300 Manchester Road Auburn

PAYCE

Traffic and Transport Impact Assessment

| Rev 8

29 August 2018

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300 Manchester Road Auburn

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1. Introduction

Jacobs has been commissioned by M Projects on behalf of PAYCE to prepare a traffic and transport impact assessment for the proposed rezoning of industrial land within 300 Manchester Road Auburn. This report assesses the existing traffic and transport conditions, description of the proposed development and assessment of the impact of the development on the transport network.

1.1 Background

PAYCE is seeking to rezone an industrial land within the Auburn LGA. The subject site is zoned for industrial land uses. The site covers 14.2 hectares of land owned by PAYCE. It is currently used for industrial purposes with a brown field, warehouse operated by BlueScope Steel.

The proposed land rezoning is to comprise a mix of the following proposed land uses:

- Retail – 1,000sqm GFA; small shops only
- Community Centre – 1,000sqm GFA
- Commercial Office – 7,500sqm GFA
- Industrial business park – 75,000sqm GFA
- 1,150 dwellings (all units)

A planning proposal was issued to Cumberland Council (Council) in December 2017. Subsequently, Jacobs and M Projects met with Council twice, on 11 July 2018 and 24 July 2018 to discuss the traffic and transport meetings. In response to Council's comments we have make the following that:

- A network model for the South Parade / Rawson Street should be included.
- The physical layout of the proposed intersections should be provided to allow for vehicle turn paths.
- The Mona Street / Chisholm Road intersection model should be validated.

These issues have been addressed in this latest report.

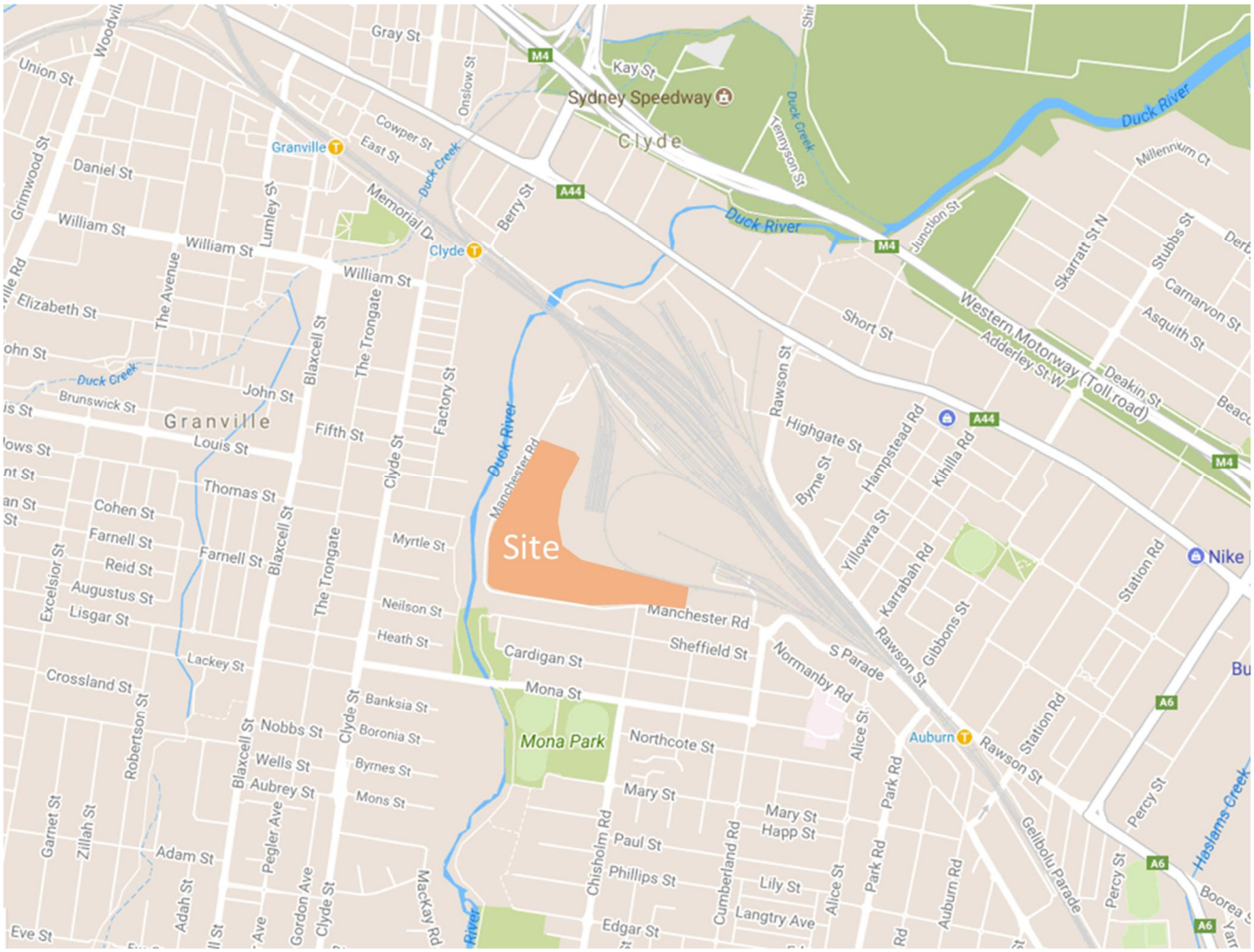
1.2 Location

The subject site is located in Auburn near the western rail line. It is located some 3.5 km from Parramatta and 18km from the Sydney CBD. The site context is shown in Figure 1.1

