50	53.0
Approach		8	12.5	0.007	5.5	NA	0.0	0.2	0.23	0.50	53.0
North: Church St											
7	L2	1	0.0	0.049	5.8	LOS A	0.1	0.6	0.05	0.08	57.5
8	T1	78	1.3	0.049	0.0	LOS A	0.1	0.6	0.05	0.08	59.1
9	R2	11	0.0	0.049	5.7	LOS A	0.1	0.6	0.05	0.08	56.9
Approach		90	1.1	0.049	0.8	NA	0.1	0.6	0.05	0.08	58.8
West: Fowlers Ln											
10	L2	1	0.0	0.003	8.2	LOS A	0.0	0.1	0.23	0.88	51.7
11	T1	1	0.0	0.003	8.7	LOS A	0.0	0.1	0.23	0.88	51.4
12	R2	1	0.0	0.003	8.6	LOS A	0.0	0.1	0.23	0.88	51.2
Approach		3	0.0	0.003	8.5	LOS A	0.0	0.1	0.23	0.88	51.5
All Vehicles		173	1.7	0.059	1.1	NA	0.3	2.0	0.05	0.11	58.5

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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MOVEMENT SUMMARY

 **Site: PM - PRE - Church St, Grose St and Fowler Ln**

Four-way intersection with 2-lane major road (Stop control)

Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Church St											
1	L2	1	0.0	0.043	5.7	LOS A	0.2	1.4	0.13	0.06	57.6
2	T1	47	2.1	0.043	0.2	LOS A	0.2	1.4	0.13	0.06	59.2
3	R2	1	0.0	0.043	5.9	LOS A	0.2	1.4	0.13	0.06	57.0
Approach		49	2.0	0.043	0.4	NA	0.2	1.4	0.13	0.06	59.1
East: Grose St											
4	L2	4	0.0	0.089	5.6	LOS A	0.4	2.7	0.11	0.42	54.6
5	T1	33	0.0	0.089	0.1	LOS A	0.4	2.7	0.11	0.42	56.0
6	R2	79	0.0	0.089	5.7	LOS A	0.4	2.7	0.11	0.42	54.0
Approach		116	0.0	0.089	4.1	NA	0.4	2.7	0.11	0.42	54.6
North: Church St											
7	L2	1	0.0	0.012	5.7	LOS A	0.0	0.1	0.04	0.08	57.5
8	T1	19	0.0	0.012	0.0	LOS A	0.0	0.1	0.04	0.08	59.1
9	R2	2	0.0	0.012	5.7	LOS A	0.0	0.1	0.04	0.08	56.9
Approach		22	0.0	0.012	0.8	NA	0.0	0.1	0.04	0.08	58.8
West: Fowlers Ln											
10	L2	1	0.0	0.003	8.4	LOS A	0.0	0.1	0.25	0.86	51.8
11	T1	1	0.0	0.003	8.6	LOS A	0.0	0.1	0.25	0.86	51.6
12	R2	1	0.0	0.003	8.2	LOS A	0.0	0.1	0.25	0.86	51.3
Approach		3	0.0	0.003	8.4	LOS A	0.0	0.1	0.25	0.86	51.6
All Vehicles		190	0.5	0.089	2.9	NA	0.4	2.7	0.11	0.30	56.1

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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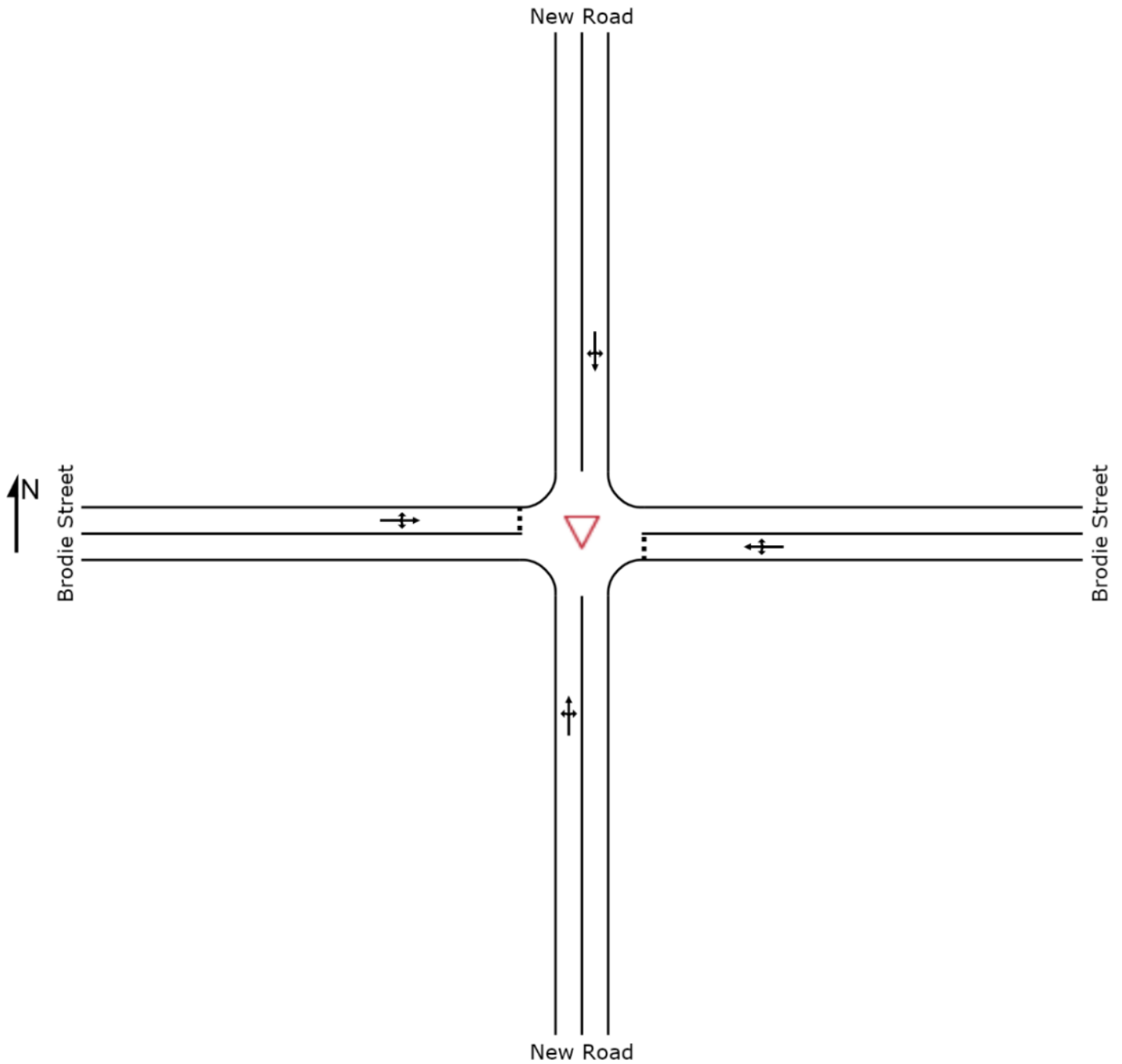
Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment\160831_16S1251000_SITE 3_Church St & Grose St & Fowler Ln.sip6

SITE LAYOUT

▽ Site: AM - PRE - New Rd and Brodie St

New Site

Giveway / Yield (Two-Way)



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Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
\160831sidra16S1251000_SITE 4_New Road & Brodie St.sip6

MOVEMENT SUMMARY

▽ Site: AM - PRE - New Rd and Brodie St

New Site

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: New Road											
1	L2	7	0.0	0.005	5.5	LOS A	0.0	0.0	0.01	0.52	54.1
2	T1	1	0.0	0.005	0.0	LOS A	0.0	0.0	0.01	0.52	55.5
3	R2	1	0.0	0.005	5.5	LOS A	0.0	0.0	0.01	0.52	53.6
Approach		9	0.0	0.005	4.9	NA	0.0	0.0	0.01	0.52	54.2
East: Brodie Street											
4	L2	19	0.0	0.030	5.5	LOS A	0.1	0.8	0.01	0.57	53.8
5	T1	7	14.3	0.030	4.3	LOS A	0.1	0.8	0.01	0.57	53.4
6	R2	13	16.7	0.030	5.7	LOS A	0.1	0.8	0.01	0.57	52.5
Approach		39	8.1	0.030	5.4	LOS A	0.1	0.8	0.01	0.57	53.3
North: New Road											
7	L2	1	0.0	0.002	5.6	LOS A	0.0	0.0	0.03	0.39	55.0
8	T1	1	0.0	0.002	0.0	LOS A	0.0	0.0	0.03	0.39	56.5
9	R2	1	0.0	0.002	5.5	LOS A	0.0	0.0	0.03	0.39	54.5
Approach		3	0.0	0.002	3.7	NA	0.0	0.0	0.03	0.39	55.3
West: Brodie Street											
10	L2	2	0.0	0.010	5.5	LOS A	0.0	0.2	0.02	0.59	53.7
11	T1	1	0.0	0.010	4.2	LOS A	0.0	0.2	0.02	0.59	53.8
12	R2	8	0.0	0.010	5.6	LOS A	0.0	0.2	0.02	0.59	53.1
Approach		12	0.0	0.010	5.4	LOS A	0.0	0.2	0.02	0.59	53.3
All Vehicles		63	5.0	0.030	5.2	NA	0.1	0.8	0.01	0.56	53.5

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
 \160831sidra16S1251000_SITE 4_New Road & Brodie St.sip6

MOVEMENT SUMMARY

▽ Site: PM - PRE - New Rd and Brodie St

New Site

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: New Road											
1	L2	8	0.0	0.016	5.5	LOS A	0.0	0.1	0.00	0.18	56.8
2	T1	22	0.0	0.016	0.0	LOS A	0.0	0.1	0.00	0.18	58.4
3	R2	1	0.0	0.016	5.5	LOS A	0.0	0.1	0.00	0.18	56.2
Approach		32	0.0	0.016	1.7	NA	0.0	0.1	0.00	0.18	57.9
East: Brodie Street											
4	L2	12	0.0	0.014	5.5	LOS A	0.1	0.4	0.01	0.56	54.0
5	T1	7	0.0	0.014	4.2	LOS A	0.1	0.4	0.01	0.56	54.2
6	R2	1	0.0	0.014	5.6	LOS A	0.1	0.4	0.01	0.56	53.5
Approach		20	0.0	0.014	5.1	LOS A	0.1	0.4	0.01	0.56	54.0
North: New Road											
7	L2	1	0.0	0.002	5.6	LOS A	0.0	0.0	0.07	0.37	54.9
8	T1	1	0.0	0.002	0.0	LOS A	0.0	0.0	0.07	0.37	56.3
9	R2	1	0.0	0.002	5.5	LOS A	0.0	0.0	0.07	0.37	54.3
Approach		3	0.0	0.002	3.7	NA	0.0	0.0	0.07	0.37	55.2
West: Brodie Street											
10	L2	7	0.0	0.019	5.6	LOS A	0.1	0.5	0.09	0.56	53.4
11	T1	1	0.0	0.019	4.2	LOS A	0.1	0.5	0.09	0.56	53.6
12	R2	15	0.0	0.019	5.6	LOS A	0.1	0.5	0.09	0.56	52.9
Approach		23	0.0	0.019	5.6	LOS A	0.1	0.5	0.09	0.56	53.1
All Vehicles		78	0.0	0.019	3.8	NA	0.1	0.5	0.03	0.40	55.3

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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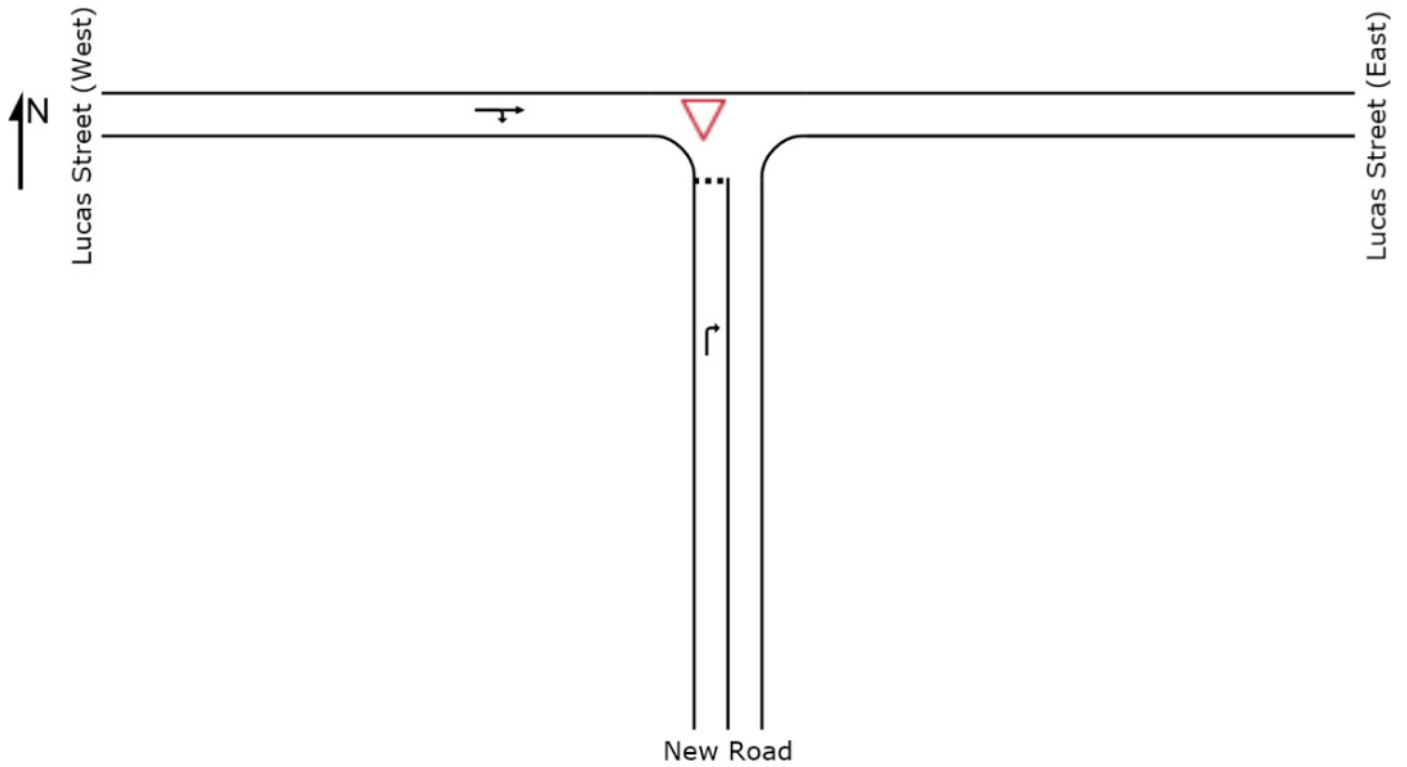
Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
 \160831sidra16S1251000_SITE 4_New Road & Brodie St.sip6

SITE LAYOUT

▽ Site: AM - PRE - Lucas St and RPA Access

New Site

Giveaway / Yield (Two-Way)



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\160831sidra16S1251000_SITE 5_Lucas St & RPA Access.sip6

MOVEMENT SUMMARY

▽ Site: AM - PRE - Lucas St and RPA Access

New Site

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	m		per veh	km/h
South: New Road											
3	R2	15	14.3	0.012	5.9	LOS A	0.0	0.3	0.12	0.58	52.0
Approach		15	14.3	0.012	5.9	LOS A	0.0	0.3	0.12	0.58	52.0
West: Lucas Street (West)											
11	T1	61	0.0	0.031	0.0	LOS A	0.0	0.0	0.00	0.02	59.8
12	R2	2	0.0	0.031	5.7	LOS A	0.0	0.0	0.00	0.02	57.4
Approach		63	0.0	0.031	0.2	NA	0.0	0.0	0.00	0.02	59.7
All Vehicles		78	2.7	0.031	1.3	NA	0.0	0.3	0.02	0.13	58.1

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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\160831sidra16S1251000_SITE 5_Lucas St & RPA Access.sip6

MOVEMENT SUMMARY

▽ Site: PM - PRE - Lucas St and RPA Access

New Site

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m		per veh	km/h
South: New Road											
3	R2	31	0.0	0.022	5.7	LOS A	0.1	0.5	0.08	0.59	52.7
Approach		31	0.0	0.022	5.7	LOS A	0.1	0.5	0.08	0.59	52.7
West: Lucas Street (West)											
11	T1	31	0.0	0.015	0.0	LOS A	0.0	0.0	0.00	0.02	59.8
12	R2	1	0.0	0.015	5.7	LOS A	0.0	0.0	0.00	0.02	57.4
Approach		32	0.0	0.015	0.2	NA	0.0	0.0	0.00	0.02	59.7
All Vehicles		62	0.0	0.022	2.9	NA	0.1	0.5	0.04	0.30	56.1

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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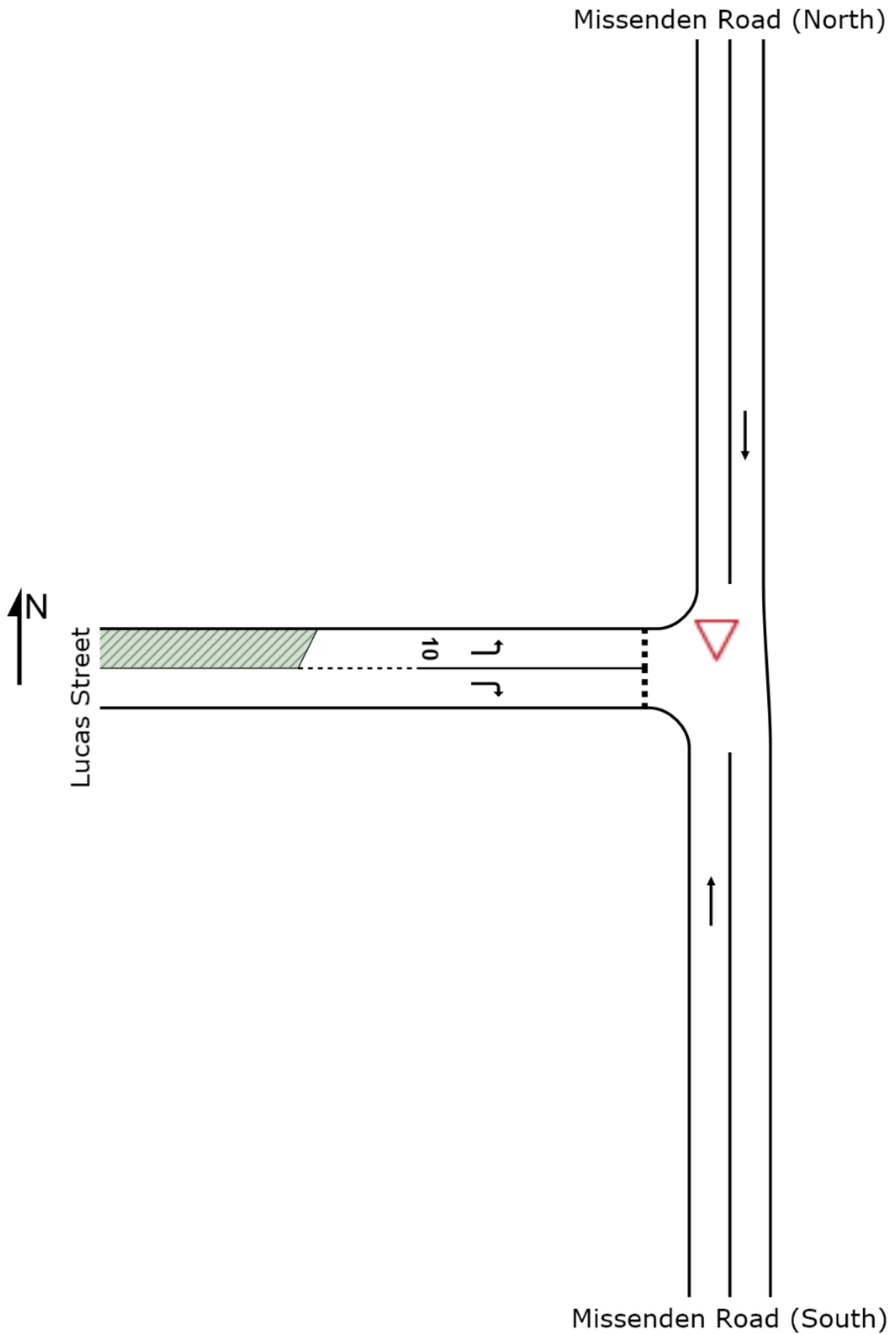
Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
\160831sidra16S1251000_SITE 5_Lucas St & RPA Access.sip6

SITE LAYOUT

▽ Site: AM - PRE - Lucas St and Missenden Rd

New Site

Giveaway / Yield (Two-Way)



MOVEMENT SUMMARY

▽ Site: AM - PRE - Lucas St and Missenden Rd

New Site

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Missenden Road (South)											
2	T1	349	4.2	0.177	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		349	4.2	0.177	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: Missenden Road (North)											
8	T1	482	4.4	0.253	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		482	4.4	0.253	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: Lucas Street											
10	L2	35	0.0	0.030	6.7	LOS A	0.1	0.8	0.39	0.60	52.4
12	R2	19	5.6	0.038	10.6	LOS A	0.1	0.9	0.61	0.83	49.2
Approach		54	2.0	0.038	8.1	LOS A	0.1	0.9	0.47	0.68	51.2
All Vehicles		885	4.2	0.253	0.5	NA	0.1	0.9	0.03	0.04	59.3

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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\160831sidra16S1251000_SITE 6_Lucas Street and Missenden Road.sip6

MOVEMENT SUMMARY

▽ Site: PM - PRE - Lucas St and Missenden Rd

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Missenden Road (South)											
2	T1	459	3.0	0.230	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		459	3.0	0.230	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: Missenden Road (North)											
8	T1	512	2.9	0.266	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		512	2.9	0.266	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: Lucas Street											
10	L2	55	0.0	0.053	7.3	LOS A	0.2	1.4	0.46	0.66	52.2
12	R2	25	8.3	0.062	12.5	LOS A	0.2	1.4	0.68	0.88	47.9
Approach		80	2.6	0.062	8.9	LOS A	0.2	1.4	0.53	0.73	50.8
All Vehicles		1051	2.9	0.266	0.7	NA	0.2	1.4	0.04	0.06	59.1

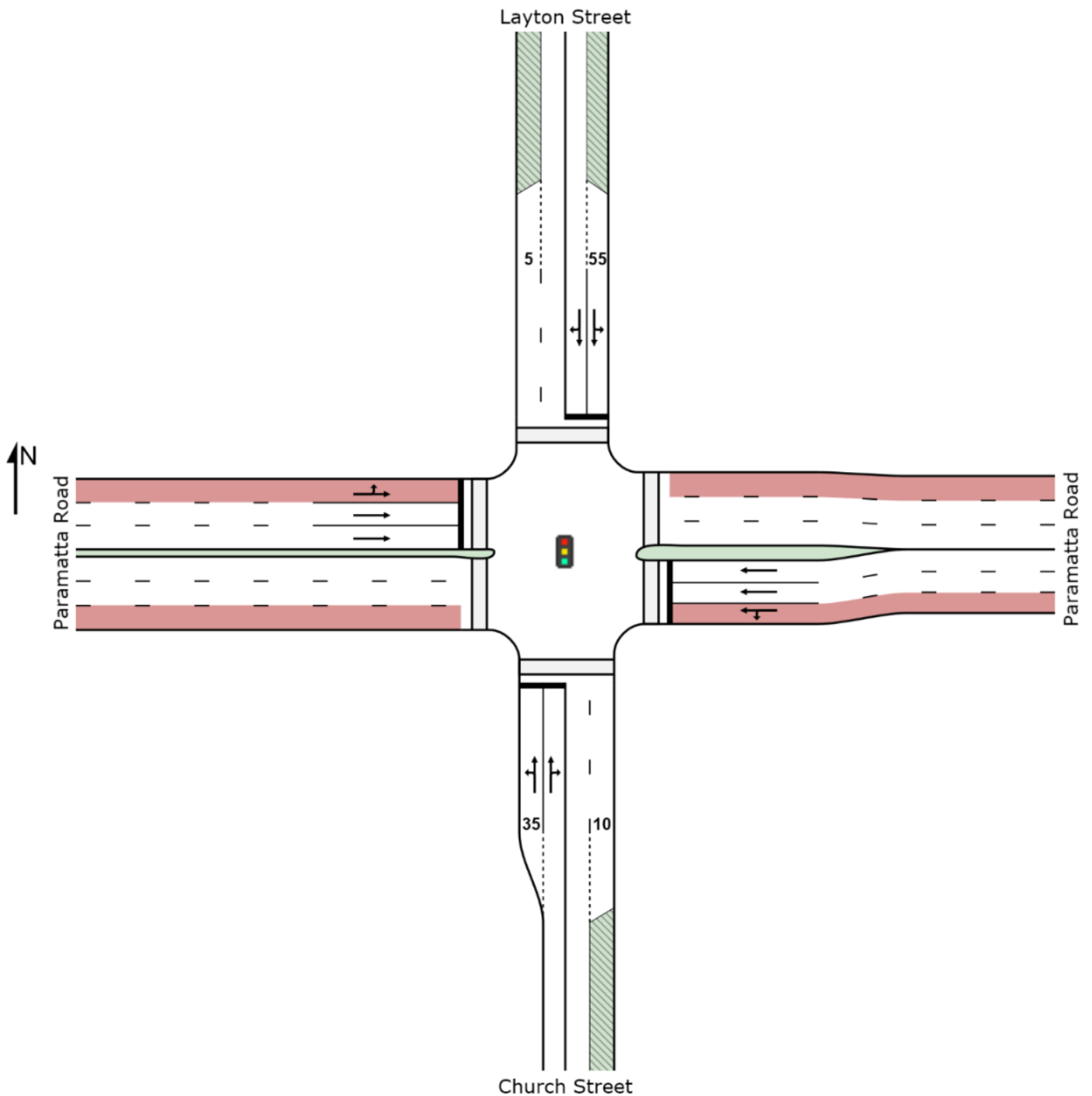
Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control 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.

SITE LAYOUT

 **Site: AM - PRE - Church St, Layton St & Paramatta Rd**

New Site

Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY

 **Site: AM - PRE - Church St, Layton St & Paramatta Rd**

New Site
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Church Street											
1	L2	18	0.0	0.101	58.2	LOS E	1.8	13.2	0.88	0.69	30.9
2	T1	14	7.1	0.101	52.6	LOS D	1.8	13.2	0.88	0.69	31.4
3	R2	57	7.0	0.262	62.7	LOS E	3.5	26.0	0.92	0.76	29.2
Approach		89	5.6	0.262	60.2	LOS E	3.5	26.0	0.90	0.73	29.8
East: Paramatta Road											
4	L2	37	8.1	0.055	6.0	LOS A	0.1	0.8	0.02	0.28	55.0
5	T1	965	6.4	0.342	0.5	LOS A	0.9	6.9	0.03	0.03	59.4
Approach		1002	6.5	0.342	0.6	LOS A	0.9	6.9	0.03	0.04	59.3
North: Layton Street											
7	L2	17	23.5	0.141	59.0	LOS E	2.5	18.6	0.89	0.70	30.8
8	T1	49	0.0	0.141	53.3	LOS D	2.5	18.6	0.88	0.70	31.5
9	R2	15	6.7	0.141	59.0	LOS E	2.3	16.2	0.88	0.69	31.0
Approach		81	6.2	0.141	55.6	LOS D	2.5	18.6	0.88	0.70	31.3
West: Paramatta Road											
10	L2	13	7.7	0.060	6.0	LOS A	0.1	0.9	0.02	0.09	56.9
11	T1	2020	6.6	0.708	0.8	LOS A	4.3	31.3	0.07	0.07	59.2
Approach		2033	6.6	0.708	0.8	LOS A	4.3	31.3	0.07	0.07	59.2
All Vehicles		3205	6.5	0.708	3.8	LOS A	4.3	31.3	0.10	0.09	56.4

Level of Service (LOS) Method: Delay (RTA NSW).
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.