Figure 1.1: Site context

The site is located at 300 Manchester Road Auburn, near the intersection of Chisholm Road and Manchester Road. The site's frontage is Manchester Road to the south and the end of Manchester road with Duck River (560m) to the west.

Figure 1.2 : Site location



1.3 Report structure

This report has the following structure:

- Section 2 Existing Conditions – Summarises the existing transport context of the site.
- Section 3 Proposal – Provides a description of the projects.
- Section 4 Traffic Impacts – Analysis of the impacts the development will have on the transport network.
- Section 5 Conclusion – Summarises the findings of the study.

2. Existing conditions

2.1 Overview

The following section outlines the existing traffic and transport conditions surrounding the site for traffic, public transport, pedestrians and cyclists.

2.2 Existing developments

The site covers 14.2 hectares of land owned by PAYCE. It is currently used for industrial purposes with a brown field, warehouse operated by BlueScope Steel.

2.3 Road network

The site is accessed from Manchester Road. The site's road connections are constrained by the railway to the north and the Duck River to the west of the site. The nearest arterial roads to the site are Parramatta Road to the north, the route A6 St Hilliers Road / Olympic Drive over 2km to the east of the site and Woodville Road to the west.

Figure 2.1: Regional road network context

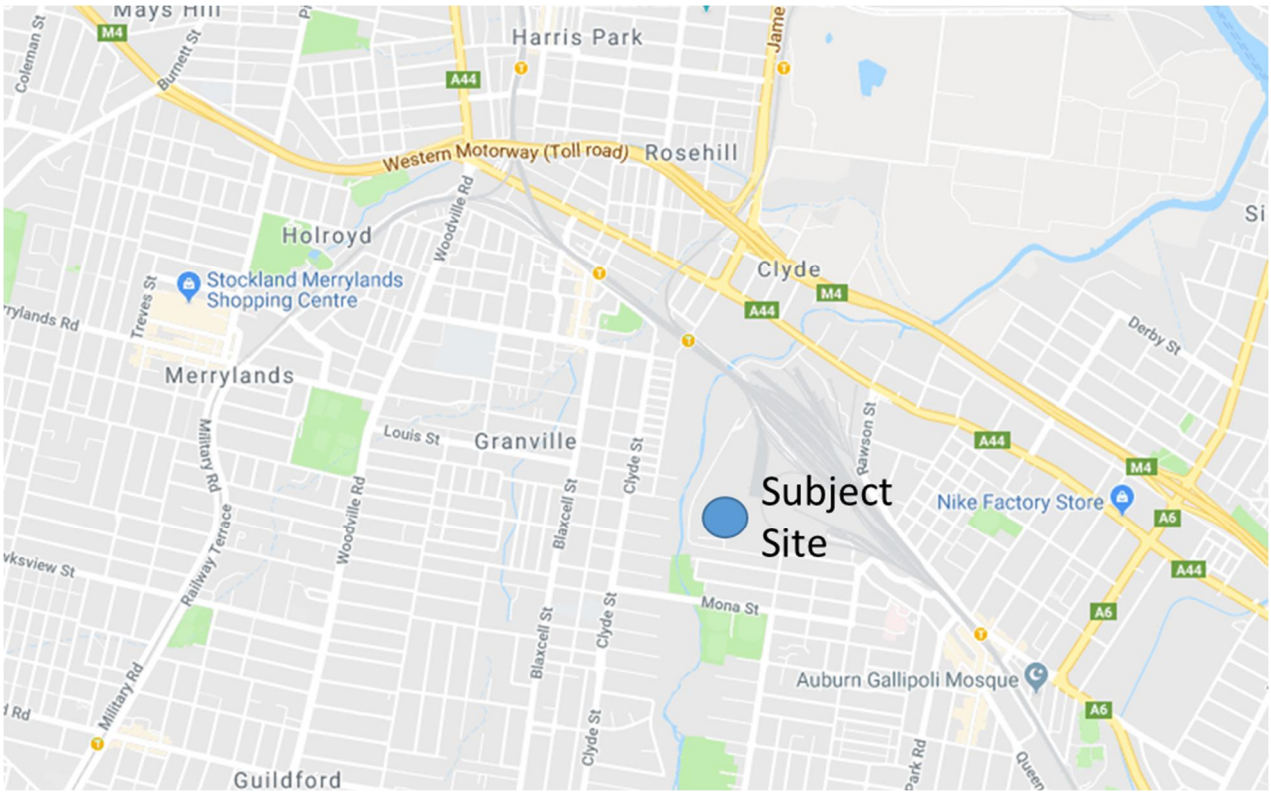
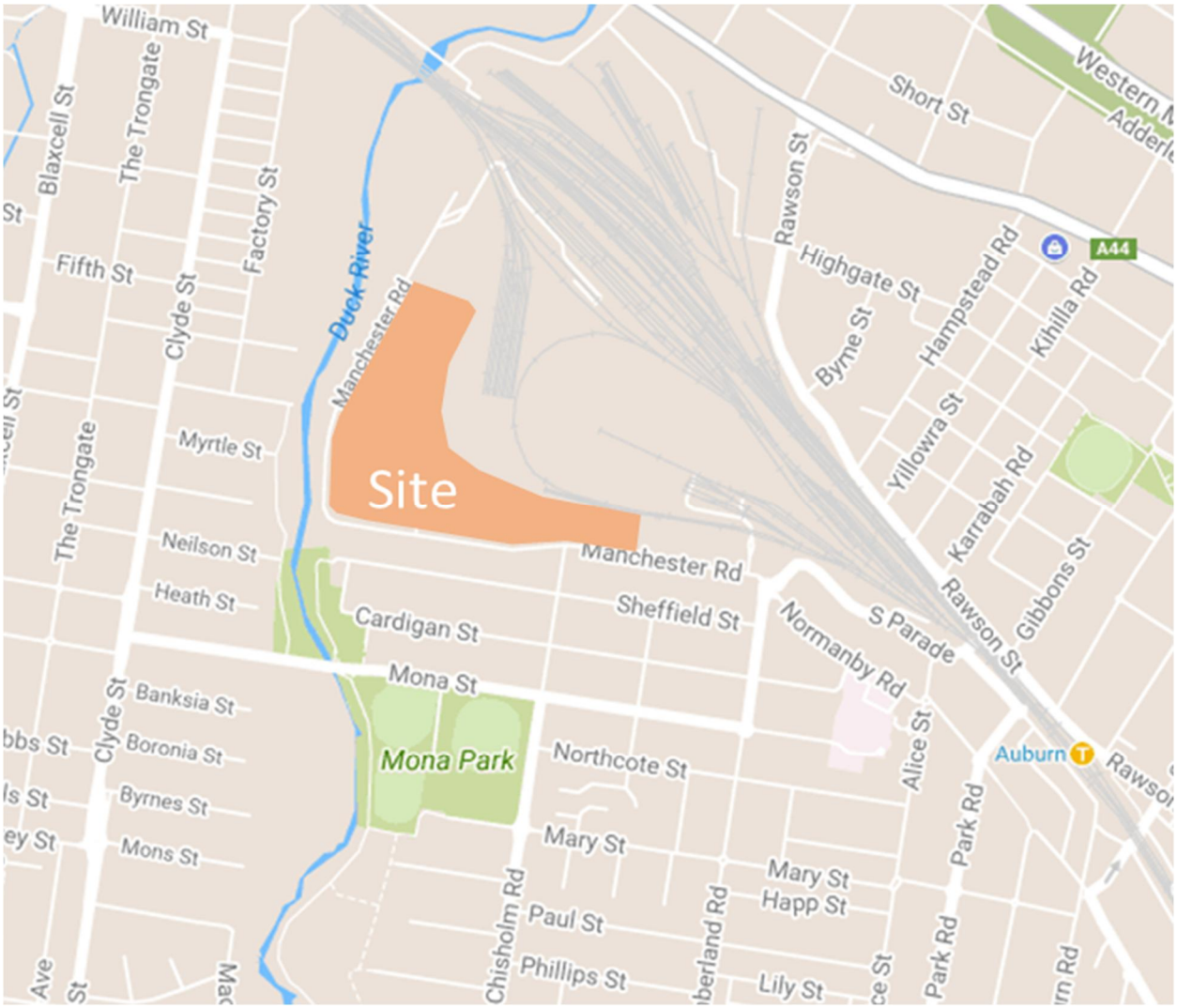


Figure 2.2 : Existing road network



The roads that connect to the site are:

Manchester Road - a local road owned by Sydney Trains with a right of way to the land owned by PAYCE. It has a posted speed limit of 20km/h with 'no parking' restrictions on both sides of the road.

Chisholm Road - a local collector road connecting Manchester Road to Regents Park and is one of the main north south collector streets. It has a speed limit of 50km/h with parking allowed on both kerb side with one lane in each direction.

Mona Street - a local collector road that provides one of the few east-west crossings over the Duck River. It has a posted speed limit of 50km/h and generally has one lane in each direction.

The Crescent / South Parade - a collector road that links Manchester Road to Rawson Street via a bridge over the railway. It is one the main north-south links over the railway.

Rawson Street - a major collector road that links Parramatta Road with St Helliers Road (A6) and runs parallel to the railway line. It is generally two lanes in each direction however on-street parking is allowed in some sections.

Clyde Street - a north-south collector road west of the Duck River that runs parallel to Chisholm Road and perpendicular to Mona St. It provides the main route through to Clyde Station and Granville from the site.

2.4 Traffic volumes

The data for the project came from various sources. The main count data was collected was collected on 13 September 2017 at the following locations:

- Manchester Road, Cumberland Road and Normandy Street Intersection
- Cumberland Road and Mona Street Intersection
- South Parade and Rawson Street Intersection
- Mona Street and Clyde Street Intersection

These counts included morning and evening traffic peaks from 6:00am – 10:00pm and 3:00pm – 7:00pm on a weekday.

Additional traffic counts were also collected 24 July 2018 at:

- Wellington Road / Chisholm Road
- Chisholm Road / Mona Street
- Redfern Street / Clyde Street
- Hudson Street / Clyde Street

These surveys covered the 6:30am – 9:30am and 3:30pm – 6:30pm and also included queue length surveys at Chisholm Road / Mona Street.

A count was undertaken in Manchester Road in May 2018 after the opening of the rail maintenance hub that covered 6:00am – 10:00am and 3:00pm.

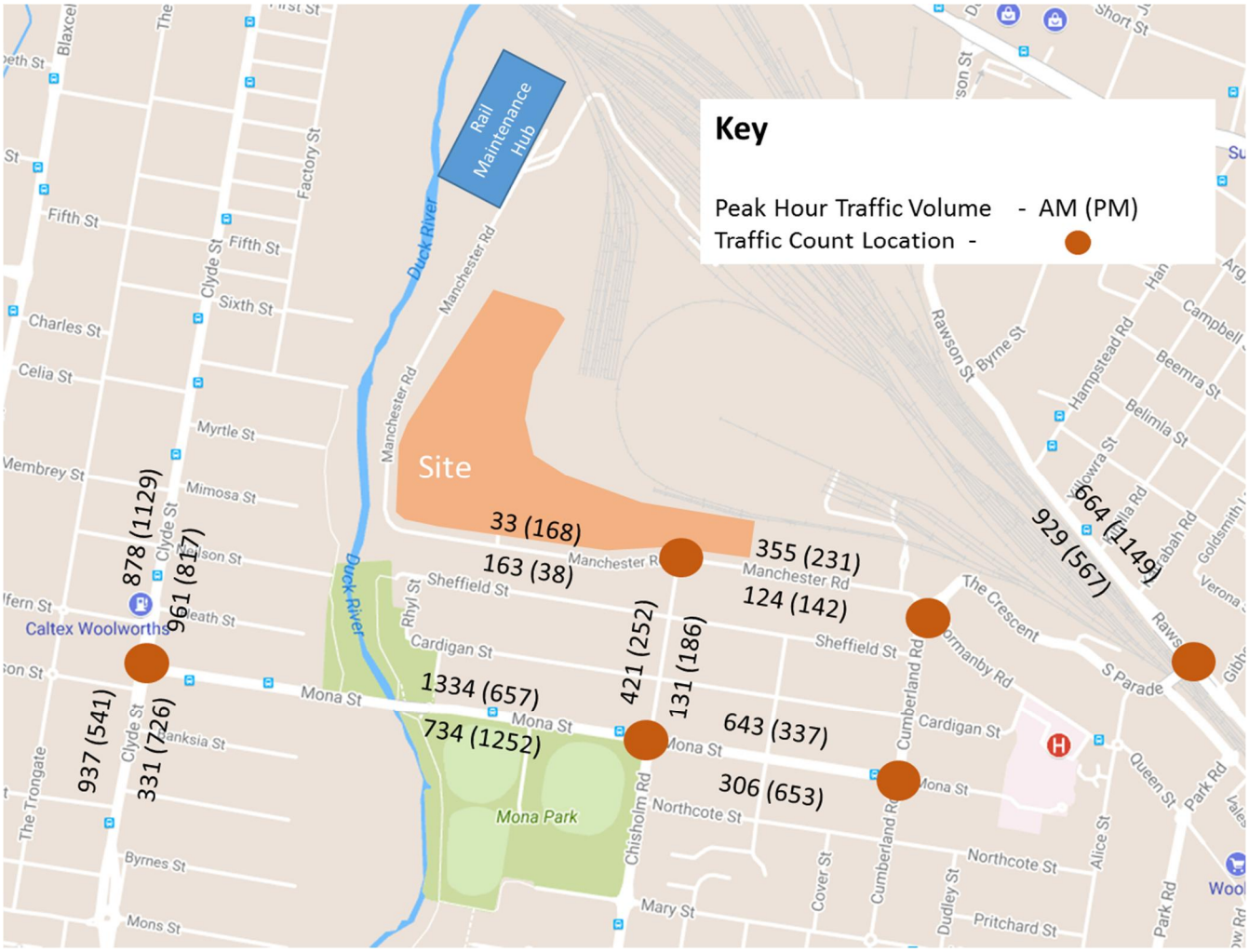
In addition to this data, intersection counts are also available from earlier surveys that were undertaken on Wednesday 8 October 2014 and Thursday 30 October 2014 at the following sites:

- Manchester Road and Chisholm Road Intersection[1]
- Mona Street and Chisholm Road Intersection
- Clyde Street and Mona Street Intersection
- Manchester Road, Cumberland Road and Normandy Street Intersection
- South Parade and Alice Street Intersection[1]
- The Crescent and South Parade Intersection[1]
- Rawson Street and The Crescent Intersection

The midblock traffic volumes for the peak time periods are shown in Figure 2.3.

[1] Data from these sites was used only to supplement locations where count data was not available. A consistency check has been undertaken with surveys at more recent locations.

Figure 2.3 : Peak hour midblock traffic volumes



2.5 Existing traffic generation

Traffic counts undertaken indicate that the traffic volumes on Manchester Road are relatively low. The volumes into and out of Manchester Road in the morning and afternoon peak was:

- Morning Peak Hour - 163 veh /h into the site and 33 veh/h out of the site (8:00am – 9:00am)
- Evening Peak Hour – 38 veh/h into the site and 168 veh/h out of the site. (5:00pm – 6:00pm)

This includes access to the rail site, BlueScope Steel and residential buildings along Manchester Road. Most of this traffic is associated with the rail maintenance hub.

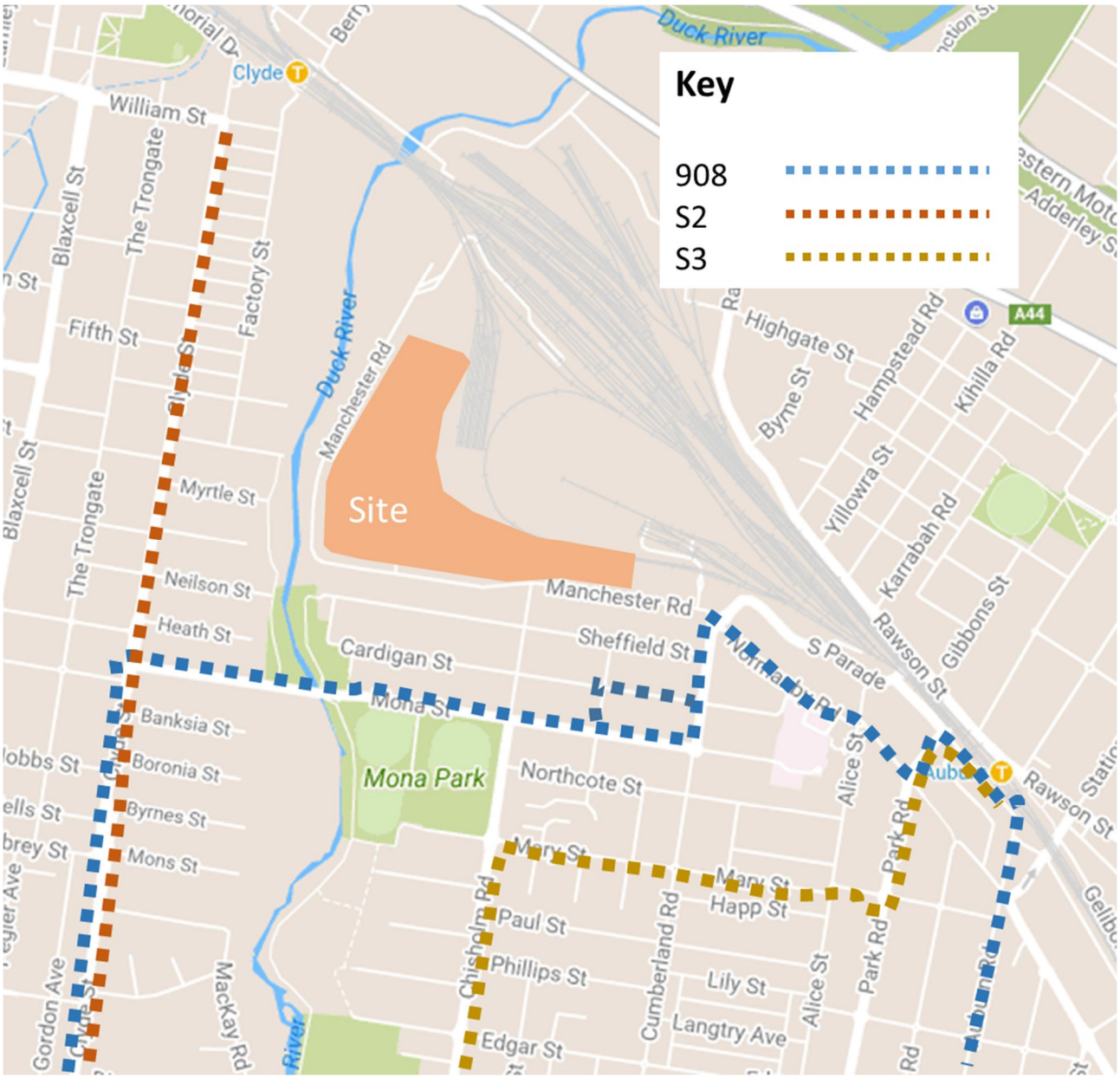
2.6 Vehicular access

The site has access from Manchester Road. The existing developments on the site are accessed via driveway and internal road from Manchester Road. Manchester Road also provides access for the Sydney Trains site.

2.7 Public bus routes

The local bus routes are shown in Figure 2.4. Routes S2 and S3 operate only between the peak commuter periods.