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
P1	South Full Crossing	26	7.6	LOS A	0.0	0.0	0.33	0.33
P2	East Full Crossing	16	62.3	LOS F	0.1	0.1	0.94	0.94
P3	North Full Crossing	51	7.2	LOS A	0.1	0.1	0.32	0.32
P4	West Full Crossing	55	62.4	LOS F	0.2	0.2	0.95	0.95
All Pedestrians		148	33.7	LOS D			0.62	0.62

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: PM - PRE - Church St, Layton St & Paramatta Rd

New Site

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Church Street											
1	L2	54	0.0	0.299	60.5	LOS E	5.8	40.7	0.92	0.75	30.3
2	T1	42	2.4	0.299	54.9	LOS D	5.8	40.7	0.92	0.75	30.8
3	R2	65	6.2	0.328	66.1	LOS E	4.1	30.4	0.95	0.77	28.4
Approach		161	3.1	0.328	61.3	LOS E	5.8	40.7	0.93	0.76	29.6
East: Paramatta Road											
4	L2	38	7.9	0.056	6.0	LOS A	0.1	0.8	0.02	0.28	55.0
5	T1	1808	3.4	0.639	0.7	LOS A	3.2	22.8	0.06	0.06	59.3
Approach		1846	3.5	0.639	0.8	LOS A	3.2	22.8	0.06	0.06	59.2
North: Layton Street											
7	L2	19	21.1	0.203	59.7	LOS E	3.7	27.2	0.90	0.71	30.8
8	T1	46	0.0	0.203	54.2	LOS D	3.7	27.2	0.90	0.71	31.4
9	R2	36	2.8	0.203	64.9	LOS E	2.4	17.2	0.93	0.74	28.8
Approach		101	5.0	0.203	59.0	LOS E	3.7	27.2	0.91	0.72	30.3
West: Paramatta Road											
10	L2	22	4.5	0.067	6.0	LOS A	0.1	1.0	0.02	0.13	56.4
11	T1	1302	10.2	0.458	0.6	LOS A	1.5	11.3	0.04	0.04	59.4
Approach		1324	10.1	0.458	0.6	LOS A	1.5	11.3	0.04	0.04	59.3
All Vehicles		3432	6.1	0.639	5.3	LOS A	5.8	40.7	0.12	0.11	55.1

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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
P1	South Full Crossing	26	7.6	LOS A	0.0	0.0	0.33	0.33
P2	East Full Crossing	16	62.3	LOS F	0.1	0.1	0.94	0.94
P3	North Full Crossing	51	7.2	LOS A	0.1	0.1	0.32	0.32
P4	West Full Crossing	55	62.4	LOS F	0.2	0.2	0.95	0.95
All Pedestrians		148	33.7	LOS D			0.62	0.62

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.

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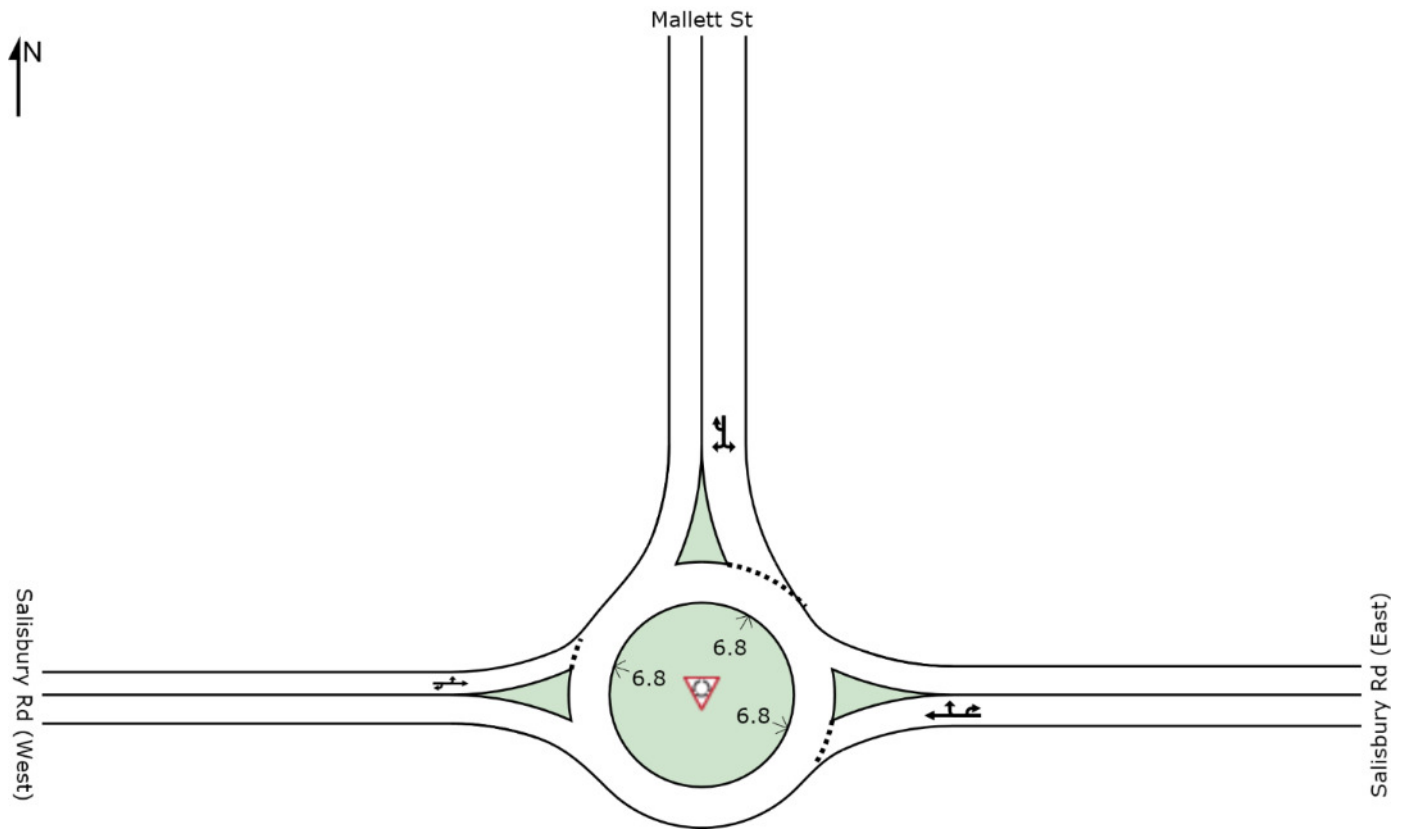
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Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment\160831_16S1251000_SITE 7_Paramatta Rd & Layton Rd & Church St.sip6

SITE LAYOUT

 **Site: AM - PRE - Salisbury Rd and Mallett St**

New Site
Roundabout



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\160831sidra16S1251000_SITE 8_Salisbury Rd and Mallett St.sip6

MOVEMENT SUMMARY

 **Site: AM - PRE - Salisbury Rd and Mallett St**

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Salisbury Rd (East)											
5	T1	213	2.5	0.317	6.2	LOS A	2.2	16.0	0.50	0.62	52.2
6	R2	92	3.4	0.317	8.9	LOS A	2.2	16.0	0.50	0.62	51.7
6u	U	23	0.0	0.317	10.3	LOS A	2.2	16.0	0.50	0.62	52.2
Approach		327	2.6	0.317	7.3	LOS A	2.2	16.0	0.50	0.62	52.0
North: Mallett St											
7	L2	121	3.5	0.462	10.6	LOS A	3.3	23.2	0.83	0.96	48.5
9	R2	175	1.2	0.462	12.6	LOS A	3.3	23.2	0.83	0.96	49.0
9u	U	1	0.0	0.462	14.0	LOS A	3.3	23.2	0.83	0.96	49.4
Approach		297	2.1	0.462	11.8	LOS A	3.3	23.2	0.83	0.96	48.8
West: Salisbury Rd (West)											
10	L2	255	2.1	0.792	7.4	LOS A	13.0	91.8	0.86	0.58	50.9
11	T1	706	1.2	0.792	7.2	LOS A	13.0	91.8	0.86	0.58	51.6
12u	U	4	0.0	0.792	11.3	LOS A	13.0	91.8	0.86	0.58	51.6
Approach		965	1.4	0.792	7.3	LOS A	13.0	91.8	0.86	0.58	51.4
All Vehicles		1589	1.8	0.792	8.1	LOS A	13.0	91.8	0.78	0.66	51.0

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Roundabout Capacity Model: SIDRA Standard.

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.

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Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
\160831sidra16S1251000_SITE 8_Salisbury Rd and Mallett St.sip6

MOVEMENT SUMMARY

 **Site: PM - PRE - Salisbury Rd and Mallett St**

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Salisbury Rd (East)											
5	T1	594	0.7	0.746	11.2	LOS A	10.3	72.6	0.92	0.95	50.7
6	R2	125	0.0	0.746	15.8	LOS B	10.3	72.6	0.92	0.95	50.7
6u	U	18	0.0	0.746	17.9	LOS B	10.3	72.6	0.92	0.95	51.5
Approach		737	0.6	0.746	12.2	LOS A	10.3	72.6	0.92	0.95	50.7
North: Mallett St											
7	L2	48	0.0	0.410	5.8	LOS A	2.4	16.9	0.58	0.75	50.7
9	R2	380	0.3	0.410	10.5	LOS A	2.4	16.9	0.58	0.75	51.8
9u	U	4	0.0	0.410	12.6	LOS A	2.4	16.9	0.58	0.75	52.7
Approach		433	0.2	0.410	10.0	LOS A	2.4	16.9	0.58	0.75	51.7
West: Salisbury Rd (West)											
10	L2	203	0.0	0.498	5.2	LOS A	5.2	36.7	0.61	0.54	53.0
11	T1	399	1.3	0.498	5.6	LOS A	5.2	36.7	0.61	0.54	54.2
12u	U	9	0.0	0.498	12.2	LOS A	5.2	36.7	0.61	0.54	55.2
Approach		612	0.9	0.498	5.5	LOS A	5.2	36.7	0.61	0.54	53.8
All Vehicles		1781	0.6	0.746	9.4	LOS A	10.3	72.6	0.73	0.76	52.0

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Roundabout Capacity Model: SIDRA Standard.

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.

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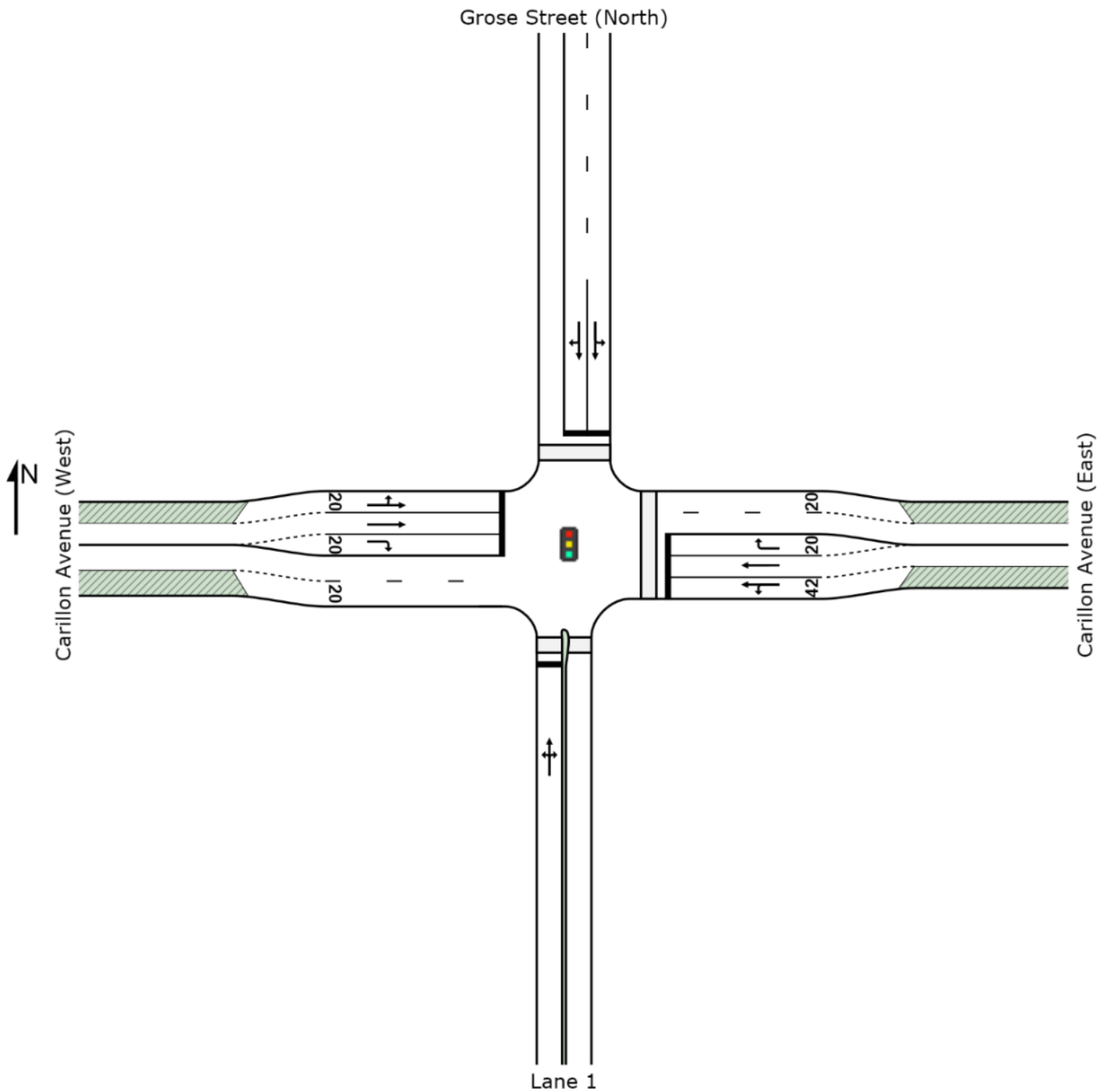
Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
\160831sidra16S1251000_SITE 8_Salisbury Rd and Mallett St.sip6

SITE LAYOUT

 **Site: AM - PRE - Carillon St and Hospital Access**

New Site

Signals - Fixed Time Isolated



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Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
\160901sidra16S1251000_SITE 9_Carillon Street and Hospital Access.sip6

MOVEMENT SUMMARY



Site: AM - PRE - Carillon St and Hospital Access

New Site

Signals - Fixed Time Isolated Cycle Time = 105 seconds (User-Given Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Lane 1											
1	L2	8	0.0	0.116	59.2	LOS E	0.6	4.2	0.98	0.68	30.1
2	T1	1	0.0	0.116	53.6	LOS D	0.6	4.2	0.98	0.68	30.6
3	R2	2	0.0	0.116	59.2	LOS E	0.6	4.2	0.98	0.68	30.1
Approach		12	0.0	0.116	58.7	LOS E	0.6	4.2	0.98	0.68	30.2
East: Carillon Avenue (East)											
4	L2	1	0.0	0.033	7.2	LOS A	0.4	3.1	0.18	0.15	56.8
5	T1	297	1.8	0.159	1.8	LOS A	2.4	17.3	0.21	0.18	58.2
6	R2	105	0.0	0.198	9.6	LOS A	1.6	11.1	0.31	0.67	50.4
Approach		403	1.3	0.198	3.9	LOS A	2.4	17.3	0.23	0.30	56.0
North: Grose Street (North)											
7	L2	4	25.0	0.047	59.1	LOS E	0.2	1.8	0.97	0.64	29.8
8	T1	1	0.0	0.130	53.6	LOS D	0.7	4.9	0.98	0.68	30.6
9	R2	13	0.0	0.130	59.1	LOS E	0.7	4.9	0.98	0.68	30.1
Approach		18	5.9	0.130	58.8	LOS E	0.7	4.9	0.98	0.67	30.1
West: Carillon Avenue (West)											
10	L2	224	0.5	0.150	7.4	LOS A	2.2	15.4	0.21	0.63	52.2
11	T1	611	1.9	0.457	2.4	LOS A	7.8	55.3	0.27	0.25	57.7
12	R2	3	0.0	0.004	7.5	LOS A	0.0	0.2	0.20	0.60	51.9
Approach		838	1.5	0.457	3.8	LOS A	7.8	55.3	0.26	0.35	56.1
All Vehicles		1271	1.5	0.457	5.1	LOS A	7.8	55.3	0.27	0.35	55.0

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P1	South Full Crossing	86	2.5	LOS A	0.1	0.1	0.22	0.22	
P2	East Full Crossing	14	46.7	LOS E	0.0	0.0	0.94	0.94	
P3	North Full Crossing	46	3.0	LOS A	0.0	0.0	0.24	0.24	
All Pedestrians		146	6.8	LOS A			0.29	0.29	

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.

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 \160901sidra16S1251000_SITE 9_Carillon Street and Hospital Access.sip6

MOVEMENT SUMMARY



Site: PM - PRE - Carillon St and Hospital Access

New Site

Signals - Fixed Time Isolated Cycle Time = 105 seconds (User-Given Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Lane 1											
1	L2	1	0.0	0.029	54.3	LOS D	0.2	1.4	0.94	0.63	31.7
2	T1	1	0.0	0.029	48.7	LOS D	0.2	1.4	0.94	0.63	32.1
3	R2	2	0.0	0.029	54.3	LOS D	0.2	1.4	0.94	0.63	31.6
Approach		4	0.0	0.029	52.9	LOS D	0.2	1.4	0.94	0.63	31.7
East: Carillon Avenue (East)											
4	L2	1	0.0	0.069	8.1	LOS A	1.1	8.0	0.23	0.20	56.0
5	T1	605	0.0	0.337	3.2	LOS A	7.2	50.2	0.29	0.26	57.0
6	R2	6	0.0	0.009	9.2	LOS A	0.1	0.6	0.27	0.62	50.7
Approach		613	0.0	0.337	3.2	LOS A	7.2	50.2	0.29	0.27	56.9
North: Hospital Access											
7	L2	48	0.0	0.278	55.1	LOS D	2.4	16.8	0.97	0.74	31.0
8	T1	1	0.0	0.312	49.9	LOS D	2.6	18.4	0.97	0.75	31.4
9	R2	52	0.0	0.312	55.4	LOS D	2.6	18.4	0.97	0.75	31.0
Approach		101	0.0	0.312	55.2	LOS D	2.6	18.4	0.97	0.74	31.0
West: Carillon Avenue (West)											
10	L2	6	0.0	0.053	8.1	LOS A	0.9	6.0	0.23	0.22	55.7
11	T1	455	0.0	0.256	3.0	LOS A	5.0	35.2	0.27	0.24	57.2
12	R2	1	0.0	0.002	9.7	LOS A	0.0	0.1	0.28	0.60	50.3
Approach		462	0.0	0.256	3.0	LOS A	5.0	35.2	0.27	0.24	57.1
All Vehicles		1180	0.0	0.337	7.8	LOS A	7.2	50.2	0.35	0.30	53.0

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P1	South Full Crossing	45	3.5	LOS A	0.0	0.0	0.26	0.26	
P2	East Full Crossing	7	46.7	LOS E	0.0	0.0	0.94	0.94	
P3	North Full Crossing	31	4.0	LOS A	0.0	0.0	0.28	0.28	
All Pedestrians		83	7.5	LOS A			0.33	0.33	

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.

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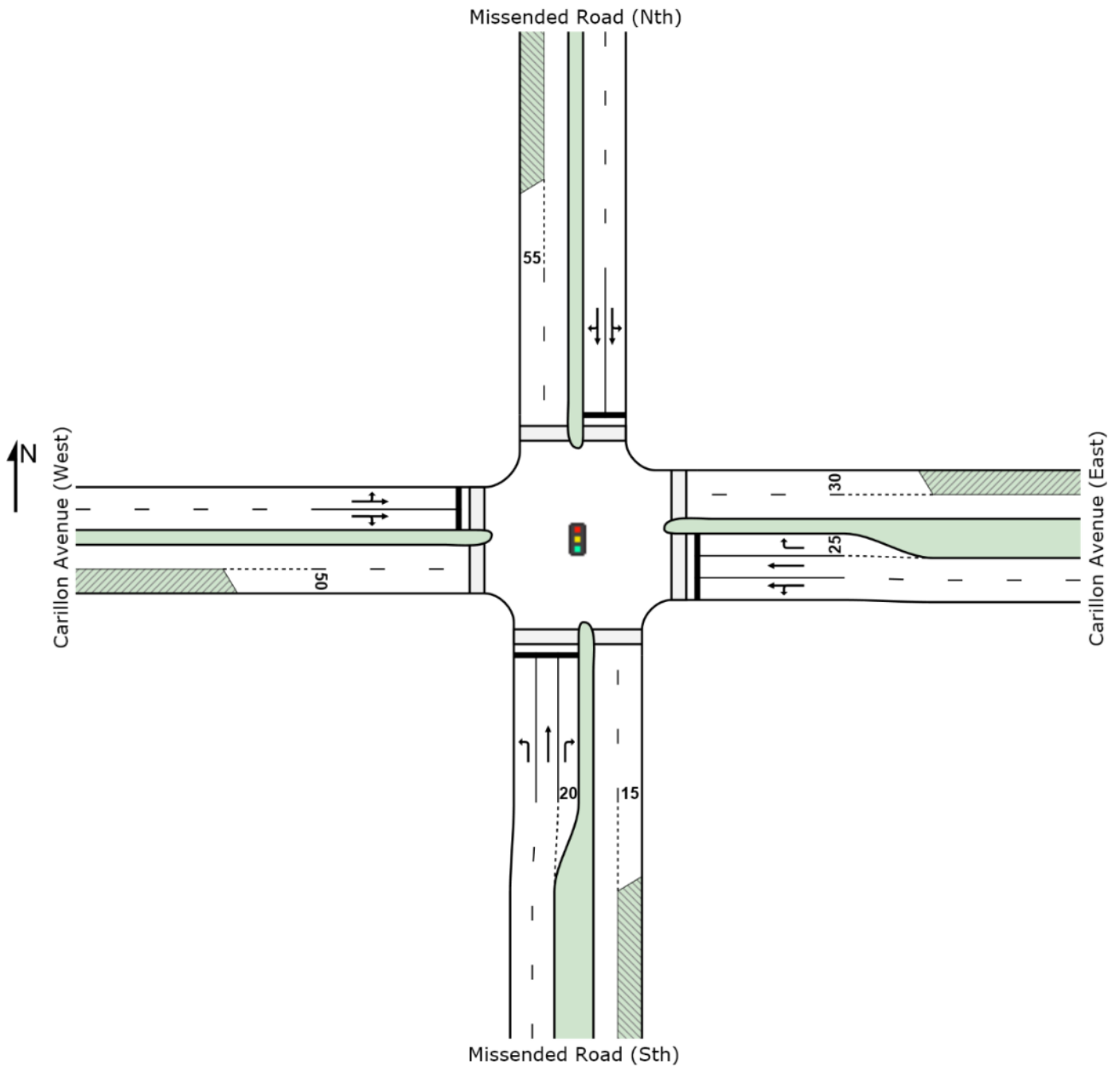
Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
 \160901sidra16S1251000_SITE 9_Carillon Street and Hospital Access.sip6

SITE LAYOUT

 **Site: AM - PRE - Carillon St and Missenden Rd**

New Site

Signals - Fixed Time Isolated



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\160901sidra16S1251000_SITE 10_Carillon Street and Missenden Road.sip6

MOVEMENT SUMMARY



Site: AM - PRE - Carillon St and Missenden Rd

New Site

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Missended Road (Sth)											
1	L2	111	1.0	0.087	10.0	LOS A	1.7	12.1	0.34	0.65	50.3
2	T1	253	3.3	0.471	33.0	LOS C	11.3	81.7	0.82	0.69	39.0
3	R2	42	5.0	0.201	51.7	LOS D	2.2	15.7	0.89	0.74	32.0
Approach		405	2.9	0.471	28.7	LOS C	11.3	81.7	0.69	0.69	40.5
East: Carillon Avenue (East)											
4	L2	27	0.0	0.237	54.7	LOS D	3.5	24.6	0.92	0.73	32.1
5	T1	208	1.5	0.706	53.0	LOS D	9.7	68.6	0.97	0.82	32.0
6	R2	86	4.9	0.326	55.7	LOS D	4.6	33.6	0.94	0.77	30.8
Approach		322	2.3	0.706	53.8	LOS D	9.7	68.6	0.96	0.80	31.7
North: Missended Road (Nth)											
7	L2	149	3.5	0.175	21.5	LOS B	4.6	33.0	0.59	0.72	43.3
8	T1	194	3.8	0.690	43.5	LOS D	15.0	108.6	0.96	0.84	34.5
9	R2	85	4.9	0.690	49.1	LOS D	15.0	108.6	0.96	0.84	33.8
Approach		428	3.9	0.690	37.0	LOS C	15.0	108.6	0.83	0.79	37.0
West: Carillon Avenue (West)											
10	L2	94	7.9	0.179	33.1	LOS C	4.5	33.6	0.72	0.72	38.6
11	T1	432	1.0	0.698	34.3	LOS C	23.7	168.3	0.90	0.81	38.0
12	R2	67	6.3	0.698	40.3	LOS C	23.7	168.3	0.91	0.81	37.3
Approach		593	2.7	0.698	34.8	LOS C	23.7	168.3	0.87	0.79	38.0
All Vehicles		1748	3.0	0.706	37.4	LOS C	23.7	168.3	0.84	0.77	36.9

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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
P1	South Full Crossing	53	54.3	LOS E	0.2	0.2	0.95	0.95
P2	East Full Crossing	53	36.9	LOS D	0.1	0.1	0.79	0.79
P3	North Full Crossing	53	31.6	LOS D	0.1	0.1	0.73	0.73
P4	West Full Crossing	53	34.6	LOS D	0.1	0.1	0.76	0.76
All Pedestrians		211	39.3	LOS D			0.81	0.81

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.