Figure 2.4 : Bus routes



The closest bus service to the site is the 908 route. It operates from Bankstown to Merrylands via Birrong and Auburn. The buses are operated by Busways and have approximately 30 – 60 minute headways during peak periods. There are bus stops located approximately 200m walking distance south of the site on Cumberland Road and Mona Street. The frequency of buses is provided in Table 2.1.

Table 2.1 : Bus route frequency

Bus Route	Morning Peak	Evening Peak
908	2 per hour – Westbound 2 per hour - Eastbound	2 per hour Westbound 1 Per hour Eastbound

The S2 bus route operates between Granville and Sefton Stations with six services per day in each direction while S3 route runs between Chisholm Road and Auburn Station four times per day in each direction.

2.8 Trains

Clyde Station and Auburn Station are the closest rail stations to the site. Both Stations are more than 800m from the majority of the site. The site is considered to be walkable distance to Clyde Station and Auburn Station requiring approximately 15 - 20 minutes to walk to either Clyde Station or Auburn Station.

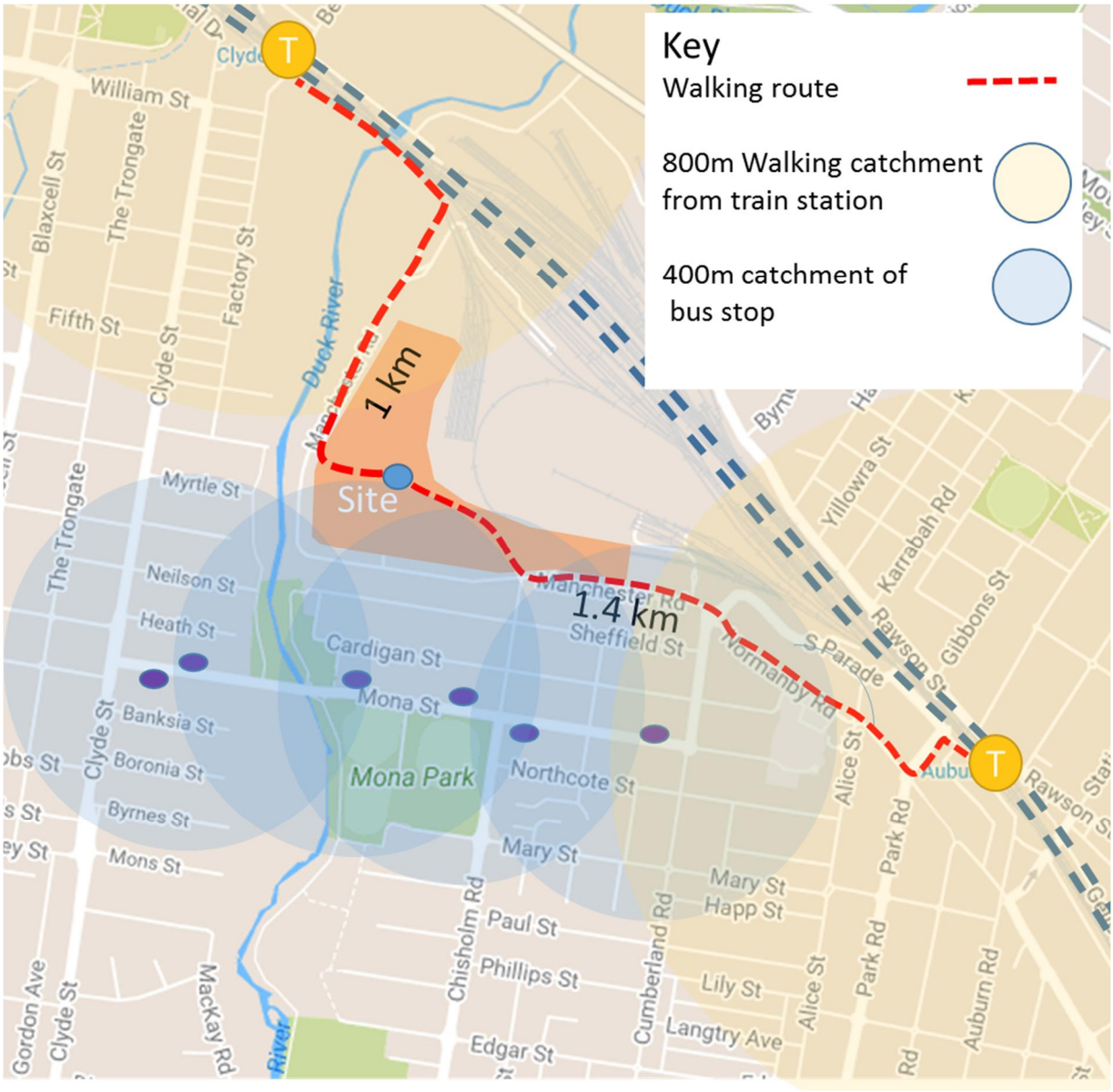
Clyde Station is about 1km walking distance from the centre of the site. There is a public walkway that runs parallel to the railway line and provides walking access between the site and the station and a crossing of the Duck River. There are currently up to 11 services per hour that stop in the peak hour. A new timetable was adopted in November 2017. The changes to services included