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 \160901sidra16S1251000_SITE 10_Carillon Street and Missenden Road.sip6

MOVEMENT SUMMARY



Site: PM - PRE - Carillon St and Missenden Rd

New Site

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Missended Road (Sth)											
1	L2	129	0.0	0.116	13.7	LOS A	2.8	19.3	0.45	0.68	47.8
2	T1	341	1.2	0.531	29.7	LOS C	14.9	105.3	0.80	0.69	40.4
3	R2	36	2.9	0.206	54.7	LOS D	1.9	13.6	0.91	0.74	31.2
Approach		506	1.0	0.531	27.4	LOS B	14.9	105.3	0.72	0.69	41.2
East: Carillon Avenue (East)											
4	L2	51	0.0	0.307	45.8	LOS D	6.7	47.0	0.86	0.73	34.9
5	T1	433	0.2	0.914	59.0	LOS E	23.0	161.3	0.96	1.00	30.4
6	R2	109	2.9	0.253	45.2	LOS D	5.2	37.2	0.85	0.77	33.9
Approach		593	0.7	0.914	55.3	LOS D	23.0	161.3	0.93	0.94	31.3
North: Missended Road (Nth)											
7	L2	205	0.5	0.195	13.5	LOS A	4.5	31.4	0.45	0.69	47.9
8	T1	260	3.2	0.919	65.8	LOS E	27.0	194.2	1.00	1.11	28.5
9	R2	119	2.7	0.919	71.4	LOS F	27.0	194.2	1.00	1.11	28.1
Approach		584	2.2	0.919	48.6	LOS D	27.0	194.2	0.81	0.96	33.1
West: Carillon Avenue (West)											
10	L2	61	8.6	0.232	46.7	LOS D	4.5	32.9	0.86	0.74	34.1
11	T1	351	0.0	0.905	61.5	LOS E	26.0	181.8	0.99	1.04	29.6
12	R2	65	0.0	0.905	69.1	LOS E	26.0	181.8	1.00	1.07	28.9
Approach		477	1.1	0.905	60.6	LOS E	26.0	181.8	0.97	1.00	30.0
All Vehicles		2160	1.3	0.919	48.1	LOS D	27.0	194.2	0.86	0.90	33.4

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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
P1	South Full Crossing	53	46.0	LOS E	0.2	0.2	0.88	0.88
P2	East Full Crossing	53	32.3	LOS D	0.1	0.1	0.73	0.73
P3	North Full Crossing	53	45.2	LOS E	0.2	0.2	0.87	0.87
P4	West Full Crossing	53	30.2	LOS D	0.1	0.1	0.71	0.71
All Pedestrians		211	38.4	LOS D			0.80	0.80

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.

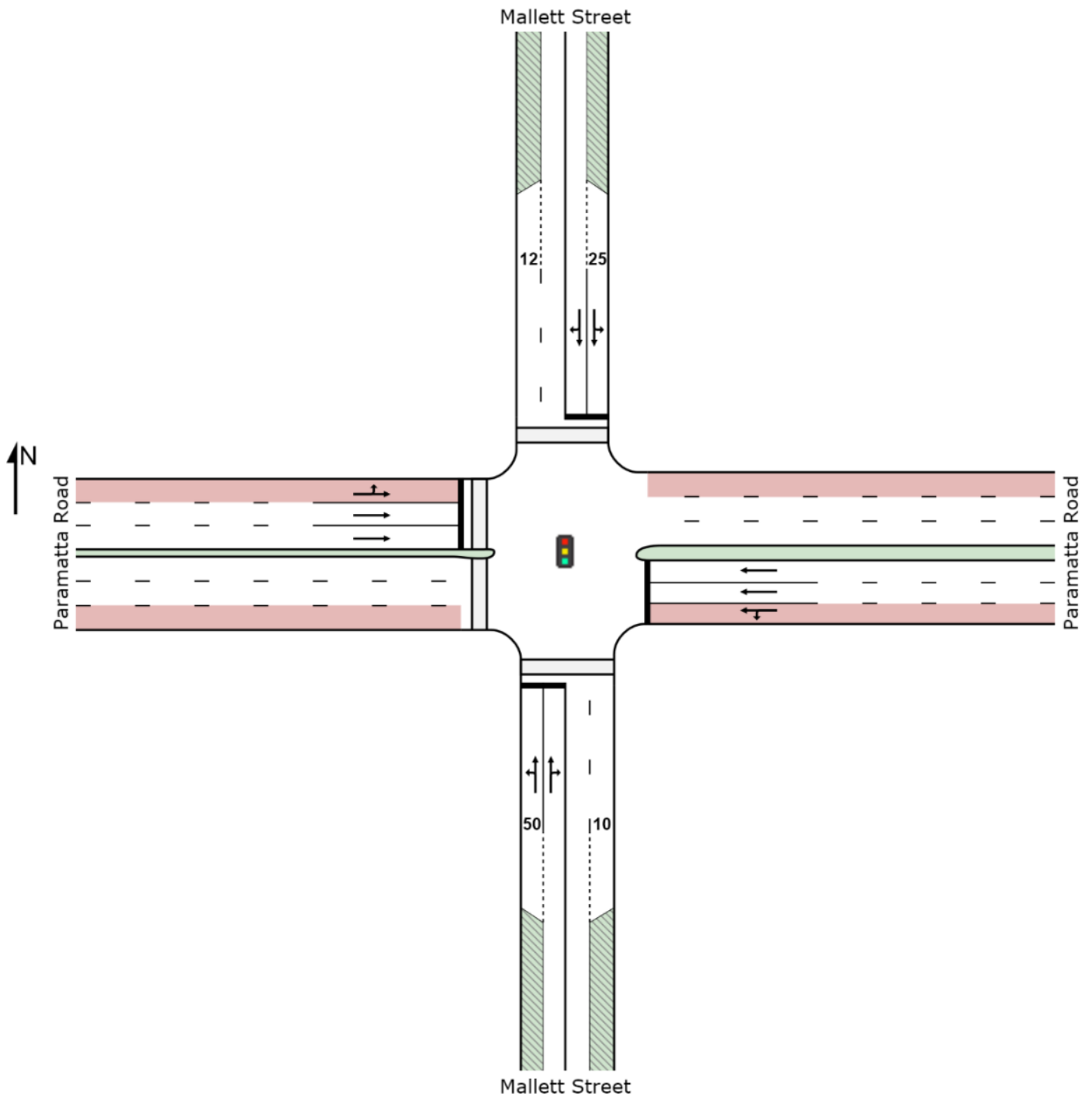
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

 **Site: AM - PRE - Paramatta Rd & Mallett St**

New Site

Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY



Site: AM - PRE - Paramatta Rd & Mallett St

New Site

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Mallett Street											
1	L2	38	0.0	0.602	59.1	LOS E	12.1	85.6	0.97	0.81	31.3
2	T1	203	2.0	0.753	58.0	LOS E	12.1	85.6	0.98	0.83	30.4
3	R2	46	4.3	0.753	80.3	LOS F	6.5	46.7	1.00	0.87	26.1
Approach		287	2.1	0.753	61.7	LOS E	12.1	85.6	0.98	0.83	29.8
East: Paramatta Road											
4	L2	35	2.9	0.063	6.0	LOS A	0.1	0.9	0.02	0.23	55.4
5	T1	977	5.5	0.339	0.5	LOS A	0.9	6.8	0.03	0.04	59.4
Approach		1012	5.4	0.339	0.6	LOS A	0.9	6.8	0.03	0.04	59.3
North: Mallett Street											
7	L2	70	7.1	0.714	60.1	LOS E	10.8	77.8	0.96	0.88	30.6
8	T1	203	1.0	0.793	63.0	LOS E	10.8	77.8	0.98	0.89	29.2
9	R2	27	0.0	0.793	78.4	LOS F	8.8	61.8	1.00	0.91	26.9
Approach		300	2.3	0.793	63.7	LOS E	10.8	77.8	0.98	0.89	29.3
West: Paramatta Road											
10	L2	22	9.1	0.066	6.0	LOS A	0.1	1.0	0.02	0.14	56.3
11	T1	1946	6.8	0.682	0.8	LOS A	3.8	27.9	0.06	0.06	59.2
Approach		1968	6.8	0.682	0.8	LOS A	3.8	27.9	0.06	0.06	59.2
All Vehicles		3567	5.7	0.793	11.0	LOS A	12.1	85.6	0.21	0.19	50.8

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	26	7.6	LOS A	0.0	0.0	0.33	0.33
P3	North Full Crossing	51	7.2	LOS A	0.1	0.1	0.32	0.32
P4	West Full Crossing	55	62.4	LOS F	0.2	0.2	0.95	0.95
All Pedestrians		132	30.3	LOS D			0.58	0.58

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.

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Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment\160902_16S1251000_SITE 11_Paramatta Rd & Mallett St.sip6

MOVEMENT SUMMARY



Site: PM - PRE - Paramatta Rd & Mallett St

New Site

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Mallett Street											
1	L2	48	2.1	0.664	62.0	LOS E	13.6	96.9	0.99	0.84	30.4
2	T1	236	1.7	0.664	60.0	LOS E	13.6	96.9	0.99	0.84	30.0
3	R2	38	0.0	0.664	74.7	LOS F	7.2	50.9	1.00	0.83	27.4
Approach		322	1.6	0.664	62.0	LOS E	13.6	96.9	0.99	0.84	29.7
East: Paramatta Road											
4	L2	95	1.1	0.127	6.0	LOS A	0.2	2.0	0.02	0.31	54.8
5	T1	1836	4.8	0.640	0.7	LOS A	3.2	22.9	0.06	0.06	59.2
Approach		1931	4.7	0.640	0.9	LOS A	3.2	22.9	0.06	0.07	59.0
North: Mallett Street											
7	L2	54	0.0	0.896	79.9	LOS F	15.2	106.6	0.98	1.05	26.5
8	T1	227	0.4	0.996	95.1	LOS F	15.2	106.6	0.98	1.12	23.3
9	R2	22	4.5	0.996	139.4	LOS F	10.2	72.4	0.99	1.25	18.6
Approach		303	0.7	0.996	95.6	LOS F	15.2	106.6	0.98	1.11	23.4
West: Paramatta Road											
10	L2	32	3.1	0.065	6.0	LOS A	0.1	1.0	0.02	0.20	55.7
11	T1	1223	4.1	0.416	0.5	LOS A	1.3	9.4	0.04	0.04	59.4
Approach		1255	4.1	0.416	0.6	LOS A	1.3	9.4	0.04	0.04	59.3
All Vehicles		3811	3.9	0.996	13.6	LOS A	15.2	106.6	0.20	0.21	49.0

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	26	7.6	LOS A	0.0	0.0	0.33	0.33	
P3	North Full Crossing	51	7.2	LOS A	0.1	0.1	0.32	0.32	
P4	West Full Crossing	55	62.4	LOS F	0.2	0.2	0.95	0.95	
All Pedestrians		132	30.3	LOS D			0.58	0.58	

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.

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Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment\160902_16S1251000_SITE 11_Paramatta Rd & Mallett St.sip6

SITE LAYOUT



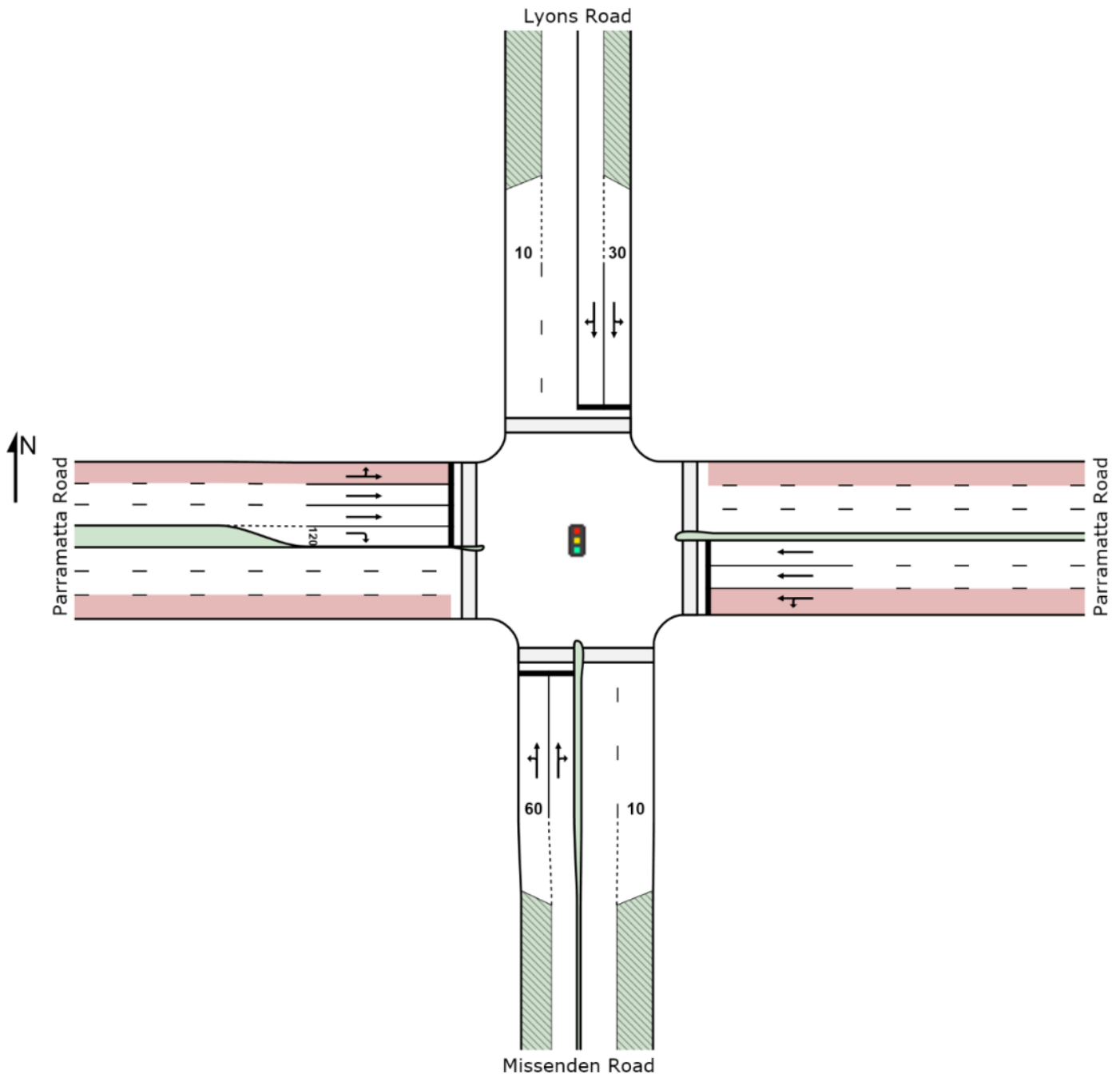
Site: AM - PRE - Parramatta Road and Missenden Road and Lyons Road

N105960

Lucas Street Car Park, Camperdown

Existing AM Peak

Signals - Fixed Time Coordinated



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Organisation: GTA CONSULTANTS | Created: Tuesday, 6 September 2016 2:53:52 PM

Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160906sid-N106360 Additional Intersections - Existing.sip6

MOVEMENT SUMMARY



Site: AM - PRE - Parramatta Road and Missenden Road and Lyons Road

N105960

Lucas Street Car Park, Camperdown

Existing AM Peak

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Missenden Road											
1	L2	100	1.1	0.293	48.7	LOS D	8.2	58.5	0.84	0.75	33.4
2	T1	145	3.6	0.586	50.6	LOS D	10.9	80.5	0.91	0.79	26.4
3	R2	81	10.4	0.586	60.6	LOS E	10.9	80.5	0.96	0.81	30.7
Approach		326	4.5	0.586	52.5	LOS D	10.9	80.5	0.90	0.78	29.8
East: Parramatta Road											
4	L2	151	5.6	0.228	27.1	LOS B	6.7	55.0	0.61	0.68	41.1
5	T1	929	7.5	0.485	24.9	LOS B	20.4	149.0	0.71	0.64	42.6
Approach		1080	7.2	0.485	25.1	LOS B	20.4	149.0	0.70	0.64	42.4
North: Lyons Road											
7	L2	62	3.4	0.287	51.8	LOS D	7.4	52.7	0.86	0.74	27.2
8	T1	204	1.5	0.287	46.2	LOS D	7.4	52.7	0.86	0.71	28.3
9	R2	1	0.0	0.287	51.8	LOS D	7.4	52.6	0.86	0.70	28.4
Approach		267	2.0	0.287	47.5	LOS D	7.4	52.7	0.86	0.72	28.1
West: Parramatta Road											
10	L2	16	13.3	0.082	6.2	LOS A	0.1	1.0	0.02	0.10	55.2
11	T1	2023	6.8	0.795	1.0	LOS A	6.0	43.6	0.10	0.09	59.0
12	R2	178	5.9	0.439	11.4	LOS A	2.2	16.5	0.35	0.66	49.6
Approach		2217	6.8	0.795	1.9	LOS A	6.0	43.6	0.12	0.14	58.1
All Vehicles		3891	6.4	0.795	15.8	LOS B	20.4	149.0	0.40	0.37	47.2

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	23	26.4	LOS C	0.1	0.1	0.61	0.61	
P2	East Full Crossing	103	54.3	LOS E	0.4	0.4	0.88	0.88	
P3	North Full Crossing	52	12.9	LOS B	0.1	0.1	0.43	0.43	
P4	West Full Crossing	161	54.4	LOS E	0.6	0.6	0.88	0.88	
All Pedestrians		339	46.1	LOS E			0.80	0.80	

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: PM - PRE - Parramatta Road and Missenden Road and Lyons Road

N105960

Lucas Street Car Park, Camperdown

Existing PM Peak

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Missenden Road											
1	L2	180	2.3	0.464	47.0	LOS D	11.8	83.9	0.84	0.78	33.7
2	T1	243	1.3	0.927	73.6	LOS F	21.4	153.9	0.97	1.04	21.5
3	R2	63	10.0	0.927	85.5	LOS F	21.4	153.9	1.00	1.09	25.7
Approach		486	2.8	0.927	65.3	LOS E	21.4	153.9	0.93	0.95	26.3
East: Parramatta Road											
4	L2	211	4.0	0.340	28.5	LOS C	10.6	88.4	0.65	0.70	40.6
5	T1	1720	4.8	0.881	39.5	LOS C	55.3	393.8	0.96	0.94	36.4
Approach		1931	4.7	0.881	38.2	LOS C	55.3	393.8	0.93	0.91	36.8
North: Lyons Road											
7	L2	39	5.4	0.203	50.7	LOS D	5.1	36.4	0.84	0.71	27.6
8	T1	127	1.7	0.203	47.1	LOS D	5.1	36.4	0.85	0.69	28.0
9	R2	6	0.0	0.203	54.2	LOS D	4.4	31.4	0.86	0.68	27.5
Approach		173	2.4	0.203	48.2	LOS D	5.1	36.4	0.85	0.70	27.9
West: Parramatta Road											
10	L2	35	0.0	0.087	6.1	LOS A	0.1	1.1	0.02	0.20	53.8
11	T1	1222	4.0	0.465	0.7	LOS A	1.5	10.2	0.04	0.04	59.2
12	R2	225	1.4	0.735	43.8	LOS D	9.9	70.2	0.92	0.92	34.6
Approach		1482	3.6	0.735	7.3	LOS A	9.9	70.2	0.17	0.18	53.3
All Vehicles		4072	4.0	0.927	30.7	LOS C	55.3	393.8	0.65	0.64	39.4

Level of Service (LOS) Method: Delay (RTA NSW).

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.

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	57	26.5	LOS C	0.1	0.1	0.62	0.62
P2	East Full Crossing	124	54.3	LOS E	0.4	0.4	0.88	0.88
P3	North Full Crossing	68	12.9	LOS B	0.1	0.1	0.43	0.43
P4	West Full Crossing	138	54.3	LOS E	0.5	0.5	0.88	0.88
All Pedestrians		387	42.9	LOS E			0.76	0.76

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.

SITE LAYOUT

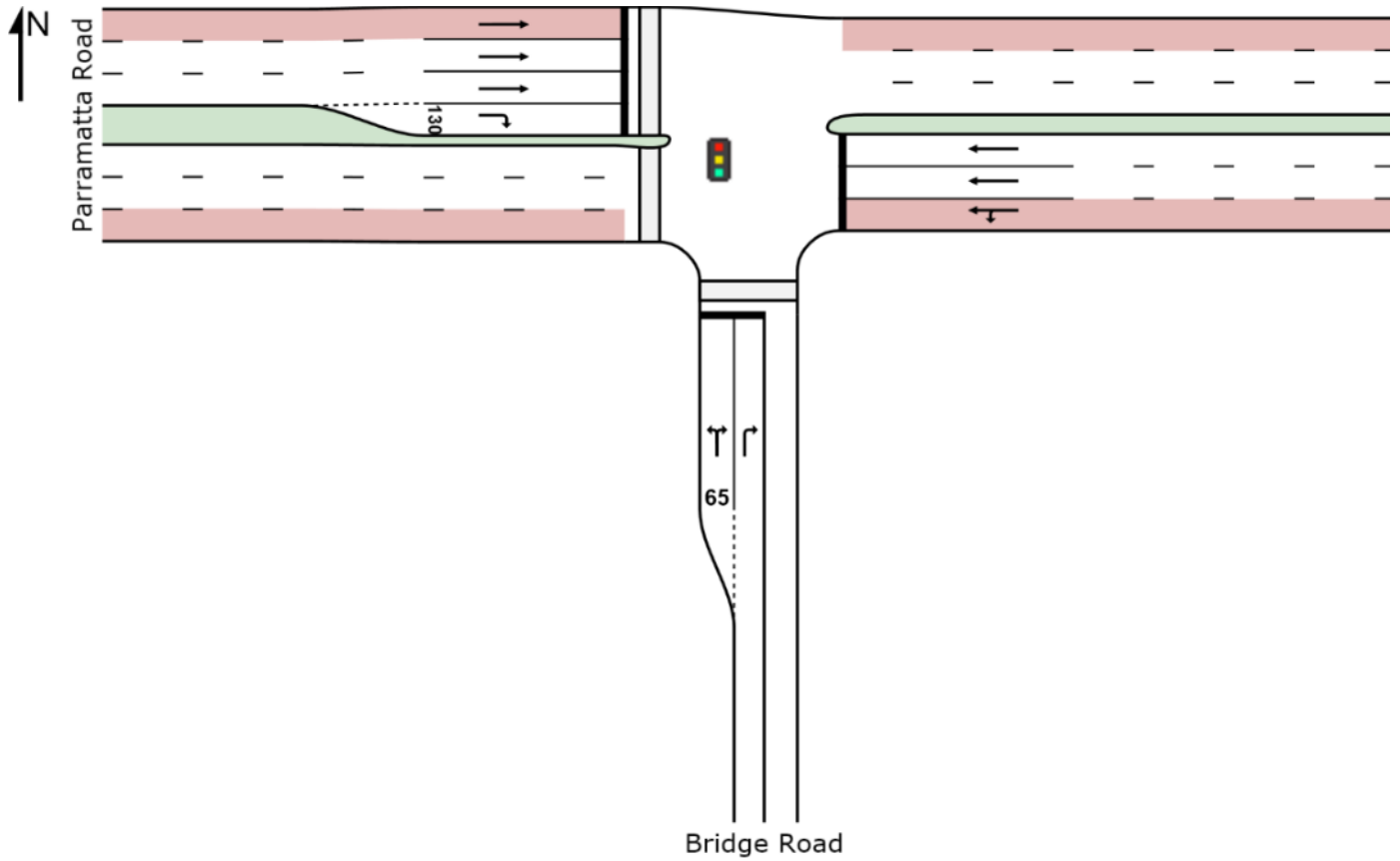
 **Site: AM - PRE - Parramatta Road and Bridge Road**

N105960

Lucas Street Car Park, Camperdown

Existing AM Peak

Signals - Fixed Time Coordinated



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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160904sid-N106360 Additional Intersections - Existing.sip6

MOVEMENT SUMMARY



Site: AM - PRE - Parramatta Road and Bridge Road

N105960

Lucas Street Car Park, Camperdown

Existing AM Peak

Signals - Fixed Time Coordinated Cycle Time = 130 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Bridge Road											
1	L2	66	6.3	0.994	108.3	LOS F	23.8	170.7	1.00	1.10	21.4
3	R2	468	1.8	0.994	108.4	LOS F	23.8	170.7	1.00	1.10	21.4
Approach		535	2.4	0.994	108.4	LOS F	23.8	170.7	1.00	1.10	21.4
East: Parramatta Road											
4	L2	157	4.0	0.105	5.8	LOS A	0.2	1.6	0.02	0.58	53.3
5	T1	1197	5.2	0.503	0.7	LOS A	1.5	10.7	0.04	0.04	59.3
Approach		1354	5.1	0.503	1.3	LOS A	1.5	10.7	0.04	0.10	58.5
West: Parramatta Road											
11	T1	2161	7.6	0.771	0.9	LOS A	5.5	40.9	0.09	0.08	59.1
12	R2	198	8.0	0.597	18.7	LOS B	9.1	68.2	0.79	0.83	44.9
Approach		2359	7.7	0.771	2.4	LOS A	9.1	68.2	0.15	0.15	57.6
All Vehicles		4247	6.2	0.994	15.4	LOS B	23.8	170.7	0.22	0.25	47.6

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P1	South Full Crossing	38	11.7	LOS B	0.1	0.1	0.42	0.42	
P4	West Full Crossing	108	59.4	LOS E	0.4	0.4	0.96	0.96	
All Pedestrians		146	47.0	LOS E			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.

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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160906sid-N106360 Additional Intersections - Existing.sip6

MOVEMENT SUMMARY



Site: PM - PRE - Parramatta Road and Bridge Road

N105960

Lucas Street Car Park, Camperdown

Existing PM Peak

Signals - Fixed Time Coordinated Cycle Time = 130 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Bridge Road											
1	L2	105	3.0	0.575	59.2	LOS E	10.9	77.3	0.97	0.82	30.0
3	R2	240	0.4	0.575	60.8	LOS E	10.9	77.3	0.98	0.81	29.6
Approach		345	1.2	0.575	60.3	LOS E	10.9	77.3	0.97	0.81	29.7
East: Parramatta Road											
4	L2	560	0.2	0.551	6.3	LOS A	1.5	11.2	0.04	0.50	53.4
5	T1	1804	6.0	0.726	0.9	LOS A	3.8	27.1	0.07	0.08	59.0
Approach		2364	4.6	0.726	2.1	LOS A	3.8	27.1	0.07	0.18	57.5
West: Parramatta Road											
11	T1	1440	4.3	0.479	0.6	LOS A	1.6	11.5	0.04	0.04	59.4
12	R2	168	1.9	0.751	59.3	LOS E	12.3	87.6	1.00	1.08	30.1
Approach		1608	4.1	0.751	6.7	LOS A	12.3	87.6	0.14	0.15	53.9
All Vehicles		4318	4.1	0.751	8.5	LOS A	12.3	87.6	0.17	0.22	52.3

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P1	South Full Crossing	69	11.7	LOS B	0.1	0.1	0.42	0.42	
P4	West Full Crossing	91	59.4	LOS E	0.3	0.3	0.96	0.96	
All Pedestrians		160	38.7	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.

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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160906sid-N106360 Additional Intersections - Existing.sip6

SITE LAYOUT

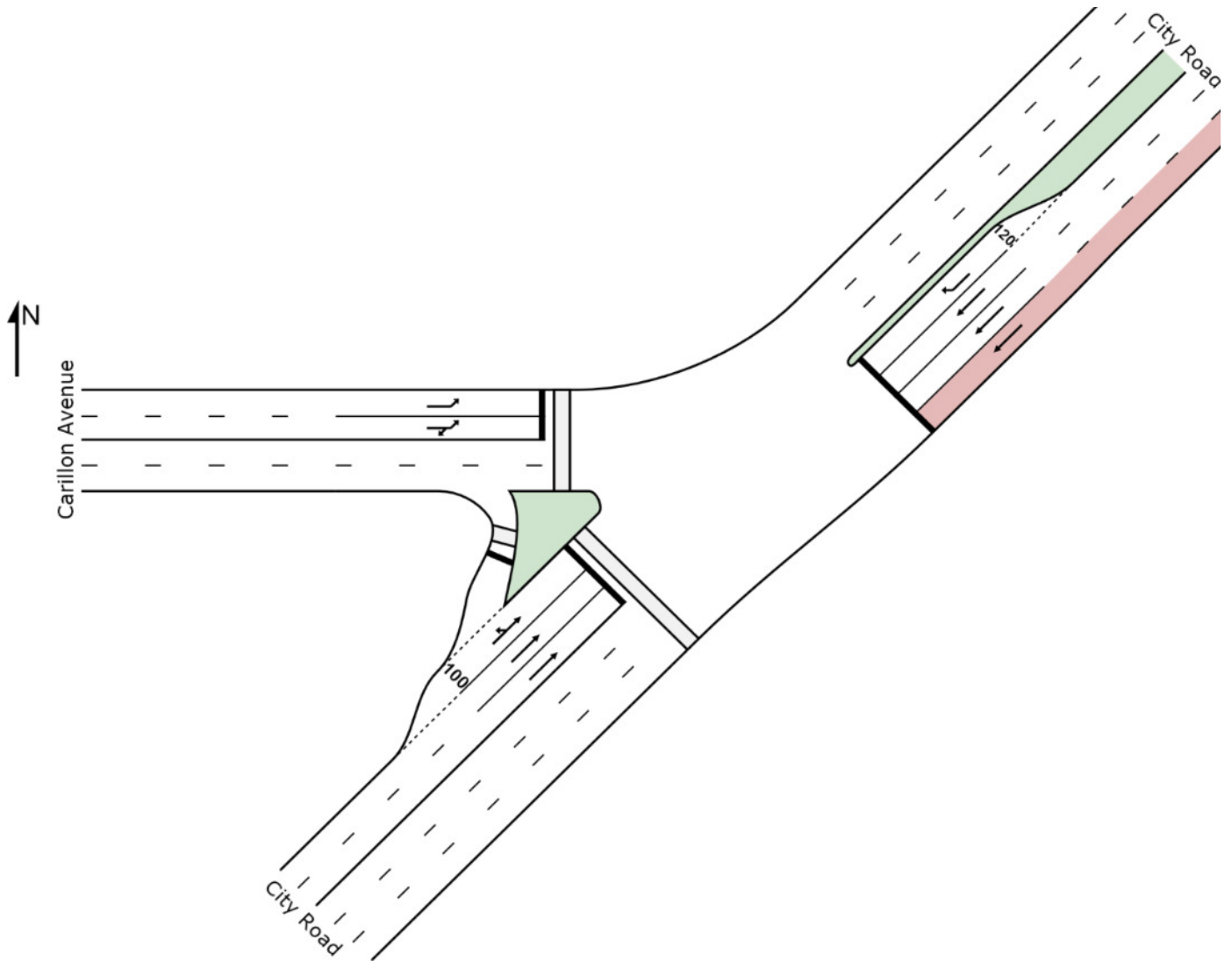
 **Site: AM - PRE - Carrillon Avenue and City Road**

N105960

Lucas Street Car Park, Campderdown

Existing AM Peak

Signals - Fixed Time Isolated



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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160904sid-N106360 Additional Intersections - Existing.sip6

MOVEMENT SUMMARY



Site: AM - PRE - Carrillon Avenue and City Road

N105960

Lucas Street Car Park, Camperdown

Existing AM Peak

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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
NorthEast: City Road											
25	T1	476	11.5	0.164	5.1	LOS A	3.9	28.8	0.32	0.27	49.5
26a	R1	292	2.2	0.599	46.6	LOS D	15.1	107.4	0.93	0.83	29.2
Approach		767	8.0	0.599	20.8	LOS B	15.1	107.4	0.55	0.48	36.1
West: Carillon Avenue											
10a	L1	456	3.0	0.403	31.0	LOS C	13.5	96.9	0.74	0.76	34.7
12b	R3	46	2.3	0.403	51.2	LOS D	7.3	52.3	0.91	0.79	26.5
Approach		502	2.9	0.403	32.8	LOS C	13.5	96.9	0.76	0.77	33.8
SouthWest: City Road											
30b	L3	64	1.6	0.151	19.2	LOS B	2.6	24.5	0.61	0.59	42.6
31	T1	1435	7.1	0.901	46.0	LOS D	46.2	335.9	0.97	1.01	20.6
Approach		1499	6.9	0.901	44.8	LOS D	46.2	335.9	0.96	0.99	21.2
All Vehicles		2768	6.5	0.901	36.0	LOS C	46.2	335.9	0.81	0.81	27.2

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P4	West Full Crossing	37	26.0	LOS C	0.1	0.1	0.66	0.66	
P8	SouthWest Full Crossing	62	54.3	LOS E	0.2	0.2	0.95	0.95	
P8S	SouthWest Slip/Bypass Lane Crossing	37	0.5	LOS A	0.0	0.0	0.13	0.13	
All Pedestrians		136	32.0	LOS D			0.65	0.65	

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.

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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160906sid-N106360 Additional Intersections - Existing.sip6

MOVEMENT SUMMARY



Site: PM - PRE - Carrillon Avenue and City Road

N105960

Lucas Street Car Park, Camperdown

Existing PM Peak

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
NorthEast: City Road											
25	T1	1038	6.0	0.348	5.6	LOS A	9.9	70.4	0.37	0.33	48.5
26a	R1	504	1.0	0.678	36.7	LOS C	24.3	171.8	0.89	0.84	32.7
Approach		1542	4.4	0.678	15.8	LOS B	24.3	171.8	0.54	0.50	39.5
West: Carrillon Avenue											
10a	L1	533	2.0	0.459	19.1	LOS B	16.6	118.0	0.60	0.73	41.4
12b	R3	108	0.0	0.459	56.3	LOS D	6.5	45.3	0.95	0.80	24.9
Approach		641	1.6	0.459	25.4	LOS B	16.6	118.0	0.66	0.74	37.5
SouthWest: City Road											
30b	L3	81	2.6	0.262	31.6	LOS C	4.5	42.3	0.77	0.72	35.1
31	T1	822	6.5	0.669	38.8	LOS C	19.9	140.2	0.93	0.81	22.8
Approach		903	6.2	0.669	38.0	LOS C	19.9	140.2	0.91	0.80	24.0
All Vehicles		3086	4.3	0.678	24.3	LOS B	24.3	171.8	0.67	0.64	33.8

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped	
P4	West Full Crossing	171	37.1	LOS D	0.5	0.5	0.79	0.79	
P8	SouthWest Full Crossing	68	54.3	LOS E	0.2	0.2	0.95	0.95	
P8S	SouthWest Slip/Bypass Lane Crossing	171	0.5	LOS A	0.0	0.0	0.13	0.13	
All Pedestrians		409	24.7	LOS C			0.54	0.54	

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.

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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160906sid-N106360 Additional Intersections - Existing.sip6

SITE LAYOUT

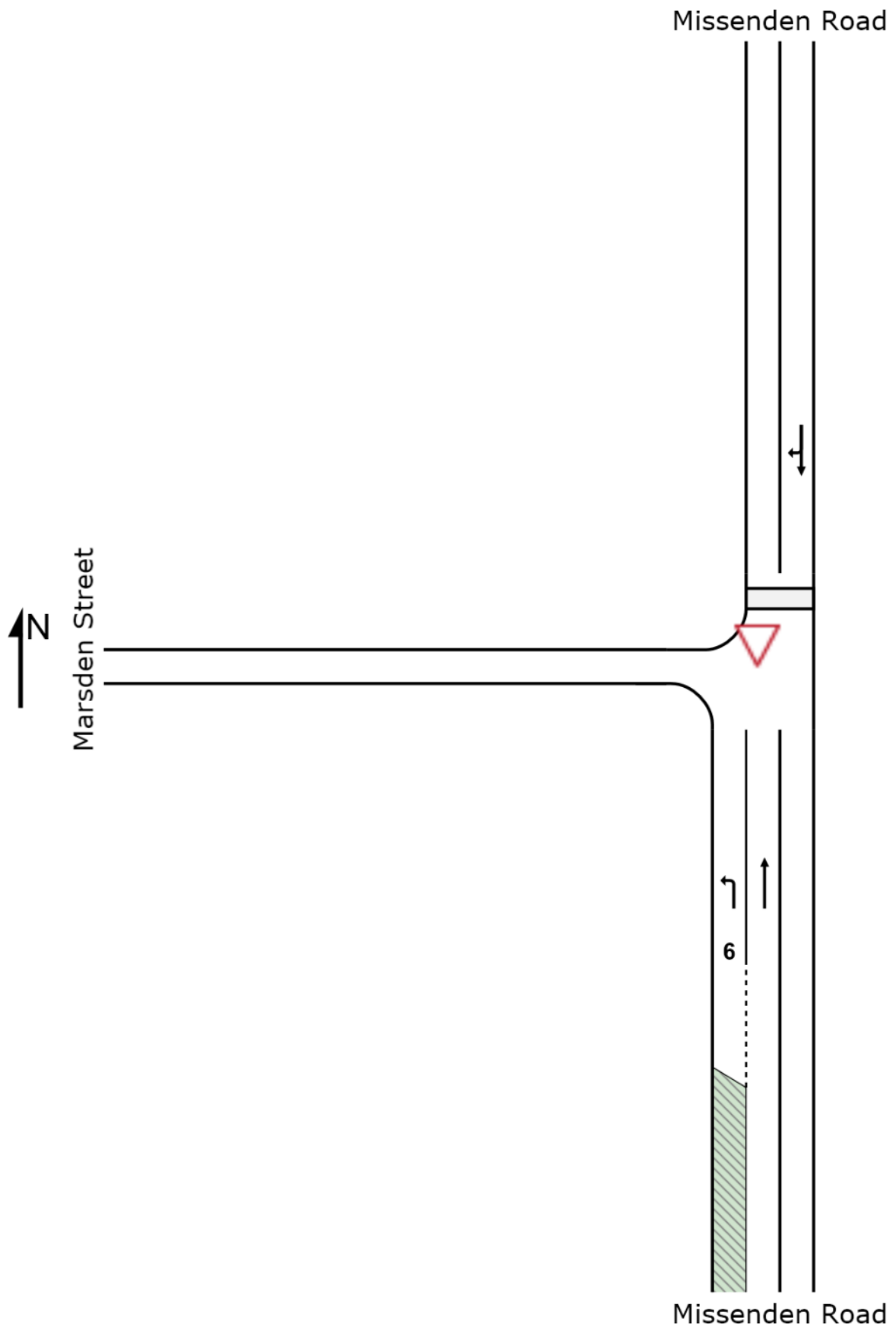
▽ Site: AM - PRE - Missenden Road and Marsden Street

N105960

Lucas Street Car Park, Campderdown

Existing AM Peak

Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

▽ Site: AM - PRE - Missenden Road and Marsden Street

N105960

Lucas Street Car Park, Campderdown

Existing AM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Missenden Road											
1	L2	27	7.7	0.016	5.6	LOS A	0.0	0.0	0.00	0.57	50.6
2	T1	348	6.6	0.186	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		376	6.7	0.186	0.4	NA	0.0	0.0	0.00	0.04	59.0
North: Missenden Road											
8	T1	493	4.7	0.286	0.2	LOS A	0.3	2.1	0.06	0.03	59.0
9	R2	24	0.0	0.286	8.2	LOS A	0.3	2.1	0.06	0.03	51.1
Approach		517	4.5	0.286	0.6	NA	0.3	2.1	0.06	0.03	58.8
All Vehicles		893	5.4	0.286	0.5	NA	0.3	2.1	0.03	0.04	58.9

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160906sid-N106360 Additional Intersections - Existing.sip6

MOVEMENT SUMMARY

▽ Site: PM - PRE - Missenden Road and Marsden Street

N105960

Lucas Street Car Park, Camperdown

Existing PM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Missenden Road											
1	L2	29	0.0	0.016	5.5	LOS A	0.0	0.0	0.00	0.58	51.3
2	T1	444	2.1	0.231	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		474	2.0	0.231	0.4	NA	0.0	0.0	0.00	0.04	59.2
North: Missenden Road											
8	T1	483	2.4	0.319	0.7	LOS A	0.8	5.9	0.16	0.08	57.4
9	R2	57	0.0	0.319	9.1	LOS A	0.8	5.9	0.16	0.08	48.8
Approach		540	2.1	0.319	1.6	NA	0.8	5.9	0.16	0.08	56.9
All Vehicles		1014	2.1	0.319	1.0	NA	0.8	5.9	0.09	0.06	58.0

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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SITE LAYOUT

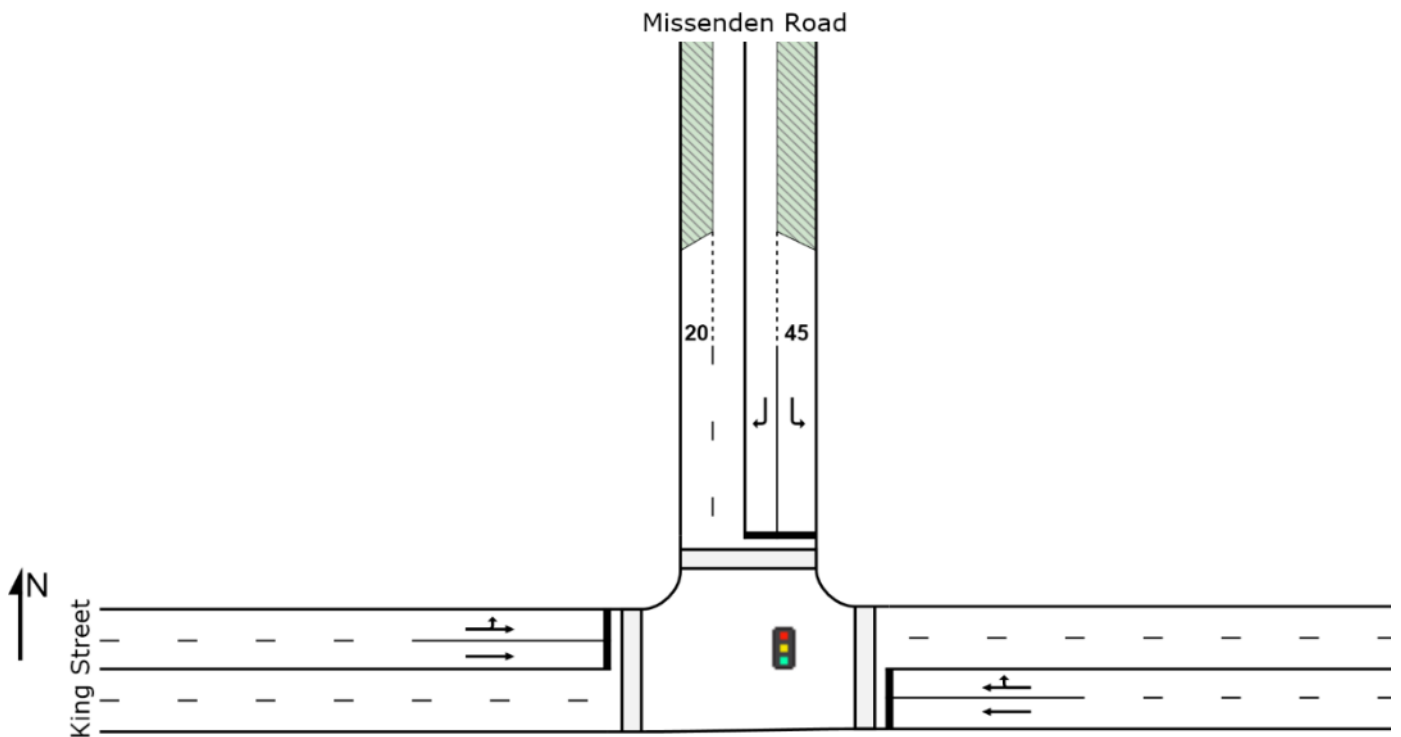
 **Site: AM - PRE - Missenden Road and King Street**

N105960

Lucas Street Car Park, Camperdown

Existing AM Peak

Signals - Fixed Time Isolated



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MOVEMENT SUMMARY

 **Site: AM - PRE - Missenden Road and King Street**

N105960

Lucas Street Car Park, Camperdown

Existing AM Peak

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: King Street											
5	T1	475	13.7	0.358	5.7	LOS A	9.6	74.8	0.38	0.34	54.8
6	R2	66	3.2	0.370	37.7	LOS C	3.3	23.7	0.86	0.80	36.4
Approach		541	12.5	0.370	9.7	LOS A	9.6	74.8	0.44	0.40	51.6
North: Missenden Road											
7	L2	43	2.4	0.088	41.6	LOS C	1.9	13.6	0.79	0.72	35.0
9	R2	205	5.6	0.736	60.5	LOS E	12.1	88.5	1.00	0.86	29.6
Approach		248	5.1	0.736	57.2	LOS E	12.1	88.5	0.96	0.84	30.4
West: King Street											
10	L2	372	20.4	0.742	20.0	LOS B	30.0	233.0	0.68	0.71	45.8
11	T1	1373	2.7	0.742	15.1	LOS B	35.9	252.5	0.72	0.70	47.6
Approach		1744	6.5	0.742	16.2	LOS B	35.9	252.5	0.71	0.70	47.2
All Vehicles		2534	7.6	0.742	18.8	LOS B	35.9	252.5	0.68	0.65	45.6

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped	
P2	East Full Crossing	131	51.6	LOS E	0.4	0.4	0.93	0.93	
P3	North Full Crossing	52	12.2	LOS B	0.1	0.1	0.45	0.45	
P4	West Full Crossing	116	51.6	LOS E	0.4	0.4	0.93	0.93	
All Pedestrians		298	44.8	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.

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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160904sid-N106360 Additional Intersections - Existing.sip6

MOVEMENT SUMMARY

 **Site: PM - PRE - Missenden Road and King Street**

N105960

Lucas Street Car Park, Camperdown

Existing PM Peak

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: King Street											
5	T1	968	1.5	0.650	16.8	LOS B	28.4	201.3	0.70	0.66	46.8
6	R2	174	23.6	0.650	40.6	LOS C	15.8	123.4	0.93	0.95	36.5
Approach		1142	4.9	0.650	20.4	LOS B	28.4	201.3	0.74	0.70	44.9
North: Missenden Road											
7	L2	46	0.0	0.051	23.3	LOS B	1.4	10.0	0.56	0.69	42.5
9	R2	279	3.8	0.643	48.9	LOS D	14.6	105.6	0.94	0.83	32.7
Approach		325	3.2	0.643	45.3	LOS D	14.6	105.6	0.89	0.81	33.8
West: King Street											
10	L2	245	1.7	0.653	33.8	LOS C	21.9	168.5	0.83	0.79	38.9
11	T1	772	8.2	0.653	29.0	LOS C	24.3	172.9	0.85	0.77	40.2
Approach		1017	6.6	0.653	30.2	LOS C	24.3	172.9	0.84	0.77	39.9
All Vehicles		2484	5.4	0.653	27.7	LOS B	28.4	201.3	0.80	0.75	41.0

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P2	East Full Crossing	254	42.1	LOS E	0.7	0.7	0.84	0.84
P3	North Full Crossing	271	27.0	LOS C	0.6	0.6	0.67	0.67
P4	West Full Crossing	284	42.2	LOS E	0.8	0.8	0.84	0.84
All Pedestrians		808	37.1	LOS D			0.79	0.79

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.

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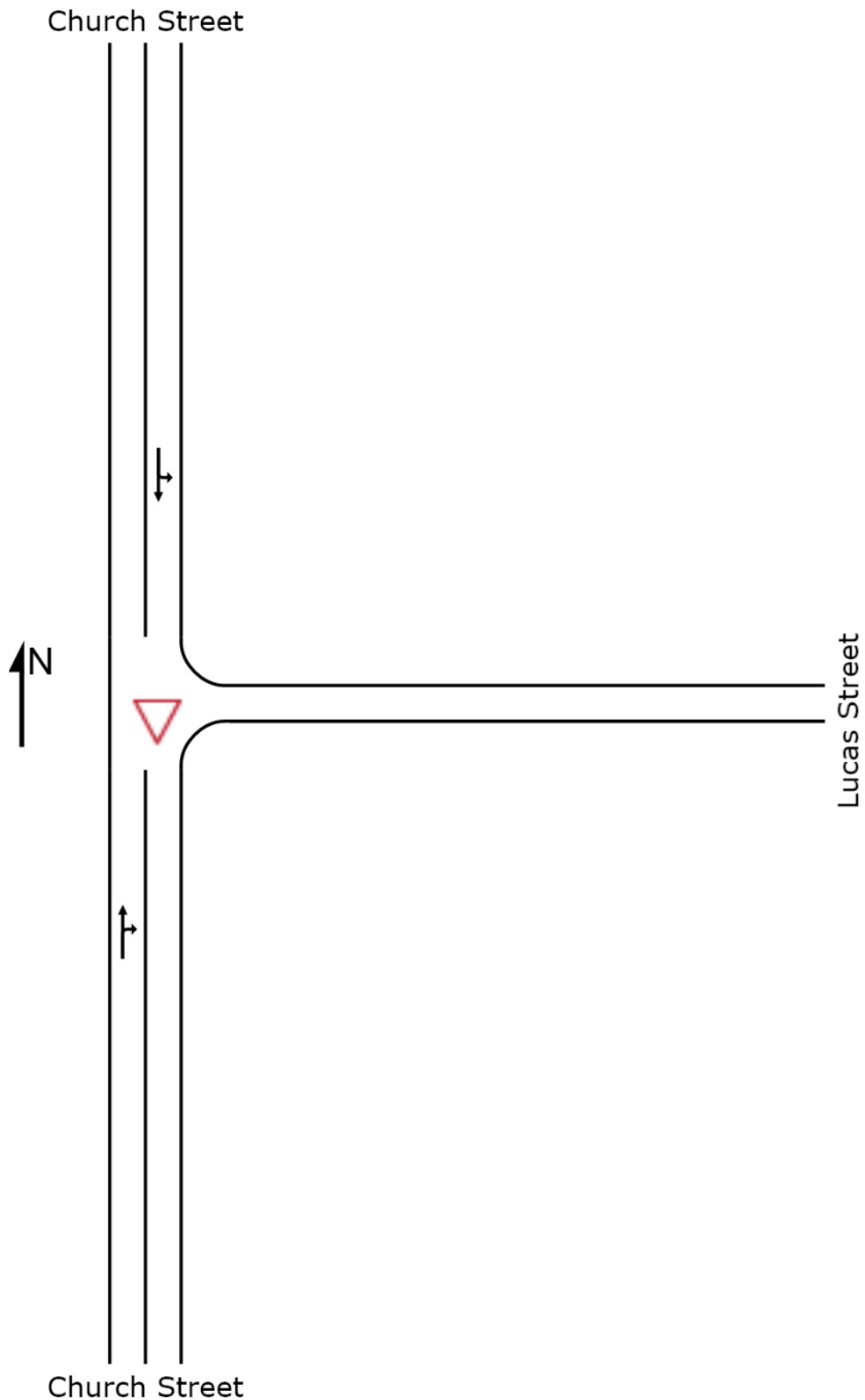
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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160904sid-N106360 Additional Intersections - Existing.sip6

SITE LAYOUT

▽ Site: AM - POST - Church St and Lucas St

Three-way intersection with 2-lane major road (Stop control)
Giveaway / Yield (Two-Way)



MOVEMENT SUMMARY

▽ Site: AM - POST - Church St and Lucas St

Three-way intersection with 2-lane major road (Stop control)
Giveaway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows 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: Church Street											
11	T1	99	2.0	0.076	0.2	LOS A	0.2	1.6	0.15	0.17	57.9
12	R2	37	0.0	0.076	6.2	LOS A	0.2	1.6	0.15	0.17	55.6
Approach		136	1.5	0.076	1.8	NA	0.2	1.6	0.15	0.17	57.3
North: Church Street											
4	L2	24	0.0	0.080	5.5	LOS A	0.0	0.0	0.00	0.09	57.5
5	T1	130	1.5	0.080	0.0	LOS A	0.0	0.0	0.00	0.09	59.1
Approach		154	1.3	0.080	0.9	NA	0.0	0.0	0.00	0.09	58.9
All Vehicles		290	1.4	0.080	1.3	NA	0.2	1.6	0.07	0.13	58.1

Level of Service (LOS) Method: Delay (RTA NSW).
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.

MOVEMENT SUMMARY

▽ Site: PM - POST - Church St and Lucas St

Three-way intersection with 2-lane major road (Stop control)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Church Street											
11	T1	195	0.0	0.110	0.0	LOS A	0.1	0.8	0.04	0.05	59.4
12	R2	16	1.7	0.110	6.1	LOS A	0.1	0.8	0.04	0.05	56.9
Approach		211	0.1	0.110	0.5	NA	0.1	0.8	0.04	0.05	59.2
North: Church Street											
4	L2	10	0.0	0.062	5.5	LOS A	0.0	0.0	0.00	0.05	57.9
5	T1	110	0.9	0.062	0.0	LOS A	0.0	0.0	0.00	0.05	59.5
Approach		120	0.8	0.062	0.5	NA	0.0	0.0	0.00	0.05	59.4
All Vehicles		331	0.4	0.110	0.5	NA	0.1	0.8	0.03	0.05	59.3

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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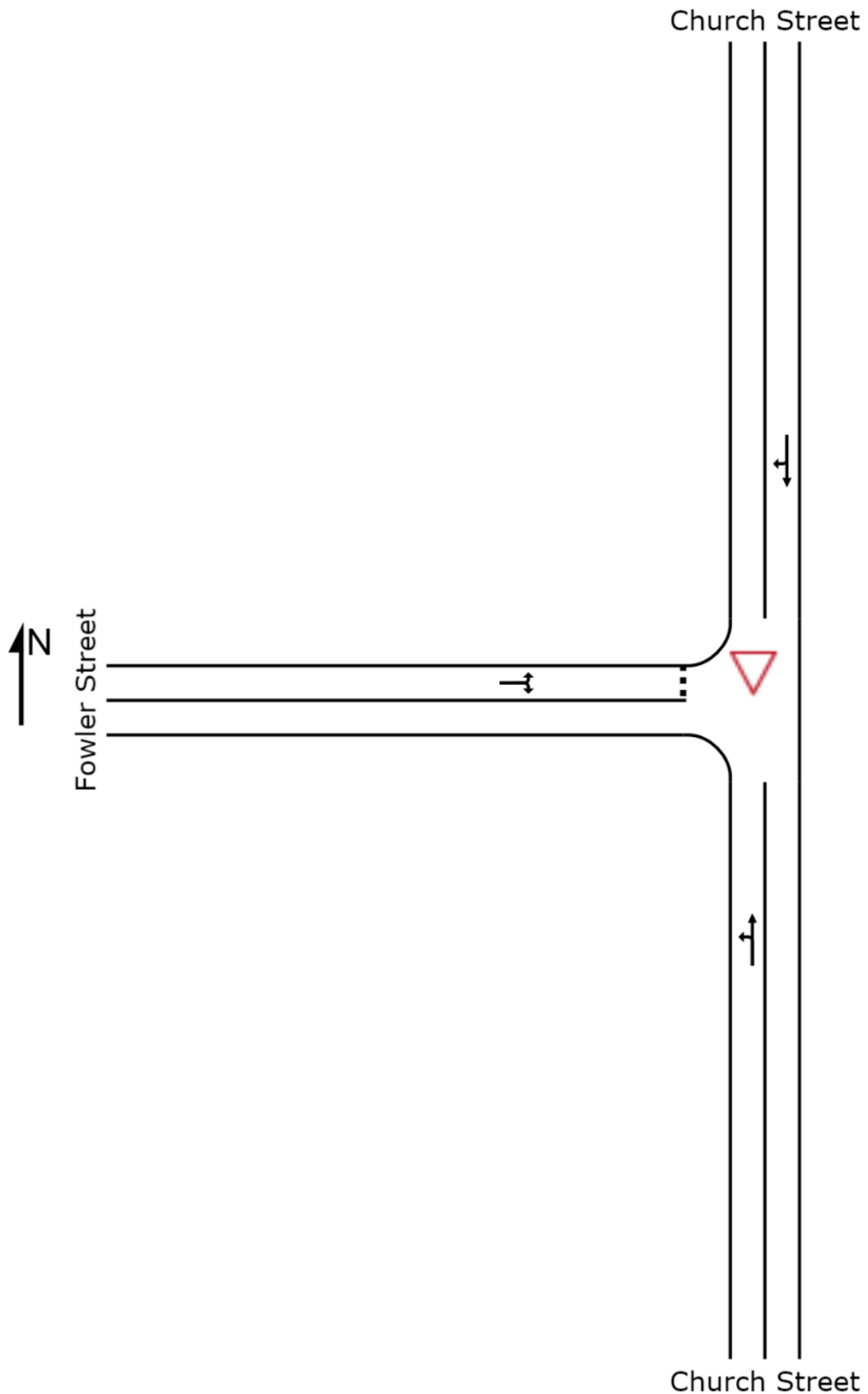
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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Reports & Advice\Appendix A\160831_16S1251000_SITE 1_Lucas St & Church St(AM-POST).sip6

SITE LAYOUT

Site: AM - POST - Church St and Fowler St

Three-way intersection with 2-lane major road (Stop control)
Giveaway / Yield (Two-Way)



MOVEMENT SUMMARY

▽ Site: AM - POST - Church St and Fowler St

Three-way intersection with 2-lane major road (Stop control)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Church Street											
4	L2	11	0.0	0.035	5.5	LOS A	0.0	0.0	0.00	0.10	57.5
5	T1	56	1.8	0.035	0.0	LOS A	0.0	0.0	0.00	0.10	59.1
Approach		67	1.5	0.035	0.9	NA	0.0	0.0	0.00	0.10	58.8
North: Church Street											
11	T1	111	0.0	0.088	0.1	LOS A	0.3	2.0	0.11	0.18	58.0
12	R2	49	4.1	0.088	5.7	LOS A	0.3	2.0	0.11	0.18	55.7
Approach		160	1.3	0.088	1.8	NA	0.3	2.0	0.11	0.18	57.3
West: Fowler Street											
1	L2	67	1.5	0.057	5.7	LOS A	0.2	1.6	0.13	0.55	53.2
3	R2	14	7.1	0.057	6.4	LOS A	0.2	1.6	0.13	0.55	52.4
Approach		81	2.5	0.057	5.8	LOS A	0.2	1.6	0.13	0.55	53.0
All Vehicles		308	1.6	0.088	2.7	NA	0.3	2.0	0.09	0.26	56.4

Level of Service (LOS) Method: Delay (RTA NSW).
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.