- T1 Western Line services remained the same westbound (peak of 4 per hour)
- T1 North Shore services were removed eastbound (peak of 5 per hour dropped)
- T2 Inner West Services were added (peak of 8 per hour added)
- Carlingford Line will be discontinued (peak of 2 services per hour dropped) when Parramatta Light Rail construction commences

Auburn Station is approximately 1.4km walking distance from the centre of the site with access along public footpaths. There are approximately 18 services stopping at Auburn Station per hour. The peak stopping pattern in the evening peak is:

- T1 line Eastbound (4 per hour)
- T1 Line Westbound (4 per hour)
- T2 Inner West Line Eastbound (4 per hour)
- T2 Inner West Line Westbound (6 per hour)

Figure 2.5 : Train station locations



2.9 Active transport

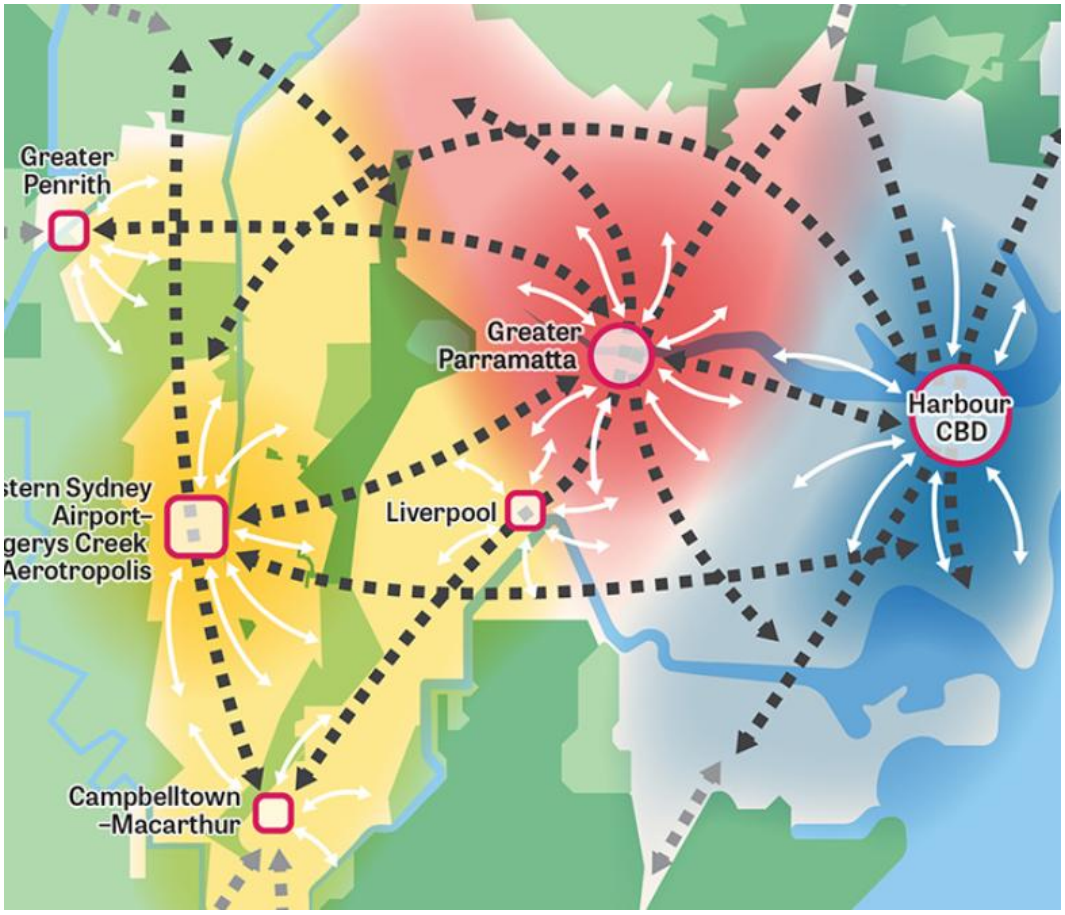
The site has access to existing off-road cycle routes along the Duck River. An extension of this shared path to the north has been identified within the bike plan. There are currently no bicycle routes marked that connect the site to the nearest train stations. There are walking connections to Auburn Station along the existing road side footpaths and a path connecting the site to Clyde Station.