MOVEMENT SUMMARY

▽ Site: PM - POST - Church St and Fowler St

Three-way intersection with 2-lane major road (Stop control)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Church Street											
4	L2	24	0.0	0.066	5.5	LOS A	0.0	0.0	0.00	57.4	
5	T1	103	1.0	0.066	0.0	LOS A	0.0	0.0	0.00	59.0	
Approach		127	0.8	0.066	1.1	NA	0.0	0.0	0.00	58.7	
North: Church Street											
11	T1	87	0.0	0.138	0.4	LOS A	0.7	4.8	0.24	56.0	
12	R2	148	0.7	0.138	5.9	LOS A	0.7	4.8	0.24	54.0	
Approach		235	0.4	0.138	3.8	NA	0.7	4.8	0.24	54.7	
West: Fowler Street											
1	L2	28	0.0	0.021	5.8	LOS A	0.1	0.6	0.19	53.0	
3	R2	2	0.0	0.021	6.8	LOS A	0.1	0.6	0.19	52.5	
Approach		30	0.0	0.021	5.9	LOS A	0.1	0.6	0.19	53.0	
All Vehicles		392	0.5	0.138	3.1	NA	0.7	4.8	0.16	55.8	

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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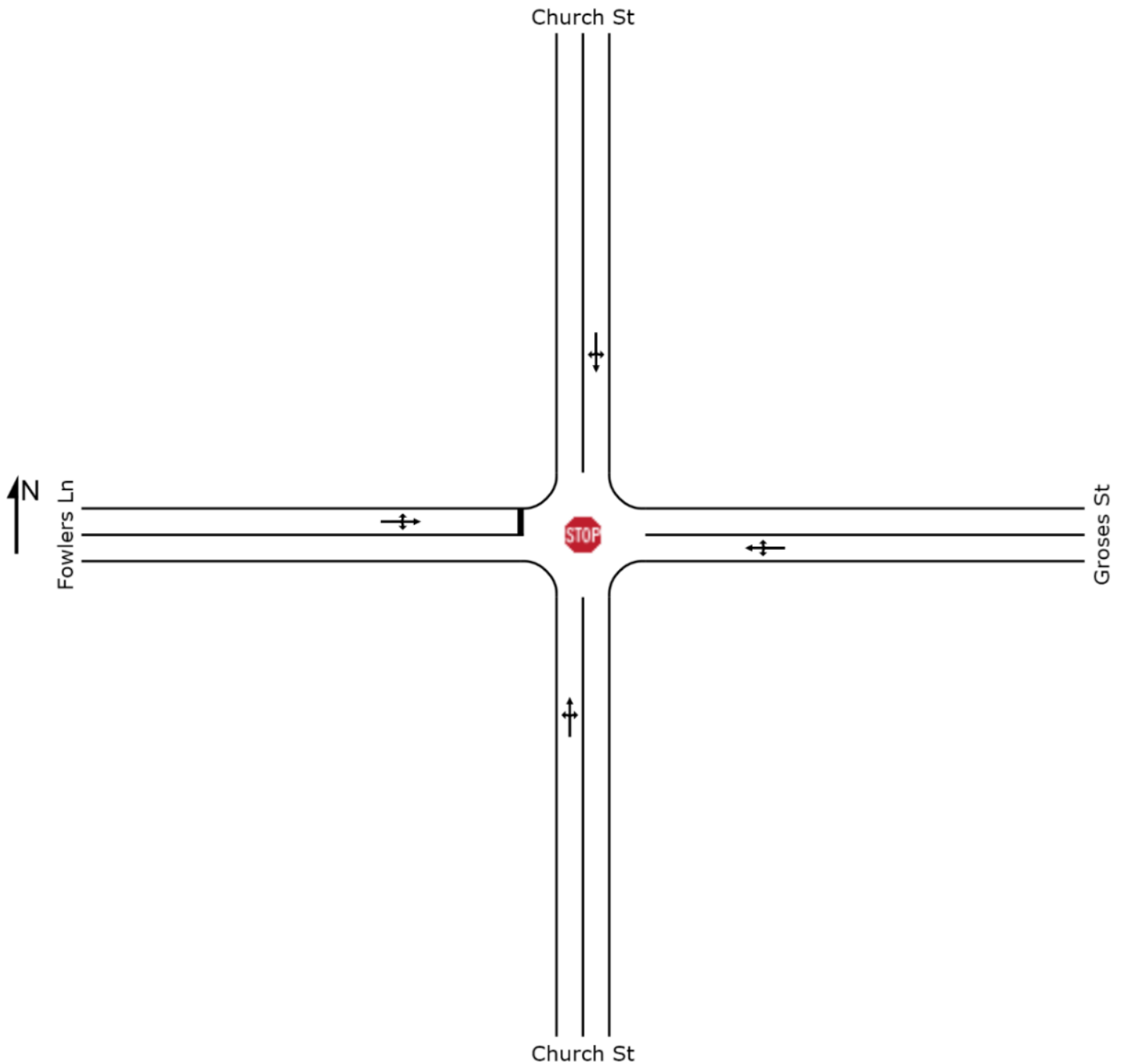
Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment\160831_16S1251000_SITE 2_Fowler St & Church St.sip6

SITE LAYOUT

 **Site: AM - POST - Church St, Grose St and Fowler Ln**

Four-way intersection with 2-lane major road (Stop control)

Stop (Two-Way)



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MOVEMENT SUMMARY

 **Site: AM - POST - Church St, Grose St and Fowler Ln**

Four-way intersection with 2-lane major road (Stop control)

Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Church St											
1	L2	8	0.0	0.059	5.5	LOS A	0.3	2.0	0.01	0.07	57.7
2	T1	63	1.6	0.059	0.0	LOS A	0.3	2.0	0.01	0.07	59.3
3	R2	1	0.0	0.059	5.9	LOS A	0.3	2.0	0.01	0.07	57.1
Approach		72	1.4	0.059	0.7	NA	0.3	2.0	0.01	0.07	59.1
East: Grose St											
4	L2	1	100.0	0.007	7.0	LOS A	0.0	0.2	0.27	0.50	51.3
5	T1	1	0.0	0.007	0.7	LOS A	0.0	0.2	0.27	0.50	54.8
6	R2	6	0.0	0.007	6.1	LOS A	0.0	0.2	0.27	0.50	52.9
Approach		8	12.5	0.007	5.7	NA	0.0	0.2	0.27	0.50	52.9
North: Church St											
7	L2	1	0.0	0.067	5.8	LOS A	0.1	0.6	0.04	0.06	57.7
8	T1	113	0.9	0.067	0.0	LOS A	0.1	0.6	0.04	0.06	59.3
9	R2	11	0.0	0.067	5.7	LOS A	0.1	0.6	0.04	0.06	57.1
Approach		125	0.8	0.067	0.6	NA	0.1	0.6	0.04	0.06	59.1
West: Fowlers Ln											
10	L2	1	0.0	0.003	8.2	LOS A	0.0	0.1	0.24	0.88	51.6
11	T1	1	0.0	0.003	8.9	LOS A	0.0	0.1	0.24	0.88	51.3
12	R2	1	0.0	0.003	8.9	LOS A	0.0	0.1	0.24	0.88	51.1
Approach		3	0.0	0.003	8.7	LOS A	0.0	0.1	0.24	0.88	51.3
All Vehicles		208	1.4	0.067	0.9	NA	0.3	2.0	0.04	0.09	58.7

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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MOVEMENT SUMMARY

 **Site: PM - POST - Church St, Grose St and Fowler Ln**

Four-way intersection with 2-lane major road (Stop control)

Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Church St											
1	L2	1	0.0	0.043	5.7	LOS A	0.2	1.4	0.13	0.06	57.6
2	T1	47	2.1	0.043	0.2	LOS A	0.2	1.4	0.13	0.06	59.2
3	R2	1	0.0	0.043	6.2	LOS A	0.2	1.4	0.13	0.06	57.0
Approach		49	2.0	0.043	0.4	NA	0.2	1.4	0.13	0.06	59.1
East: Grose St											
4	L2	4	0.0	0.096	5.9	LOS A	0.4	2.9	0.24	0.45	54.2
5	T1	33	0.0	0.096	0.6	LOS A	0.4	2.9	0.24	0.45	55.6
6	R2	79	0.0	0.096	6.0	LOS A	0.4	2.9	0.24	0.45	53.6
Approach		116	0.0	0.096	4.4	NA	0.4	2.9	0.24	0.45	54.2
North: Church St											
7	L2	1	0.0	0.045	5.8	LOS A	0.0	0.1	0.01	0.02	58.1
8	T1	83	0.0	0.045	0.0	LOS A	0.0	0.1	0.01	0.02	59.8
9	R2	2	0.0	0.045	5.7	LOS A	0.0	0.1	0.01	0.02	57.5
Approach		86	0.0	0.045	0.2	NA	0.0	0.1	0.01	0.02	59.7
West: Fowlers Ln											
10	L2	1	0.0	0.003	8.4	LOS A	0.0	0.1	0.29	0.85	51.7
11	T1	1	0.0	0.003	9.0	LOS A	0.0	0.1	0.29	0.85	51.4
12	R2	1	0.0	0.003	8.7	LOS A	0.0	0.1	0.29	0.85	51.2
Approach		3	0.0	0.003	8.7	LOS A	0.0	0.1	0.29	0.85	51.4
All Vehicles		254	0.4	0.096	2.3	NA	0.4	2.9	0.14	0.23	56.8

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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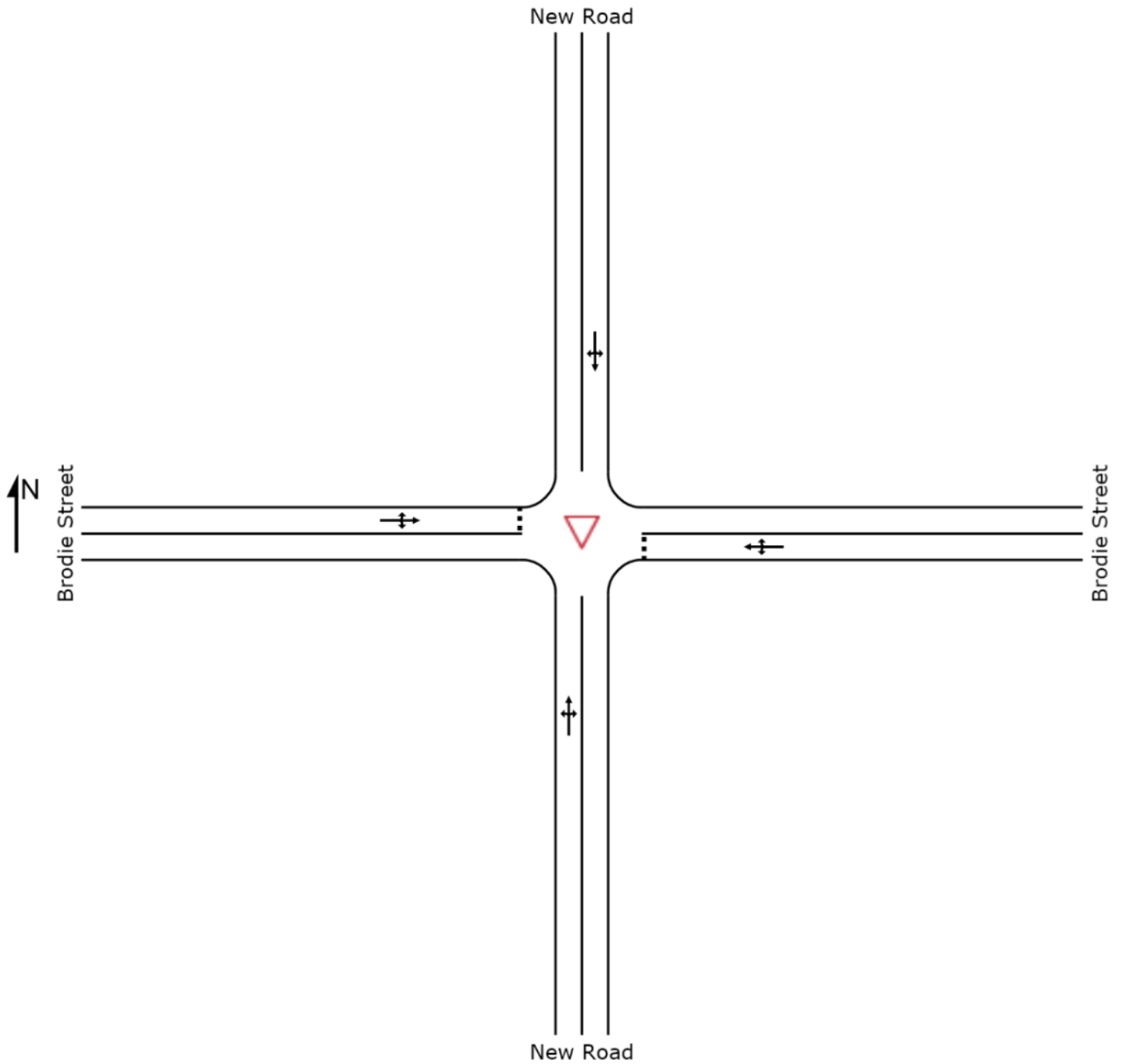
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SITE LAYOUT

▽ Site: AM - POST - New Rd and Brodie St

New Site

Giveway / Yield (Two-Way)



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\160831sidra16S1251000_SITE 4_New Road & Brodie St.sip6

MOVEMENT SUMMARY

 **Site: AM - POST - New Rd and Brodie St**

New Site

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: New Road											
1	L2	481	0.0	0.260	5.5	LOS A	0.0	0.1	0.00	0.57	53.6
2	T1	1	0.0	0.260	0.0	LOS A	0.0	0.1	0.00	0.57	55.0
3	R2	1	0.0	0.260	5.4	LOS A	0.0	0.1	0.00	0.57	53.1
Approach		483	0.0	0.260	5.5	NA	0.0	0.1	0.00	0.57	53.6
East: Brodie Street											
4	L2	19	0.0	0.034	5.5	LOS A	0.1	0.9	0.00	0.58	53.4
5	T1	7	14.3	0.034	7.1	LOS A	0.1	0.9	0.00	0.58	53.0
6	R2	13	16.7	0.034	5.7	LOS A	0.1	0.9	0.00	0.58	52.1
Approach		39	8.1	0.034	5.9	LOS A	0.1	0.9	0.00	0.58	52.9
North: New Road											
7	L2	1	0.0	0.002	6.8	LOS A	0.0	0.1	0.39	0.31	53.9
8	T1	1	0.0	0.002	1.2	LOS A	0.0	0.1	0.39	0.31	55.2
9	R2	1	0.0	0.002	7.1	LOS A	0.0	0.1	0.39	0.31	53.3
Approach		3	0.0	0.002	5.0	NA	0.0	0.1	0.39	0.31	54.1
West: Brodie Street											
10	L2	2	0.0	0.012	5.5	LOS A	0.0	0.3	0.01	0.59	53.0
11	T1	1	0.0	0.012	5.1	LOS A	0.0	0.3	0.01	0.59	53.1
12	R2	8	0.0	0.012	6.8	LOS A	0.0	0.3	0.01	0.59	52.4
Approach		12	0.0	0.012	6.4	LOS A	0.0	0.3	0.01	0.59	52.6
All Vehicles		537	0.6	0.260	5.6	NA	0.1	0.9	0.00	0.57	53.6

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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 \160831sidra16S1251000_SITE 4_New Road & Brodie St.sip6

MOVEMENT SUMMARY

 **Site: PM - POST - New Rd and Brodie St**

New Site

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: New Road											
1	L2	298	0.0	0.172	5.5	LOS A	0.0	0.1	0.00	0.54	53.9
2	T1	22	0.0	0.172	0.0	LOS A	0.0	0.1	0.00	0.54	55.3
3	R2	1	0.0	0.172	5.4	LOS A	0.0	0.1	0.00	0.54	53.4
Approach		321	0.0	0.172	5.2	NA	0.0	0.1	0.00	0.54	54.0
East: Brodie Street											
4	L2	12	0.0	0.016	5.5	LOS A	0.1	0.4	0.00	0.56	53.6
5	T1	7	0.0	0.016	5.5	LOS A	0.1	0.4	0.00	0.56	53.8
6	R2	1	0.0	0.016	5.6	LOS A	0.1	0.4	0.00	0.56	53.1
Approach		20	0.0	0.016	5.5	LOS A	0.1	0.4	0.00	0.56	53.7
North: New Road											
7	L2	1	0.0	0.002	6.2	LOS A	0.0	0.1	0.31	0.32	54.1
8	T1	1	0.0	0.002	0.7	LOS A	0.0	0.1	0.31	0.32	55.5
9	R2	1	0.0	0.002	6.4	LOS A	0.0	0.1	0.31	0.32	53.6
Approach		3	0.0	0.002	4.4	NA	0.0	0.1	0.31	0.32	54.4
West: Brodie Street											
10	L2	7	0.0	0.021	5.6	LOS A	0.1	0.5	0.10	0.57	53.2
11	T1	1	0.0	0.021	4.8	LOS A	0.1	0.5	0.10	0.57	53.4
12	R2	15	0.0	0.021	6.3	LOS A	0.1	0.5	0.10	0.57	52.7
Approach		23	0.0	0.021	6.0	LOS A	0.1	0.5	0.10	0.57	52.9
All Vehicles		367	0.0	0.172	5.2	NA	0.1	0.5	0.01	0.54	53.9

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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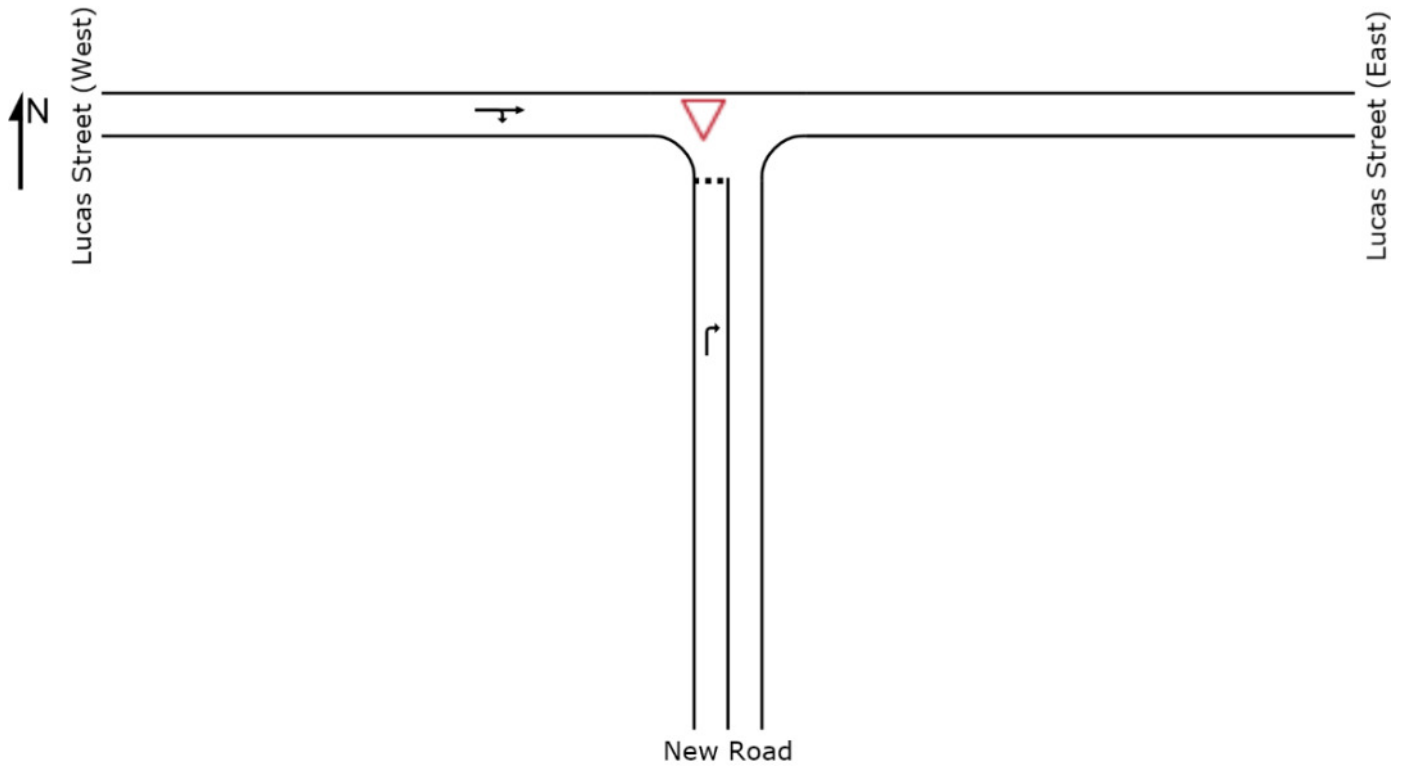
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 \160831sidra16S1251000_SITE 4_New Road & Brodie St.sip6

SITE LAYOUT

▽ Site: AM - POST - Lucas St and RPA Access

New Site

Giveaway / Yield (Two-Way)



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MOVEMENT SUMMARY

▽ Site: AM - POST - Lucas St and RPA Access

New Site

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		Total veh/h	HV %	v/c	sec		Vehicles veh	m		per veh	km/h
South: New Road											
3	R2	15	14.3	0.012	6.0	LOS A	0.0	0.3	0.14	0.58	51.9
Approach		15	14.3	0.012	6.0	LOS A	0.0	0.3	0.14	0.58	51.9
West: Lucas Street (West)											
11	T1	72	0.0	0.036	0.0	LOS A	0.0	0.0	0.00	0.02	59.8
12	R2	2	0.0	0.036	5.7	LOS A	0.0	0.0	0.00	0.02	57.4
Approach		74	0.0	0.036	0.2	NA	0.0	0.0	0.00	0.02	59.8
All Vehicles		88	2.4	0.036	1.1	NA	0.0	0.3	0.02	0.11	58.3

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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\160831sidra16S1251000_SITE 5_Lucas St & RPA Access.sip6

MOVEMENT SUMMARY

▽ Site: PM - POST - Lucas St and RPA Access

New Site

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: New Road											
3	R2	31	0.0	0.023	5.8	LOS A	0.1	0.5	0.14	0.58	52.6
Approach		31	0.0	0.023	5.8	LOS A	0.1	0.5	0.14	0.58	52.6
West: Lucas Street (West)											
11	T1	83	0.0	0.041	0.0	LOS A	0.0	0.0	0.00	0.01	59.9
12	R2	1	0.0	0.041	5.7	LOS A	0.0	0.0	0.00	0.01	57.5
Approach		84	0.0	0.041	0.1	NA	0.0	0.0	0.00	0.01	59.9
All Vehicles		115	0.0	0.041	1.6	NA	0.1	0.5	0.04	0.16	57.7

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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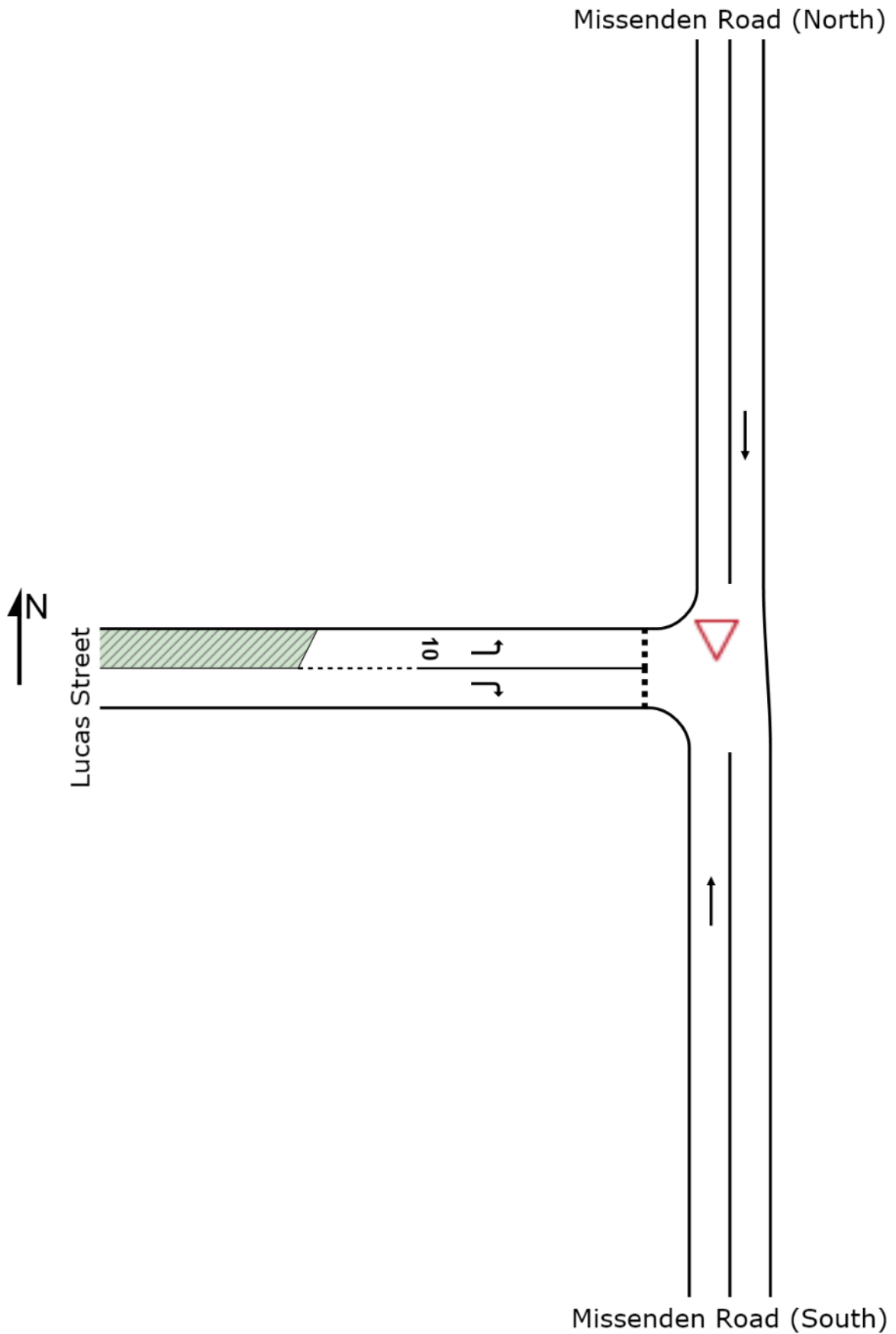
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\160831sidra16S1251000_SITE 5_Lucas St & RPA Access.sip6

SITE LAYOUT

▽ Site: AM - POST - Lucas St and Missenden Rd

New Site

Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

▽ Site: AM - POST - Lucas St and Missenden Rd

New Site

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Missenden Road (South)											
2	T1	349	4.2	0.177	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		349	4.2	0.177	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: Missenden Road (North)											
8	T1	482	4.4	0.253	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		482	4.4	0.253	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: Lucas Street											
10	L2	43	0.0	0.037	6.7	LOS A	0.1	1.0	0.39	0.61	52.4
12	R2	22	4.8	0.044	10.6	LOS A	0.1	1.0	0.61	0.83	49.2
Approach		65	1.6	0.044	8.0	LOS A	0.1	1.0	0.47	0.68	51.3
All Vehicles		897	4.1	0.253	0.6	NA	0.1	1.0	0.03	0.05	59.2

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
\160831sidra16S1251000_SITE 6_Lucas Street and Missenden Road.sip6

MOVEMENT SUMMARY

▽ Site: PM - POST - Lucas St and Missenden Rd

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued Distance m	Effective Stop Rate per veh	Average Speed km/h	
South: Missenden Road (South)											
2	T1	459	3.0	0.230	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		459	3.0	0.230	0.0	NA	0.0	0.0	0.00	0.00	60.0
North: Missenden Road (North)											
8	T1	512	2.9	0.266	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		512	2.9	0.266	0.0	NA	0.0	0.0	0.00	0.00	59.9
West: Lucas Street											
10	L2	95	0.0	0.091	7.4	LOS A	0.4	2.5	0.47	0.68	52.2
12	R2	39	5.4	0.093	12.3	LOS A	0.3	2.1	0.69	0.88	48.1
Approach		134	1.6	0.093	8.8	LOS A	0.4	2.5	0.53	0.74	50.9
All Vehicles		1104	2.8	0.266	1.1	NA	0.4	2.5	0.06	0.09	58.7

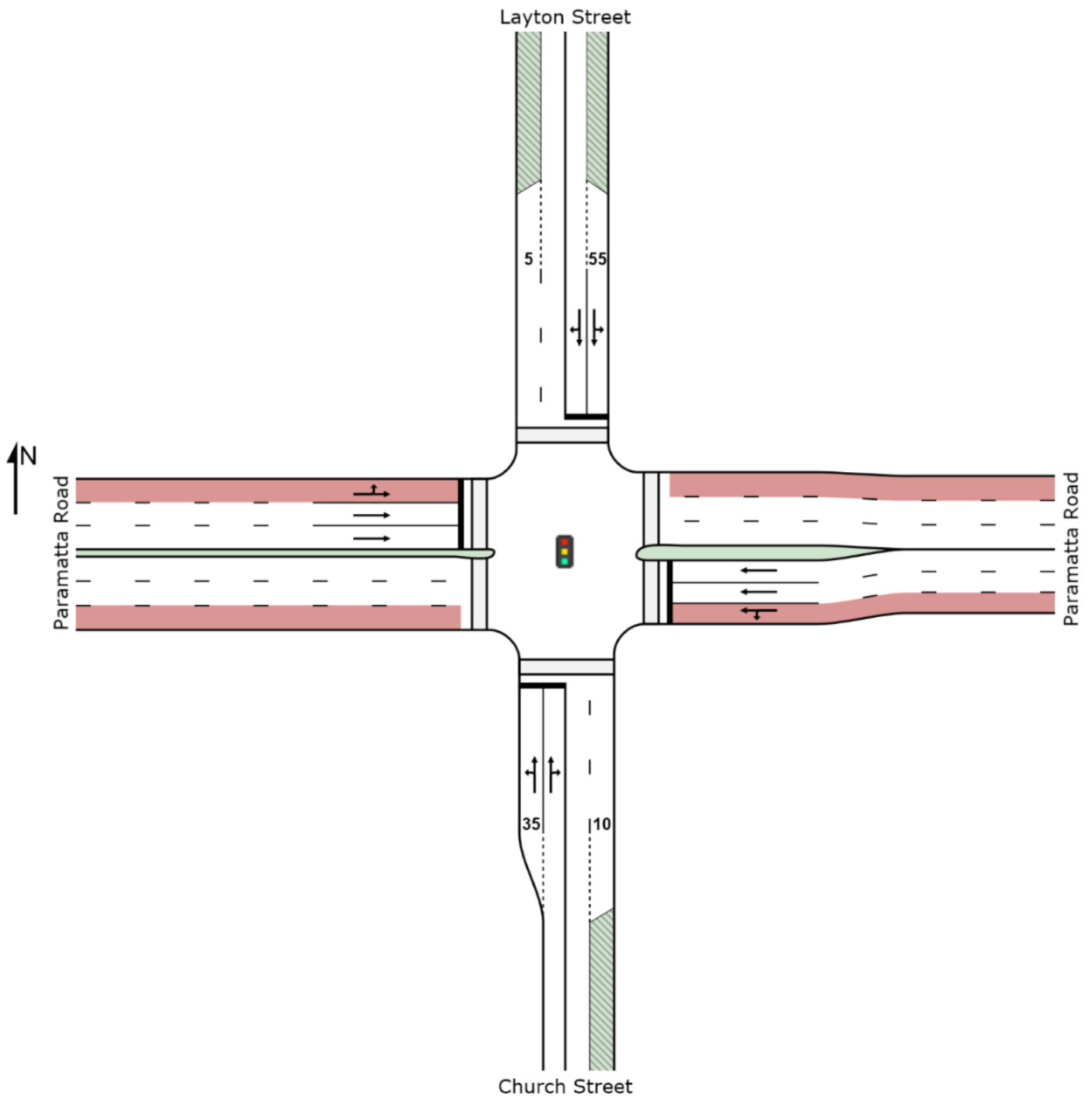
Level of Service (LOS) Method: Delay (RTA NSW).
Vehicle movement LOS values are based on average delay per movement
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control 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.

SITE LAYOUT

 **Site: AM - POST - Church St, Layton St & Paramatta Rd**

New Site

Signals - Fixed Time Coordinated



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Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment\160831_16S1251000_SITE 7_Paramatta Rd & Layton Rd & Church St.sip6

MOVEMENT SUMMARY

 **Site: AM - POST - Church St, Layton St & Paramatta Rd**

New Site
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Church Street											
1	L2	26	0.0	0.135	58.6	LOS E	2.5	17.8	0.88	0.71	30.7
2	T1	17	5.9	0.135	53.0	LOS D	2.5	17.8	0.88	0.71	31.2
3	R2	62	6.5	0.293	63.9	LOS E	3.9	28.5	0.93	0.76	28.9
Approach		105	4.8	0.293	60.8	LOS E	3.9	28.5	0.91	0.74	29.7
East: Paramatta Road											
4	L2	46	6.5	0.062	6.0	LOS A	0.1	0.9	0.02	0.31	54.8
5	T1	965	6.4	0.342	0.5	LOS A	0.9	6.9	0.03	0.04	59.4
Approach		1011	6.4	0.342	0.7	LOS A	0.9	6.9	0.03	0.05	59.2
North: Layton Street											
7	L2	17	23.5	0.164	59.3	LOS E	2.9	21.7	0.89	0.70	30.8
8	T1	63	0.0	0.164	53.6	LOS D	2.9	21.7	0.89	0.70	31.6
9	R2	15	6.7	0.164	59.3	LOS E	2.7	19.0	0.89	0.70	31.0
Approach		95	5.3	0.164	55.5	LOS D	2.9	21.7	0.89	0.70	31.3
West: Paramatta Road											
10	L2	13	7.7	0.060	6.0	LOS A	0.1	0.9	0.02	0.09	56.9
11	T1	2020	6.6	0.708	0.8	LOS A	4.3	31.3	0.07	0.07	59.2
Approach		2033	6.6	0.708	0.8	LOS A	4.3	31.3	0.07	0.07	59.2
All Vehicles		3244	6.4	0.708	4.3	LOS A	4.3	31.3	0.11	0.10	55.9

Level of Service (LOS) Method: Delay (RTA NSW).
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.

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	
P1	South Full Crossing	26	7.6	LOS A	0.0	0.0	0.33	0.33	
P2	East Full Crossing	16	62.3	LOS F	0.1	0.1	0.94	0.94	
P3	North Full Crossing	51	7.2	LOS A	0.1	0.1	0.32	0.32	
P4	West Full Crossing	55	62.4	LOS F	0.2	0.2	0.95	0.95	
All Pedestrians		148	33.7	LOS D			0.62	0.62	

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: PM - POST - Church St, Layton St & Paramatta Rd**

New Site
Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)
Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Prop. Queued Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Church Street											
1	L2	92	0.0	0.450	62.1	LOS E	8.9	62.5	0.95	0.79	29.8
2	T1	55	1.8	0.450	56.8	LOS E	8.9	62.5	0.95	0.79	30.1
3	R2	90	4.4	0.450	65.7	LOS E	6.0	43.5	0.96	0.79	28.6
Approach		237	2.1	0.450	62.2	LOS E	8.9	62.5	0.95	0.79	29.4
East: Paramatta Road											
4	L2	39	7.7	0.056	6.0	LOS A	0.1	0.8	0.02	0.29	54.9
5	T1	1808	3.4	0.639	0.7	LOS A	3.2	22.8	0.06	0.06	59.3
Approach		1847	3.5	0.639	0.8	LOS A	3.2	22.8	0.06	0.06	59.2
North: Layton Street											
7	L2	19	21.1	0.214	59.8	LOS E	3.9	28.7	0.90	0.71	30.8
8	T1	47	0.0	0.214	54.0	LOS D	3.9	28.7	0.90	0.71	31.5
9	R2	36	2.8	0.236	69.4	LOS E	2.3	16.7	0.95	0.74	27.8
Approach		102	4.9	0.236	60.5	LOS E	3.9	28.7	0.92	0.72	30.0
West: Paramatta Road											
10	L2	22	4.5	0.067	6.0	LOS A	0.1	1.0	0.02	0.13	56.4
11	T1	1302	10.2	0.458	0.6	LOS A	1.5	11.3	0.04	0.04	59.4
Approach		1324	10.1	0.458	0.6	LOS A	1.5	11.3	0.04	0.04	59.3
All Vehicles		3510	6.0	0.639	6.6	LOS A	8.9	62.5	0.14	0.12	54.0

Level of Service (LOS) Method: Delay (RTA NSW).
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.

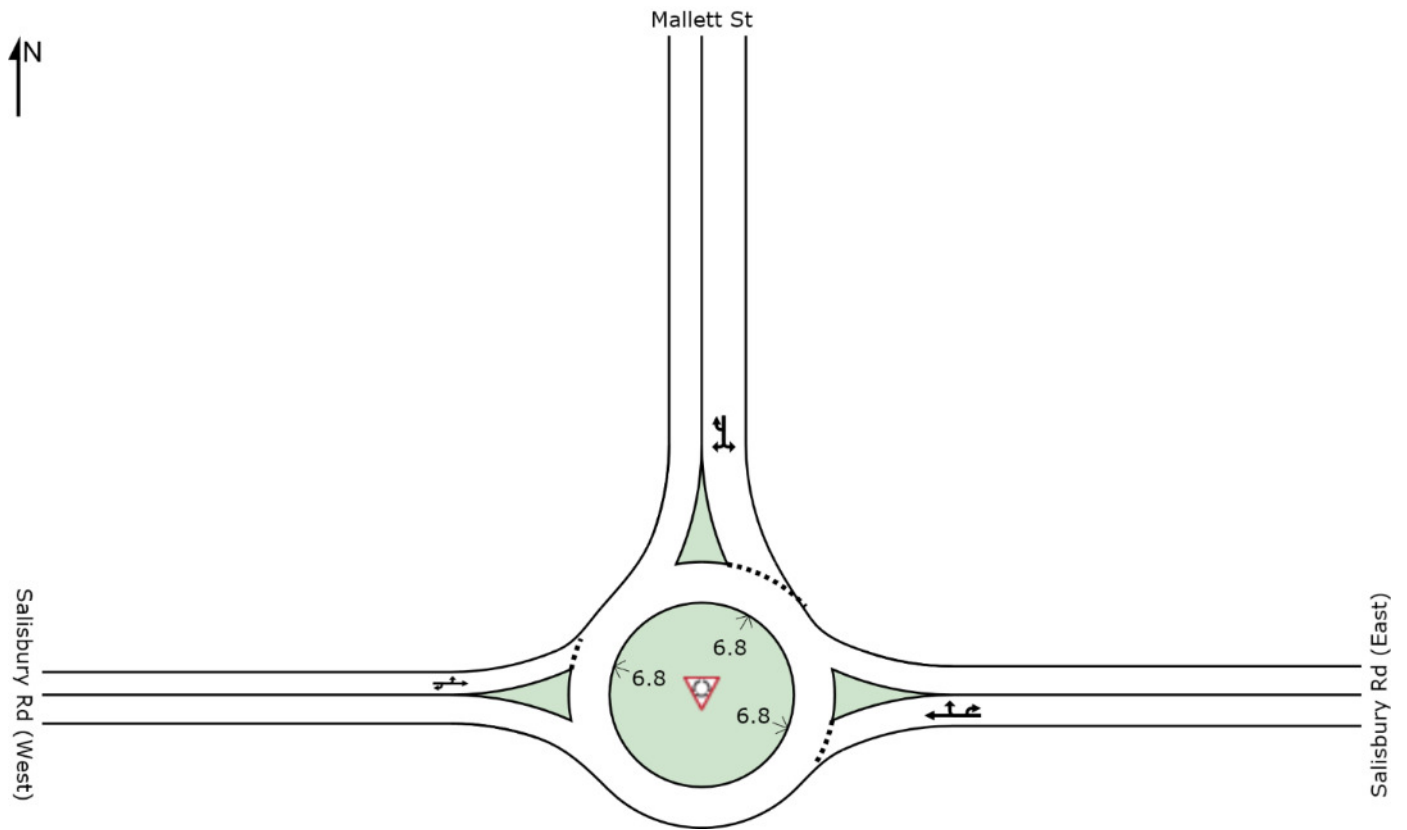
Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	26	7.6	LOS A	0.0	0.0	0.33	0.33
P2	East Full Crossing	16	62.3	LOS F	0.1	0.1	0.94	0.94
P3	North Full Crossing	51	7.2	LOS A	0.1	0.1	0.32	0.32
P4	West Full Crossing	55	62.4	LOS F	0.2	0.2	0.95	0.95
All Pedestrians		148	33.7	LOS D			0.62	0.62

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.

SITE LAYOUT

 Site: AM - POST - Salisbury Rd and Mallett St

New Site
Roundabout



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\160831sidra16S1251000_SITE 8_Salisbury Rd and Mallett St.sip6

MOVEMENT SUMMARY

 **Site: AM - POST - Salisbury Rd and Mallett St**

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows 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
East: Salisbury Rd (East)											
5	T1	213	2.5	0.322	6.3	LOS A	2.3	16.7	0.53	0.63	52.1
6	R2	92	3.4	0.322	9.0	LOS A	2.3	16.7	0.53	0.63	51.6
6u	U	23	0.0	0.322	10.3	LOS A	2.3	16.7	0.53	0.63	52.1
Approach		327	2.6	0.322	7.3	LOS A	2.3	16.7	0.53	0.63	52.0
North: Mallett St											
7	L2	193	2.2	0.839	29.8	LOS C	10.6	75.6	1.00	1.29	38.8
9	R2	180	1.2	0.839	31.8	LOS C	10.6	75.6	1.00	1.29	39.1
9u	U	1	0.0	0.839	33.2	LOS C	10.6	75.6	1.00	1.29	39.3
Approach		374	1.7	0.839	30.8	LOS C	10.6	75.6	1.00	1.29	38.9
West: Salisbury Rd (West)											
10	L2	255	2.1	0.952	13.5	LOS A	33.6	237.7	1.00	0.66	47.8
11	T1	920	0.9	0.952	13.3	LOS A	33.6	237.7	1.00	0.66	48.3
12u	U	4	0.0	0.952	17.4	LOS B	33.6	237.7	1.00	0.66	48.3
Approach		1179	1.2	0.952	13.4	LOS A	33.6	237.7	1.00	0.66	48.2
All Vehicles		1880	1.5	0.952	15.8	LOS B	33.6	237.7	0.92	0.78	46.6

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Roundabout Capacity Model: SIDRA Standard.

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.

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\160831sidra16S1251000_SITE 8_Salisbury Rd and Mallett St.sip6

MOVEMENT SUMMARY

 **Site: PM - POST - Salisbury Rd and Mallett St**

New Site
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
East: Salisbury Rd (East)											
5	T1	594	0.7	0.770	12.5	LOS A	11.3	79.8	0.96	1.01	49.8
6	R2	125	0.0	0.770	17.1	LOS B	11.3	79.8	0.96	1.01	49.8
6u	U	18	0.0	0.770	19.2	LOS B	11.3	79.8	0.96	1.01	50.7
Approach		737	0.6	0.770	13.5	LOS A	11.3	79.8	0.96	1.01	49.9
North: Mallett St											
7	L2	53	0.0	0.443	5.9	LOS A	2.7	18.9	0.61	0.77	50.6
9	R2	406	0.3	0.443	10.7	LOS A	2.7	18.9	0.61	0.77	51.7
9u	U	4	0.0	0.443	12.7	LOS A	2.7	18.9	0.61	0.77	52.6
Approach		463	0.2	0.443	10.1	LOS A	2.7	18.9	0.61	0.77	51.6
West: Salisbury Rd (West)											
10	L2	203	0.0	0.508	5.2	LOS A	5.4	38.1	0.62	0.54	52.9
11	T1	411	1.3	0.508	5.6	LOS A	5.4	38.1	0.62	0.54	54.2
12u	U	9	0.0	0.508	12.3	LOS A	5.4	38.1	0.62	0.54	55.1
Approach		623	0.8	0.508	5.6	LOS A	5.4	38.1	0.62	0.54	53.8
All Vehicles		1823	0.6	0.770	9.9	LOS A	11.3	79.8	0.75	0.79	51.6

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Roundabout Capacity Model: SIDRA Standard.

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.

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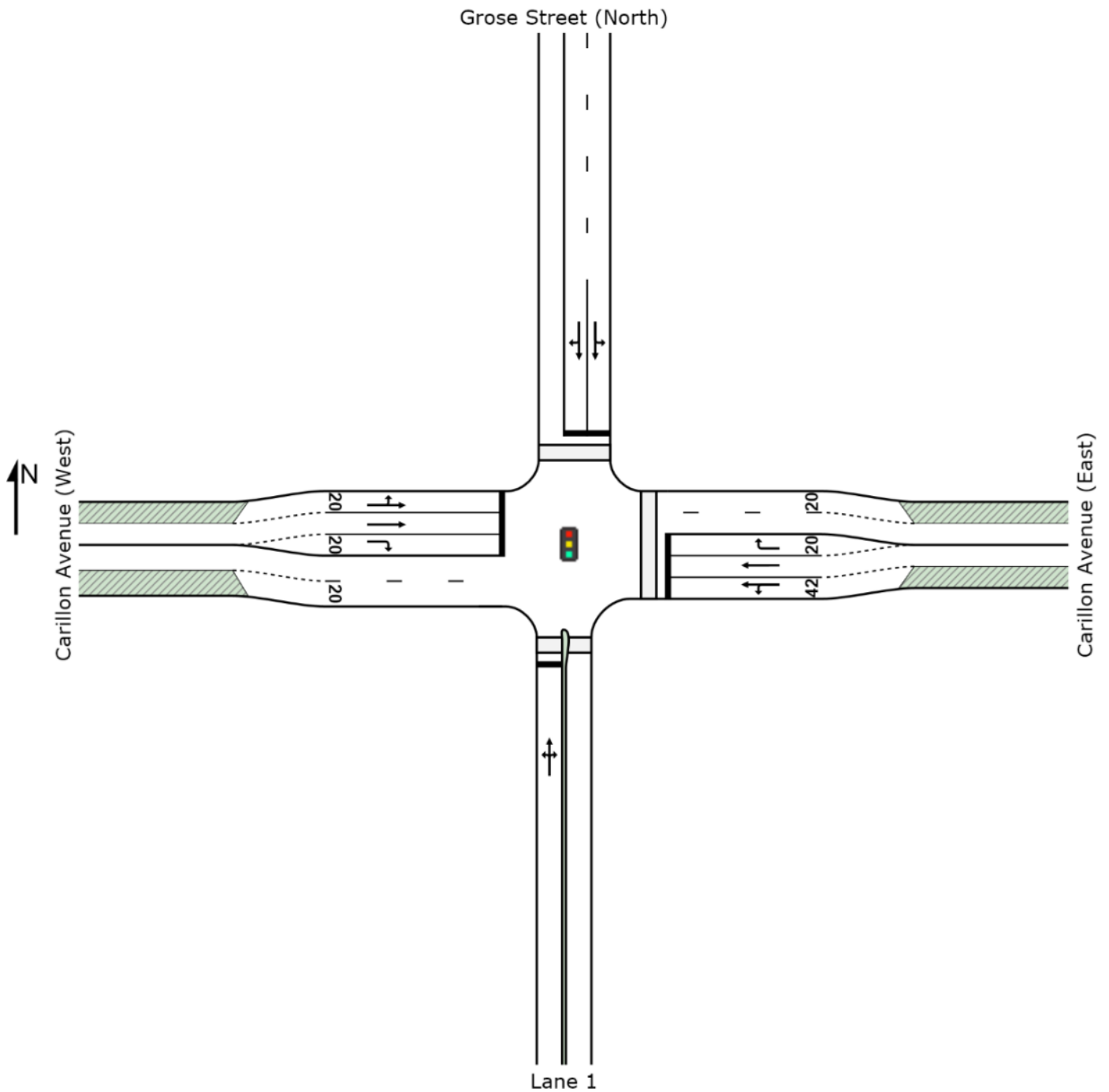
Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
\160831sidra16S1251000_SITE 8_Salisbury Rd and Mallett St.sip6

SITE LAYOUT

 **Site: AM - POST - Carillon St and Hospital Access**

New Site

Signals - Fixed Time Isolated



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\160901sidra16S1251000_SITE 9_Carillon Street and Hospital Access.sip6

MOVEMENT SUMMARY



Site: AM - POST - Carillon St and Hospital Access

New Site

Signals - Fixed Time Isolated Cycle Time = 120 seconds (Optimum Cycle Time - Minimum Delay)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue	Prop. Queued	Effective Stop Rate	Average Speed	
		Total veh/h	HV %	v/c	sec		Vehicles veh	Distance m	per veh	km/h	
South: Lane 1											
1	L2	8	0.0	0.133	67.8	LOS E	0.7	4.8	0.98	0.68	28.1
2	T1	1	0.0	0.133	62.3	LOS E	0.7	4.8	0.98	0.68	28.5
3	R2	2	0.0	0.133	67.8	LOS E	0.7	4.8	0.98	0.68	28.1
Approach		12	0.0	0.133	67.3	LOS E	0.7	4.8	0.98	0.68	28.2
East: Carillon Avenue (East)											
4	L2	1	0.0	0.032	7.0	LOS A	0.4	3.1	0.16	0.14	56.9
5	T1	297	1.8	0.155	1.6	LOS A	2.4	17.2	0.18	0.16	58.4
6	R2	272	0.0	0.814	31.3	LOS C	12.1	85.0	0.55	0.84	38.8
Approach		569	0.9	0.814	15.8	LOS B	12.1	85.0	0.36	0.48	47.1
North: Grose Street (North)											
7	L2	4	25.0	0.054	67.6	LOS E	0.2	2.1	0.98	0.64	27.8
8	T1	1	0.0	0.150	62.2	LOS E	0.8	5.7	0.99	0.68	28.5
9	R2	13	0.0	0.150	67.8	LOS E	0.8	5.7	0.99	0.68	28.1
Approach		18	5.9	0.150	67.4	LOS E	0.8	5.7	0.98	0.67	28.1
West: Carillon Avenue (West)											
10	L2	533	0.2	0.496	7.6	LOS A	6.5	45.4	0.23	0.65	52.1
11	T1	624	1.9	0.580	2.1	LOS A	8.0	56.9	0.24	0.22	58.0
12	R2	3	0.0	0.004	7.2	LOS A	0.0	0.2	0.17	0.60	52.1
Approach		1160	1.1	0.580	4.6	LOS A	8.0	56.9	0.24	0.42	55.1
All Vehicles		1759	1.1	0.814	9.3	LOS A	12.1	85.0	0.29	0.44	51.4

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P1	South Full Crossing	86	2.2	LOS A	0.1	0.1	0.19	0.19	
P2	East Full Crossing	14	54.2	LOS E	0.0	0.0	0.95	0.95	
P3	North Full Crossing	46	2.6	LOS A	0.0	0.0	0.21	0.21	
All Pedestrians		146	7.2	LOS A			0.27	0.27	

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.

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 \160901sidra16S1251000_SITE 9_Carillon Street and Hospital Access.sip6

MOVEMENT SUMMARY

 **Site: PM - POST - Carillon St and Hospital Access**

New Site

Signals - Fixed Time Isolated Cycle Time = 105 seconds (User-Given Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Lane 1											
1	L2	1	0.0	0.033	55.6	LOS D	0.2	1.4	0.95	0.63	31.3
2	T1	1	0.0	0.033	50.0	LOS D	0.2	1.4	0.95	0.63	31.8
3	R2	2	0.0	0.033	55.5	LOS D	0.2	1.4	0.95	0.63	31.3
Approach		4	0.0	0.033	54.2	LOS D	0.2	1.4	0.95	0.63	31.4
East: Carillon Avenue (East)											
4	L2	1	0.0	0.072	7.9	LOS A	1.1	8.0	0.22	0.19	56.2
5	T1	605	0.0	0.334	2.9	LOS A	6.8	47.3	0.28	0.25	57.3
6	R2	16	0.0	0.025	9.3	LOS A	0.2	1.5	0.27	0.63	50.7
Approach		622	0.0	0.334	3.0	LOS A	6.8	47.3	0.28	0.26	57.1
North: Hospital Access											
7	L2	48	0.0	0.309	56.5	LOS D	2.4	17.1	0.98	0.74	30.7
8	T1	1	0.0	0.339	51.2	LOS D	2.7	18.7	0.98	0.75	31.1
9	R2	52	0.0	0.339	56.7	LOS E	2.7	18.7	0.98	0.75	30.7
Approach		101	0.0	0.339	56.6	LOS E	2.7	18.7	0.98	0.74	30.7
West: Carillon Avenue (West)											
10	L2	23	0.0	0.065	7.9	LOS A	1.0	7.2	0.22	0.29	55.2
11	T1	521	0.0	0.305	2.8	LOS A	5.8	40.9	0.27	0.26	57.2
12	R2	1	0.0	0.002	9.4	LOS A	0.0	0.1	0.27	0.60	50.5
Approach		545	0.0	0.305	3.0	LOS A	5.8	40.9	0.27	0.26	57.1
All Vehicles		1273	0.0	0.339	7.5	LOS A	6.8	47.3	0.33	0.30	53.3

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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
P1	South Full Crossing	45	3.2	LOS A	0.0	0.0	0.25	0.25
P2	East Full Crossing	7	46.7	LOS E	0.0	0.0	0.94	0.94
P3	North Full Crossing	31	4.6	LOS A	0.0	0.0	0.30	0.30
All Pedestrians		83	7.6	LOS A			0.33	0.33

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.

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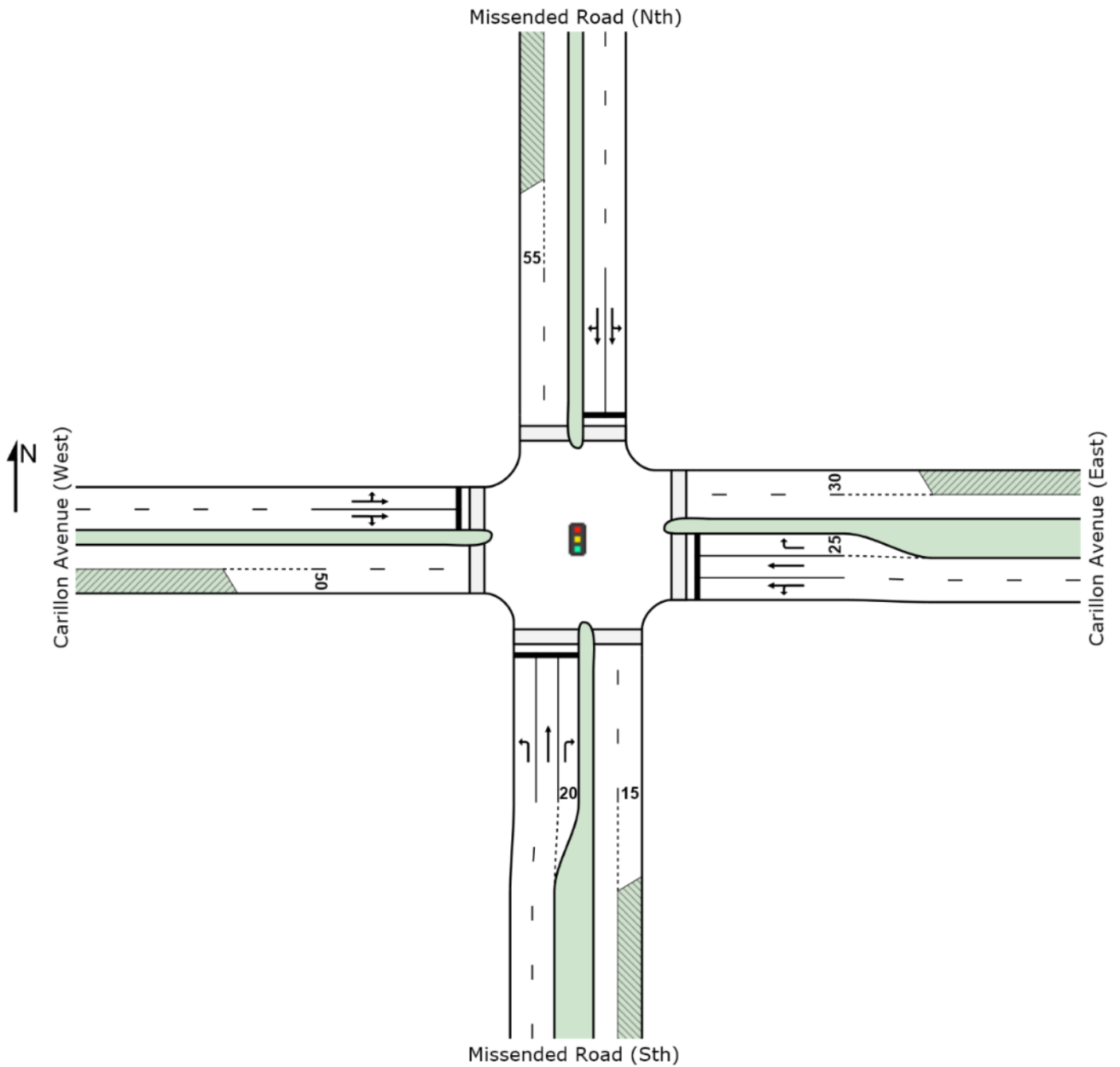
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SITE LAYOUT

 **Site: AM - POST - Carillon St and Missenden Rd**

New Site

Signals - Fixed Time Isolated



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\160901sidra16S1251000_SITE 10_Carillon Street and Missenden Road.sip6

MOVEMENT SUMMARY



Site: AM - POST - Carillon St and Missenden Rd

New Site

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Missended Road (Sth)											
1	L2	163	0.6	0.138	12.1	LOS A	3.1	22.1	0.41	0.68	48.9
2	T1	253	3.3	0.495	34.7	LOS C	11.6	83.9	0.84	0.71	38.3
3	R2	42	5.0	0.224	54.7	LOS D	2.2	16.3	0.91	0.75	31.2
Approach		458	2.5	0.495	28.5	LOS C	11.6	83.9	0.69	0.70	40.5
East: Carillon Avenue (East)											
4	L2	27	0.0	0.258	49.4	LOS D	4.8	34.0	0.89	0.72	33.9
5	T1	313	1.0	0.768	49.5	LOS D	13.8	97.7	0.95	0.84	33.1
6	R2	86	4.9	0.244	49.4	LOS D	4.3	31.3	0.88	0.76	32.5
Approach		426	1.7	0.768	49.5	LOS D	13.8	97.7	0.93	0.82	33.0
North: Missended Road (Nth)											
7	L2	152	3.5	0.166	19.2	LOS B	4.3	30.7	0.56	0.71	44.6
8	T1	195	3.8	0.796	50.9	LOS D	17.3	125.1	1.00	0.94	32.2
9	R2	95	4.4	0.796	56.5	LOS D	17.3	125.1	1.00	0.94	31.7
Approach		441	3.8	0.796	41.2	LOS C	17.3	125.1	0.85	0.86	35.4
West: Carillon Avenue (West)											
10	L2	94	7.9	0.201	36.2	LOS C	4.9	36.4	0.75	0.73	37.4
11	T1	441	1.0	0.785	40.3	LOS C	26.7	189.3	0.96	0.88	35.8
12	R2	72	5.9	0.785	46.5	LOS D	26.7	189.3	0.97	0.89	35.1
Approach		606	2.6	0.785	40.4	LOS C	26.7	189.3	0.93	0.86	36.0
All Vehicles		1932	2.7	0.796	39.7	LOS C	26.7	189.3	0.85	0.81	36.1

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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
P1	South Full Crossing	53	50.5	LOS E	0.2	0.2	0.92	0.92
P2	East Full Crossing	53	38.5	LOS D	0.1	0.1	0.80	0.80
P3	North Full Crossing	53	34.6	LOS D	0.1	0.1	0.76	0.76
P4	West Full Crossing	53	36.1	LOS D	0.1	0.1	0.78	0.78
All Pedestrians		211	39.9	LOS D			0.81	0.81

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: PM - POST - Carillon St and Missenden Rd

New Site

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Missended Road (Sth)											
1	L2	133	0.0	0.118	13.4	LOS A	2.8	19.3	0.44	0.68	48.1
2	T1	341	1.2	0.531	29.7	LOS C	14.9	105.3	0.80	0.69	40.4
3	R2	36	2.9	0.206	54.7	LOS D	1.9	13.6	0.91	0.74	31.2
Approach		509	1.0	0.531	27.2	LOS B	14.9	105.3	0.71	0.69	41.2
East: Carillon Avenue (East)											
4	L2	51	0.0	0.322	46.7	LOS D	6.9	48.3	0.87	0.74	34.6
5	T1	439	0.2	0.959	70.5	LOS E	25.9	181.7	0.97	1.09	27.8
6	R2	109	2.9	0.262	46.2	LOS D	5.3	37.7	0.86	0.77	33.6
Approach		599	0.7	0.959	64.0	LOS E	25.9	181.7	0.94	1.00	29.2
North: Missended Road (Nth)											
7	L2	214	0.5	0.193	13.9	LOS A	4.8	33.7	0.45	0.69	47.7
8	T1	265	3.2	0.925	67.7	LOS E	28.0	201.3	1.00	1.12	28.1
9	R2	120	2.6	0.925	73.4	LOS F	28.0	201.3	1.00	1.12	27.6
Approach		599	2.1	0.925	49.7	LOS D	28.0	201.3	0.80	0.97	32.8
West: Carillon Avenue (West)											
10	L2	61	8.6	0.245	46.0	LOS D	4.9	35.8	0.85	0.73	34.4
11	T1	396	0.0	0.954	72.4	LOS F	31.6	221.1	0.98	1.13	27.2
12	R2	65	0.0	0.954	81.7	LOS F	31.6	221.1	1.00	1.17	26.3
Approach		522	1.0	0.954	70.5	LOS E	31.6	221.1	0.97	1.09	27.8
All Vehicles		2229	1.2	0.959	53.3	LOS D	31.6	221.1	0.86	0.94	31.9

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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
P1	South Full Crossing	53	46.9	LOS E	0.2	0.2	0.89	0.89
P2	East Full Crossing	53	32.3	LOS D	0.1	0.1	0.73	0.73
P3	North Full Crossing	53	44.3	LOS E	0.2	0.2	0.86	0.86
P4	West Full Crossing	53	30.2	LOS D	0.1	0.1	0.71	0.71
All Pedestrians		211	38.4	LOS D			0.80	0.80

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.

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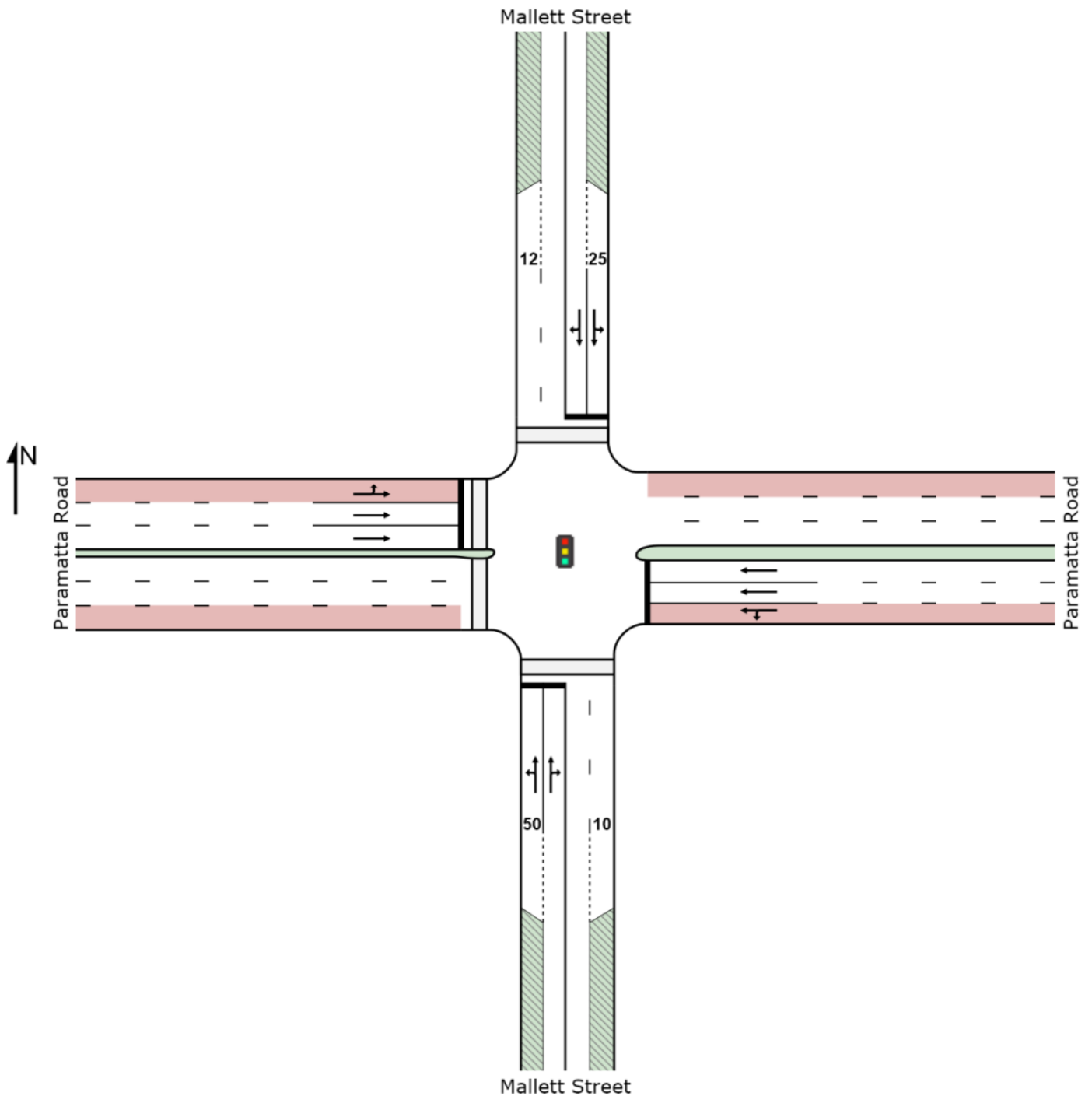
Project: P:\16S1200-1299\16S1251000 RPA Hospital - Lucas Street Car Park Planning\Modelling\160902 Revised Assessment
 \160901sidra16S1251000_SITE 10_Carillon Street and Missenden Road.sip6

SITE LAYOUT

 **Site: AM - POST - Paramatta Rd & Mallett St**

New Site

Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY



Site: AM - POST - Paramatta Rd & Mallett St

New Site

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Cycle Time)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Mallett Street											
1	L2	41	0.0	0.656	57.6	LOS E	13.3	94.0	0.96	0.81	31.7
2	T1	208	1.9	0.820	55.9	LOS D	13.3	94.0	0.96	0.82	31.0
3	R2	46	4.3	0.820	84.3	LOS F	5.7	40.9	1.00	0.92	25.3
Approach		295	2.0	0.820	60.5	LOS E	13.3	94.0	0.97	0.84	30.0
East: Paramatta Road											
4	L2	44	2.3	0.072	6.0	LOS A	0.1	1.0	0.02	0.26	55.1
5	T1	985	5.5	0.355	0.6	LOS A	1.0	7.0	0.03	0.04	59.4
Approach		1029	5.3	0.355	0.7	LOS A	1.0	7.0	0.03	0.05	59.2
North: Mallett Street											
7	L2	70	7.1	0.888	83.1	LOS F	20.8	148.9	0.99	1.07	25.8
8	T1	262	0.8	0.987	88.4	LOS F	20.8	148.9	0.99	1.11	24.3
9	R2	27	0.0	0.987	126.5	LOS F	8.9	62.2	1.00	1.20	19.8
Approach		359	1.9	0.987	90.2	LOS F	20.8	148.9	0.99	1.11	24.2
West: Paramatta Road											
10	L2	22	9.1	0.069	6.1	LOS A	0.1	1.0	0.02	0.14	56.3
11	T1	1946	6.8	0.709	0.8	LOS A	4.2	30.4	0.07	0.07	59.1
Approach		1968	6.8	0.709	0.9	LOS A	4.2	30.4	0.07	0.07	59.1
All Vehicles		3651	5.5	0.987	14.5	LOS A	20.8	148.9	0.22	0.23	48.4

Level of Service (LOS) Method: Delay (RTA NSW).

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.

The results of iterative calculations indicate a somewhat unstable solution. See the Diagnostics section in the Detailed Output report.

Movement Performance - Pedestrians								
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped
P1	South Full Crossing	26	8.9	LOS A	0.0	0.0	0.36	0.36
P3	North Full Crossing	51	8.6	LOS A	0.1	0.1	0.35	0.35
P4	West Full Crossing	55	58.6	LOS E	0.2	0.2	0.92	0.92
All Pedestrians		132	29.5	LOS C			0.59	0.59

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.

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MOVEMENT SUMMARY



Site: PM - POST - Paramatta Rd & Mallett St

New Site

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Variable Sequence Analysis applied. The results are given for the selected output sequence.

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Mallett Street											
1	L2	61	1.6	0.819	71.2	LOS F	16.1	114.0	1.00	0.97	28.2
2	T1	261	1.5	0.819	68.5	LOS E	16.1	114.0	1.00	0.96	28.0
3	R2	38	0.0	0.819	79.4	LOS F	9.5	67.1	1.00	0.94	26.6
Approach		360	1.4	0.819	70.1	LOS E	16.1	114.0	1.00	0.96	27.9
East: Paramatta Road											
4	L2	96	1.0	0.128	6.0	LOS A	0.2	2.0	0.02	0.31	54.8
5	T1	1836	4.8	0.640	0.7	LOS A	3.2	22.9	0.06	0.06	59.2
Approach		1932	4.7	0.640	0.9	LOS A	3.2	22.9	0.06	0.07	59.0
North: Mallett Street											
7	L2	54	0.0	0.849	70.9	LOS F	15.1	106.3	0.99	0.98	28.3
8	T1	230	0.4	0.943	74.4	LOS F	15.1	106.3	0.99	1.02	26.8
9	R2	22	4.5	0.943	101.8	LOS F	7.5	53.1	1.00	1.11	22.9
Approach		306	0.7	0.943	75.7	LOS F	15.1	106.3	0.99	1.02	26.8
West: Paramatta Road											
10	L2	32	3.1	0.065	6.0	LOS A	0.1	1.0	0.02	0.20	55.7
11	T1	1223	4.1	0.416	0.5	LOS A	1.3	9.4	0.04	0.04	59.4
Approach		1255	4.1	0.416	0.6	LOS A	1.3	9.4	0.04	0.04	59.3
All Vehicles		3853	3.8	0.943	13.3	LOS A	16.1	114.0	0.21	0.22	49.2

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P1	South Full Crossing	26	7.6	LOS A	0.0	0.0	0.33	0.33	
P3	North Full Crossing	51	7.2	LOS A	0.1	0.1	0.32	0.32	
P4	West Full Crossing	55	62.4	LOS F	0.2	0.2	0.95	0.95	
All Pedestrians		132	30.3	LOS D			0.58	0.58	

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.

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SITE LAYOUT



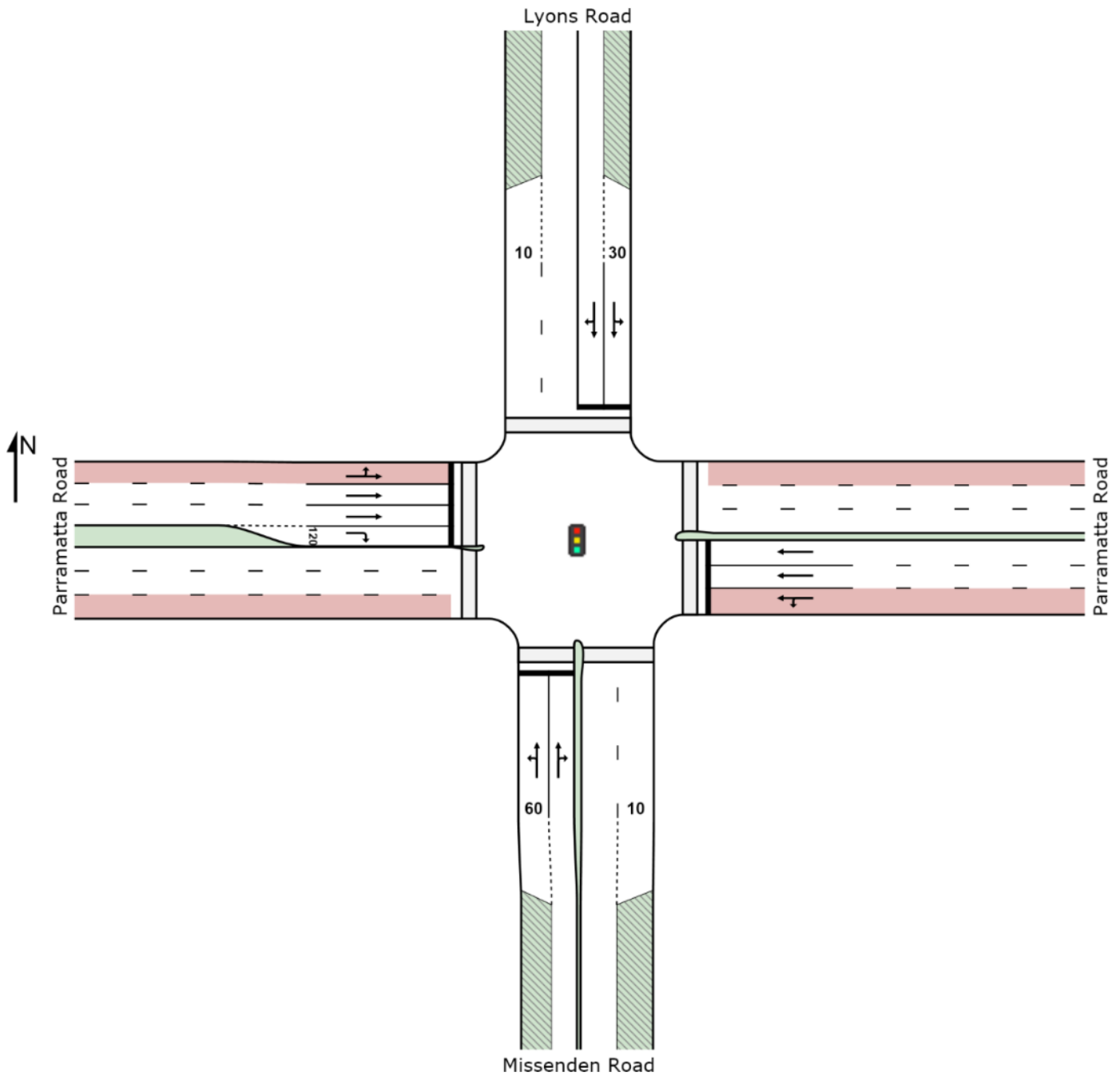
Site: AM - POST - Parramatta Road and Missenden Road and Lyons Road

N105960

Lucas Street Car Park, Camperdown

Post-Development AM Peak

Signals - Fixed Time Isolated



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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160906sid-N106360 Additional Intersections - Post.sip6

MOVEMENT SUMMARY



Site: AM - POST - Parramatta Road and Missenden Road and Lyons Road

N105960

Lucas Street Car Park, Camperdown

Post-Development AM Peak

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Missenden Road											
1	L2	100	1.1	0.300	48.8	LOS D	8.4	59.4	0.84	0.75	33.5
2	T1	145	3.6	0.600	50.5	LOS D	10.9	81.8	0.91	0.79	26.4
3	R2	85	9.9	0.600	60.8	LOS E	10.9	81.8	0.96	0.81	30.6
Approach		331	4.5	0.600	52.6	LOS D	10.9	81.8	0.90	0.78	29.8
East: Parramatta Road											
4	L2	156	5.4	0.216	26.9	LOS B	6.9	55.9	0.60	0.68	41.2
5	T1	935	7.4	0.488	25.0	LOS B	20.6	150.1	0.72	0.64	42.6
Approach		1091	7.1	0.488	25.1	LOS B	20.6	150.1	0.70	0.65	42.4
North: Lyons Road											
7	L2	62	3.4	0.287	51.8	LOS D	7.4	52.7	0.86	0.74	27.2
8	T1	204	1.5	0.287	46.2	LOS D	7.4	52.7	0.86	0.71	28.3
9	R2	1	0.0	0.287	51.8	LOS D	7.4	52.6	0.86	0.70	28.4
Approach		267	2.0	0.287	47.5	LOS D	7.4	52.7	0.86	0.72	28.1
West: Parramatta Road											
10	L2	16	13.3	0.072	6.2	LOS A	0.1	1.0	0.02	0.10	55.2
11	T1	2023	6.8	0.795	1.0	LOS A	6.0	43.6	0.10	0.09	59.0
12	R2	178	5.9	0.755	64.5	LOS E	11.8	87.0	0.98	0.84	28.9
Approach		2217	6.8	0.795	6.1	LOS A	11.8	87.0	0.17	0.15	54.4
All Vehicles		3905	6.4	0.795	18.3	LOS B	20.6	150.1	0.43	0.38	45.7

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P1	South Full Crossing	23	26.4	LOS C	0.1	0.1	0.61	0.61	
P2	East Full Crossing	103	54.3	LOS E	0.4	0.4	0.88	0.88	
P3	North Full Crossing	52	12.9	LOS B	0.1	0.1	0.43	0.43	
P4	West Full Crossing	161	54.4	LOS E	0.6	0.6	0.88	0.88	
All Pedestrians		339	46.1	LOS E			0.80	0.80	

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: PM - POST - Parramatta Road and Missenden Road and Lyons Road

N105960

Lucas Street Car Park, Camperdown

Post-Development PM Peak

Signals - Fixed Time Coordinated Cycle Time = 140 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Missenden Road											
1	L2	180	2.3	0.460	50.3	LOS D	14.0	99.2	0.88	0.79	32.8
2	T1	243	1.3	0.920	69.6	LOS E	20.6	148.7	0.97	1.00	22.2
3	R2	83	7.6	0.920	84.9	LOS F	20.6	148.7	1.00	1.08	25.7
Approach		506	2.7	0.920	65.3	LOS E	20.6	148.7	0.94	0.94	26.5
East: Parramatta Road											
4	L2	206	2.0	0.305	28.0	LOS B	10.2	84.2	0.64	0.69	40.8
5	T1	1720	4.8	0.881	39.5	LOS C	55.3	393.8	0.96	0.94	36.5
Approach		1926	4.5	0.881	38.2	LOS C	55.3	393.8	0.93	0.91	36.9
North: Lyons Road											
7	L2	37	0.0	0.213	50.8	LOS D	5.5	38.4	0.84	0.71	27.7
8	T1	127	1.7	0.213	48.3	LOS D	5.5	38.4	0.86	0.70	27.6
9	R2	8	25.0	0.213	57.3	LOS E	4.1	30.3	0.88	0.70	26.3
Approach		173	2.4	0.213	49.3	LOS D	5.5	38.4	0.86	0.70	27.6
West: Parramatta Road											
10	L2	35	0.0	0.077	6.1	LOS A	0.1	1.1	0.02	0.20	53.8
11	T1	1222	4.0	0.465	0.7	LOS A	1.5	10.2	0.04	0.04	59.2
12	R2	225	1.4	0.927	74.7	LOS F	16.9	119.9	1.00	0.94	26.8
Approach		1482	3.6	0.927	12.0	LOS A	16.9	119.9	0.18	0.18	49.9
All Vehicles		4087	3.8	0.927	32.6	LOS C	55.3	393.8	0.66	0.64	38.6

Level of Service (LOS) Method: Delay (RTA NSW).

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.

Movement Performance - Pedestrians									
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Queue Distance m	Prop. Queued	Effective Stop Rate per ped	
P1	South Full Crossing	57	26.5	LOS C	0.1	0.1	0.62	0.62	
P2	East Full Crossing	124	54.3	LOS E	0.4	0.4	0.88	0.88	
P3	North Full Crossing	68	12.9	LOS B	0.1	0.1	0.43	0.43	
P4	West Full Crossing	138	54.3	LOS E	0.5	0.5	0.88	0.88	
All Pedestrians		387	42.9	LOS E			0.76	0.76	

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.

SITE LAYOUT

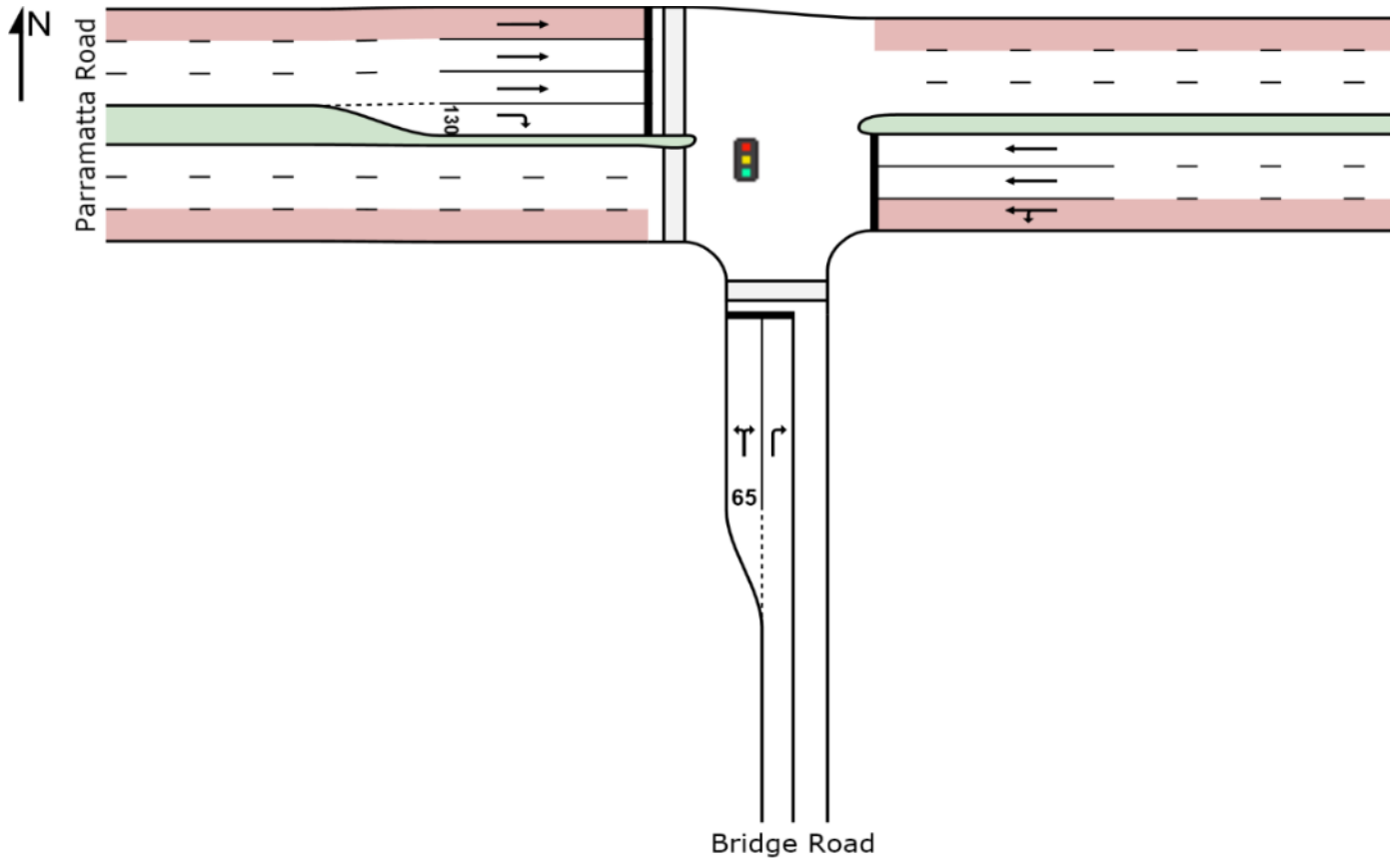
 **Site: AM - POST - Parramatta Road and Bridge Road**

N105960

Lucas Street Car Park, Camperdown

Post-Development AM Peak

Signals - Fixed Time Coordinated



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MOVEMENT SUMMARY



Site: AM - POST - Parramatta Road and Bridge Road

N105960

Lucas Street Car Park, Camperdown

Post-Development AM Peak

Signals - Fixed Time Coordinated Cycle Time = 130 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Bridge Road											
1	L2	66	6.3	0.994	108.3	LOS F	23.8	170.7	1.00	1.10	21.4
3	R2	468	1.8	0.994	108.4	LOS F	23.8	170.7	1.00	1.10	21.4
Approach		535	2.4	0.994	108.4	LOS F	23.8	170.7	1.00	1.10	21.4
East: Parramatta Road											
4	L2	157	4.0	0.382	6.2	LOS A	0.9	6.3	0.03	0.23	55.8
5	T1	1199	5.2	0.382	0.7	LOS A	0.9	6.6	0.03	0.08	58.9
Approach		1356	5.0	0.382	1.3	LOS A	0.9	6.6	0.03	0.10	58.5
West: Parramatta Road											
11	T1	2161	7.6	0.771	0.9	LOS A	5.5	40.9	0.09	0.08	59.1
12	R2	219	7.2	0.628	19.1	LOS B	10.4	77.2	0.82	0.84	44.7
Approach		2380	7.6	0.771	2.6	LOS A	10.4	77.2	0.16	0.15	57.4
All Vehicles		4271	6.1	0.994	15.4	LOS B	23.8	170.7	0.22	0.25	47.6

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P1	South Full Crossing	38	11.7	LOS B	0.1	0.1	0.42	0.42	
P4	West Full Crossing	108	59.4	LOS E	0.4	0.4	0.96	0.96	
All Pedestrians		146	47.0	LOS E			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.

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MOVEMENT SUMMARY

 **Site: PM - POST - Parramatta Road and Bridge Road**

N105960

Lucas Street Car Park, Camperdown

Post Development PM Peak

Signals - Fixed Time Coordinated Cycle Time = 130 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Bridge Road											
1	L2	105	3.0	0.575	59.2	LOS E	10.9	77.3	0.97	0.82	30.0
3	R2	240	0.4	0.575	60.8	LOS E	10.9	77.3	0.98	0.81	29.6
Approach		345	1.2	0.575	60.3	LOS E	10.9	77.3	0.97	0.81	29.7
East: Parramatta Road											
4	L2	560	0.2	0.670	6.4	LOS A	2.4	17.8	0.05	0.46	53.8
5	T1	1815	5.9	0.670	0.9	LOS A	2.9	21.1	0.06	0.10	58.7
Approach		2375	4.6	0.670	2.2	LOS A	2.9	21.1	0.06	0.19	57.5
West: Parramatta Road											
11	T1	1440	4.3	0.479	0.6	LOS A	1.6	11.5	0.04	0.04	59.4
12	R2	172	1.8	0.756	59.1	LOS E	12.6	89.5	1.00	1.08	30.1
Approach		1612	4.0	0.756	6.8	LOS A	12.6	89.5	0.14	0.15	53.8
All Vehicles		4332	4.1	0.756	8.5	LOS A	12.6	89.5	0.16	0.22	52.3

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P1	South Full Crossing	69	11.7	LOS B	0.1	0.1	0.42	0.42	
P4	West Full Crossing	91	59.4	LOS E	0.3	0.3	0.96	0.96	
All Pedestrians		160	38.7	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.

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SITE LAYOUT

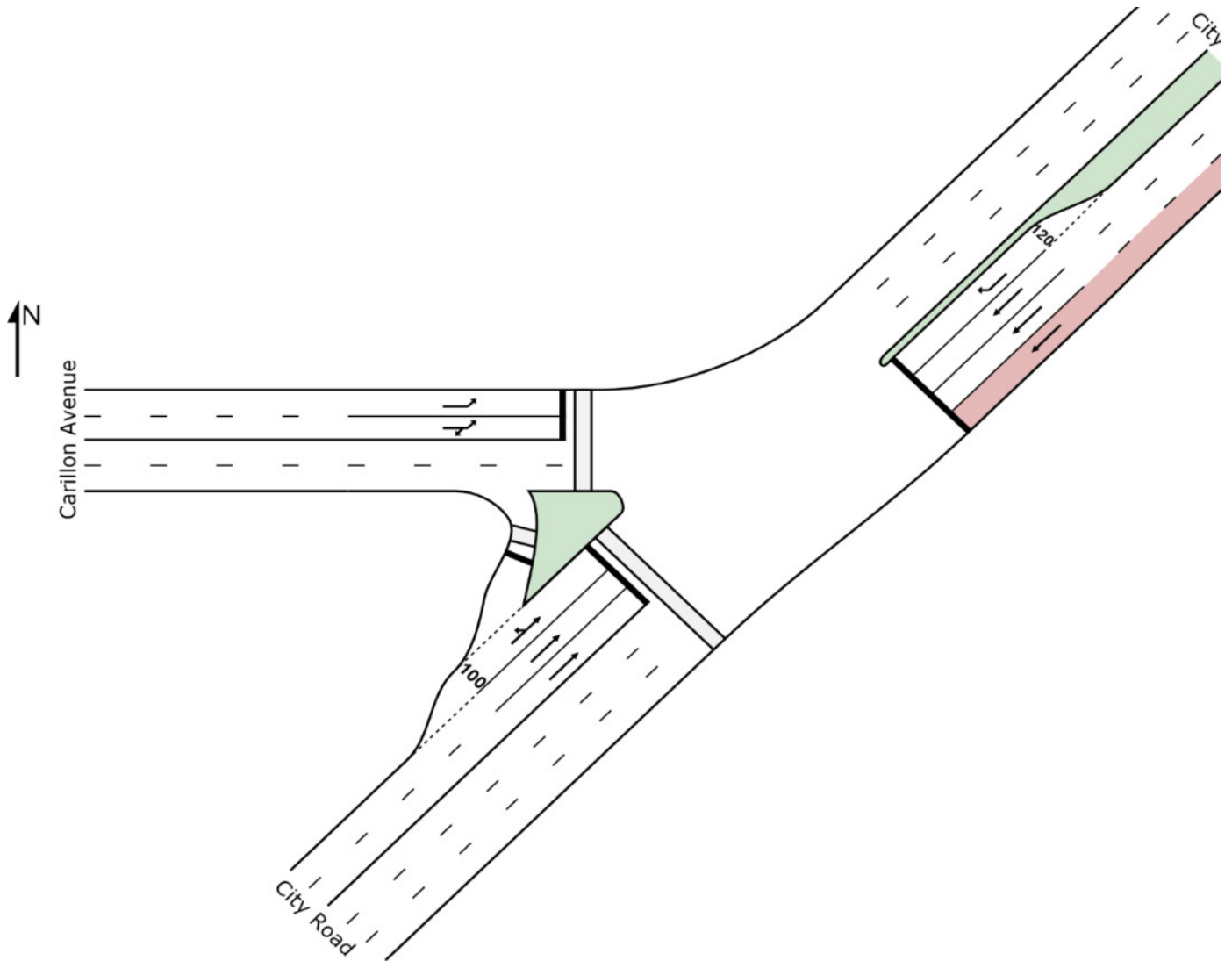
 **Site: AM - POST - Carrillon Avenue and City Road**

N105960

Lucas Street Car Park, Camperdown

Post-Development AM Peak

Signals - Fixed Time Isolated



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MOVEMENT SUMMARY



Site: AM - POST - Carrillon Avenue and City Road

N105960

Lucas Street Car Park, Camperdown

Post-Development AM Peak

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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
NorthEast: City Road											
25	T1	476	11.5	0.164	5.1	LOS A	3.9	28.8	0.32	0.27	49.5
26a	R1	313	2.0	0.642	47.1	LOS D	16.4	116.6	0.95	0.83	29.0
Approach		788	7.7	0.642	21.7	LOS B	16.4	116.6	0.57	0.50	35.6
West: Carillon Avenue											
10a	L1	458	3.0	0.404	31.0	LOS C	13.6	97.4	0.74	0.76	34.7
12b	R3	46	2.3	0.404	51.2	LOS D	7.3	52.5	0.91	0.79	26.5
Approach		504	2.9	0.404	32.9	LOS C	13.6	97.4	0.76	0.77	33.8
SouthWest: City Road											
30b	L3	64	1.6	0.151	19.2	LOS B	2.6	24.5	0.61	0.59	42.6
31	T1	1435	7.1	0.901	46.0	LOS D	46.2	335.9	0.97	1.01	20.6
Approach		1499	6.9	0.901	44.8	LOS D	46.2	335.9	0.96	0.99	21.2
All Vehicles		2792	6.4	0.901	36.2	LOS C	46.2	335.9	0.81	0.81	27.2

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P4	West Full Crossing	37	26.0	LOS C	0.1	0.1	0.66	0.66	
P8	SouthWest Full Crossing	62	54.3	LOS E	0.2	0.2	0.95	0.95	
P8S	SouthWest Slip/Bypass Lane Crossing	37	0.5	LOS A	0.0	0.0	0.13	0.13	
All Pedestrians		136	32.0	LOS D			0.65	0.65	

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.

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MOVEMENT SUMMARY



Site: PM - POST - Carrillon Avenue and City Road

N105960

Lucas Street Car Park, Camperdown

Post-Development PM Peak

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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
NorthEast: City Road											
25	T1	1038	6.0	0.348	5.6	LOS A	9.9	70.4	0.37	0.33	48.5
26a	R1	506	1.0	0.681	36.7	LOS C	24.5	172.7	0.89	0.84	32.7
Approach		1544	4.4	0.681	15.8	LOS B	24.5	172.7	0.54	0.50	39.4
West: Carillon Avenue											
10a	L1	543	1.9	0.466	19.3	LOS B	16.9	120.4	0.61	0.74	41.2
12b	R3	108	0.0	0.466	56.3	LOS D	6.6	46.3	0.95	0.80	24.9
Approach		652	1.6	0.466	25.5	LOS B	16.9	120.4	0.66	0.75	37.4
SouthWest: City Road											
30b	L3	81	2.6	0.262	31.6	LOS C	4.5	42.3	0.77	0.72	35.1
31	T1	822	6.5	0.669	38.8	LOS C	19.9	140.2	0.93	0.81	22.8
Approach		903	6.2	0.669	38.0	LOS C	19.9	140.2	0.91	0.80	24.0
All Vehicles		3099	4.3	0.681	24.4	LOS B	24.5	172.7	0.68	0.64	33.8

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	
P4	West Full Crossing	171	37.1	LOS D	0.5	0.5	0.79	0.79	
P8	SouthWest Full Crossing	68	54.3	LOS E	0.2	0.2	0.95	0.95	
P8S	SouthWest Slip/Bypass Lane Crossing	171	0.5	LOS A	0.0	0.0	0.13	0.13	
All Pedestrians		409	24.7	LOS C			0.54	0.54	

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.

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SITE LAYOUT

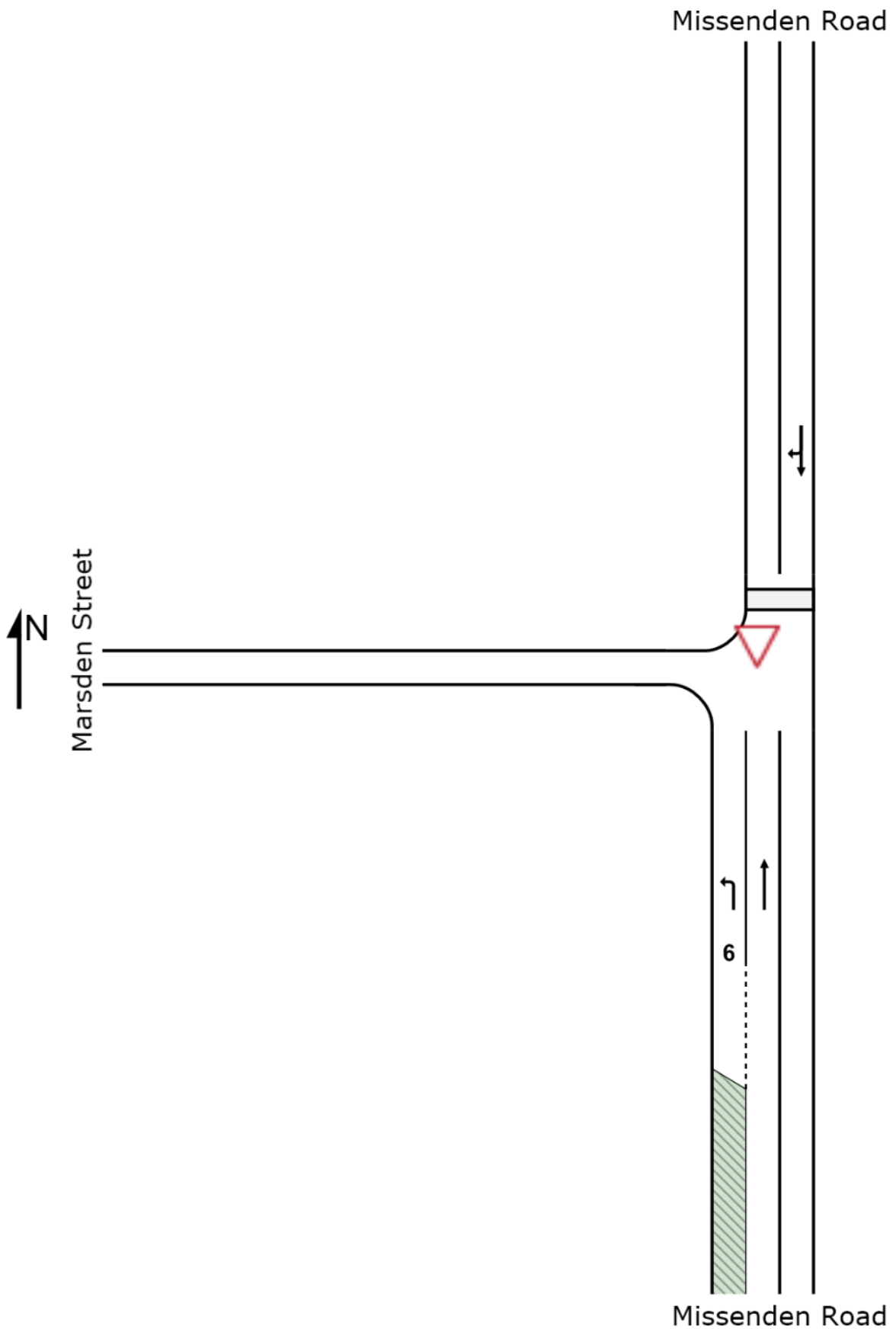
▽ Site: AM - POST - Missenden Road and Marsden Street

N105960

Lucas Street Car Park, Campderdown

Post-Development AM Peak

Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

▽ Site: AM - POST - Missenden Road and Marsden Street

N105960

Lucas Street Car Park, Campderdown

Post-Development AM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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: Missenden Road											
1	L2	27	7.7	0.016	5.6	LOS A	0.0	0.0	0.00	0.57	50.6
2	T1	353	6.6	0.189	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		380	6.6	0.189	0.4	NA	0.0	0.0	0.00	0.04	59.0
North: Missenden Road											
8	T1	498	4.7	0.289	0.2	LOS A	0.3	2.1	0.06	0.03	59.0
9	R2	24	0.0	0.289	8.2	LOS A	0.3	2.1	0.06	0.03	51.1
Approach		522	4.4	0.289	0.6	NA	0.3	2.1	0.06	0.03	58.8
All Vehicles		902	5.4	0.289	0.5	NA	0.3	2.1	0.03	0.04	58.9

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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MOVEMENT SUMMARY

▽ Site: PM - POST - Missenden Road and Marsden Street

N105960

Lucas Street Car Park, Camperdown

Post-Development PM Peak

Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Missenden Road											
1	L2	29	0.0	0.016	5.5	LOS A	0.0	0.0	0.00	0.58	51.3
2	T1	464	2.0	0.241	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		494	1.9	0.241	0.4	NA	0.0	0.0	0.00	0.03	59.3
North: Missenden Road											
8	T1	483	2.4	0.320	0.8	LOS A	0.9	6.2	0.17	0.08	57.3
9	R2	57	0.0	0.320	9.4	LOS A	0.9	6.2	0.17	0.08	48.6
Approach		540	2.1	0.320	1.7	NA	0.9	6.2	0.17	0.08	56.8
All Vehicles		1034	2.0	0.320	1.0	NA	0.9	6.2	0.09	0.06	58.0

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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Project: P:\N10600-10699\N106360 Lucas Street, Camperdown - Consultation\Modelling\160906sid-N106360 Additional Intersections - Post.sip6

SITE LAYOUT

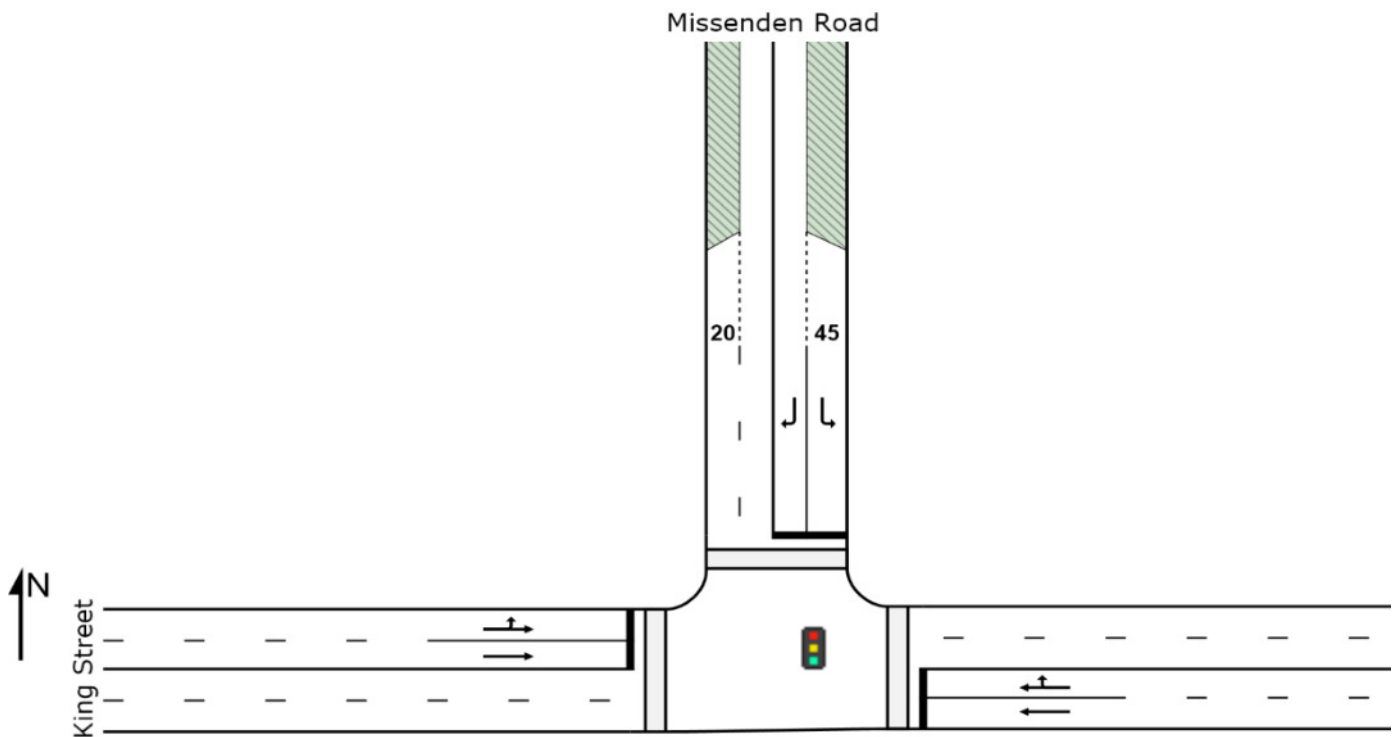
 **Site: AM - POST - Missenden Road and King Street**

N105960

Lucas Street Car Park, Campderdown

Post-Development AM Peak

Signals - Fixed Time Isolated



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MOVEMENT SUMMARY



Site: AM - POST - Missenden Road and King Street

N105960

Lucas Street Car Park, Campderdown

Post-Development AM Peak

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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
East: King Street											
5	T1	475	13.7	0.383	8.2	LOS A	11.4	89.4	0.45	0.40	52.9
6	R2	72	2.9	0.390	48.1	LOS D	4.0	28.5	0.95	0.81	33.0
Approach		546	12.3	0.390	13.4	LOS A	11.4	89.4	0.52	0.46	49.0
North: Missenden Road											
7	L2	43	2.4	0.072	36.0	LOS C	1.7	12.5	0.73	0.71	37.0
9	R2	208	5.6	0.562	52.1	LOS D	11.1	81.3	0.95	0.82	31.8
Approach		252	5.0	0.562	49.3	LOS D	11.1	81.3	0.91	0.80	32.6
West: King Street											
10	L2	393	19.3	0.826	26.5	LOS B	36.7	284.7	0.80	0.80	42.3
11	T1	1373	2.7	0.826	21.2	LOS B	42.9	302.3	0.85	0.81	44.1
Approach		1765	6.4	0.826	22.4	LOS B	42.9	302.3	0.84	0.81	43.7
All Vehicles		2563	7.5	0.826	23.1	LOS B	42.9	302.3	0.78	0.73	43.2

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	131	46.2	LOS E	0.4	0.4	0.88	0.88	
P3	North Full Crossing	52	15.5	LOS B	0.1	0.1	0.51	0.51	
P4	West Full Crossing	116	46.2	LOS E	0.3	0.3	0.88	0.88	
All Pedestrians		298	40.9	LOS E			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.

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MOVEMENT SUMMARY



Site: PM - POST - Missenden Road and King Street

N105960

Lucas Street Car Park, Campderdown

Post-Development PM Peak

Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Phase Times)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand 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
East: King Street											
5	T1	968	1.5	0.689	12.3	LOS A	31.2	221.0	0.66	0.61	49.8
6	R2	175	23.5	0.689	33.3	LOS C	11.6	94.4	0.93	0.88	38.7
Approach		1143	4.9	0.689	15.5	LOS B	31.2	221.0	0.70	0.65	47.7
North: Missenden Road											
7	L2	49	0.0	0.081	36.1	LOS C	2.0	14.0	0.73	0.72	37.0
9	R2	289	3.6	0.808	59.1	LOS E	17.3	124.9	1.00	0.90	30.0
Approach		339	3.1	0.808	55.8	LOS D	17.3	124.9	0.96	0.88	30.8
West: King Street											
10	L2	246	1.7	0.476	20.3	LOS B	15.7	121.2	0.60	0.65	45.4
11	T1	772	8.2	0.476	15.1	LOS B	17.5	124.3	0.61	0.59	47.5
Approach		1018	6.6	0.476	16.3	LOS B	17.5	124.3	0.61	0.60	47.0
All Vehicles		2500	5.3	0.808	21.3	LOS B	31.2	221.0	0.70	0.66	44.2

Level of Service (LOS) Method: Delay (RTA NSW).

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.

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	254	46.4	LOS E	0.8	0.8	0.88	0.88
P3	North Full Crossing	271	15.7	LOS B	0.5	0.5	0.51	0.51
P4	West Full Crossing	284	46.5	LOS E	0.9	0.9	0.89	0.89
All Pedestrians		808	36.2	LOS D			0.76	0.76

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.

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Appendix C

Compliance Review and Swept Path Assessment

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