Figure 2.6 : Bicycle and pedestrian paths

2.10 30 Minute cities

The Greater Sydney Commission has released a regional plan for Sydney that centres around the concept of a metropolis of three cities. Part of the vision of this plan is to allow most residents to live within 30 minutes of their jobs by public and active transport. The plan aims to place more emphasis on increasing the number of jobs with the Parramatta CBD.

Figure 2.7: Greater Sydney Regional Plan



Consideration of this 30-minute city concept has been made in the development of the proposed site, which currently has the potential for access to local and regional centres within this 30-minute catchment. Key centres that could be reached within 30 minutes include:

- Parramatta CBD, the key metropolitan city centre of the central city
- Auburn, a key local centre providing shopping, public transport and community services
- Granville, a local employment centre and key transport hub

Access to these centres is shown in in Tables 2.2 to 2.5. It shows that journeys from the site by public transport to Parramatta by public transport can be achieved in under 30 minutes.

Table 2 2: Journey To Parramatta

Mode	Time
Walk to Auburn Station	17 minutes
Wait for train	3 minutes
Train to Parramatta (T2)	9 minutes
Total journey time	*29 minutes*

Table 2 3: Journey to Sydney CBD (Town Hall)

Mode	Time
Walk to Auburn Station	17 minutes
Wait for train	3 minutes
Train to Town Hall (T2)	46 minutes
Total journey time	*56 minutes*

Table 2 4: Journey to Liverpool

Mode	Time
Walk to Auburn Station	17 minutes
Wait for train	3 minutes
Train to Town Hall (T2)	25 minutes
Total journey time	*45 minutes*

Table 2 5: Journey to Macquarie Park

Mode	Time
Walk to Auburn Station	17 minutes
Wait for train	3 minutes
Train to Strathfield (T2)	10 minutes
Strathfield to Epping (T1)	20 minutes
Train to Macquarie Park	17 Minutes
Total	*1 hour 6minutes*

Access to local centres of Auburn and Granville for shopping, community services or work can be made by walking to Auburn within 20 minutes by walk and Granville within 22 minutes by walk and train. A breakdown of trips to local centres is shown in Table 2.6 and Table 2.7.

Table 2 6: Journey to Auburn

Mode	Time
Walk to Auburn Centre	17 minutes
Total	17 Minutes

Table 2 7: Journey to Granville

Mode	Time
Walk to Auburn Station	17 minutes
Wait for train	3 minutes
Tran to Granville	2 minutes
Total	22 Minutes

Analysis of public and active transport services around the site shows that people living at the site would have access to jobs within 30 minutes by active and public transport, fulfilling the vision of the 30-minute city.

Future construction of Sydney Metro West would provide a high speed and high frequency link between Parramatta and Sydney Olympic Park. The Sydney Metro West is expected to be built by the second half of the 2020s. Sydney Metro West would provide opportunities to improve services on the existing T1 and T2 train lines by providing additional capacity and opportunity to provide more services that stop at Auburn Station, further increasing the accessibility of the site by public transport

3. The proposal

3.1 Description of the development

The proposed rezoning is to allow for a mixed-use development comprising residential, retail and employment components. The residential component is planned to include 1,150 high density residential dwellings. This is assumed to consist of:

- Studio Apartments: 2%
- 1 Bedroom: 26%
- 2 Bedroom: 68%
- 3 Bedroom: 4%

The retail is proposed to be 1,000m^2 Gross Floor Area (GFA) for small speciality shops and we have assumed that the Gross Leasable Floor Area (GLFA) is 85% of the GFA.

The proposal in includes an employment component to the development that would include industrial business park and commercial offices. Offices would comprise 7,500m^2 of GFA while the industrial business park would be 75,000m^2 of GFA.

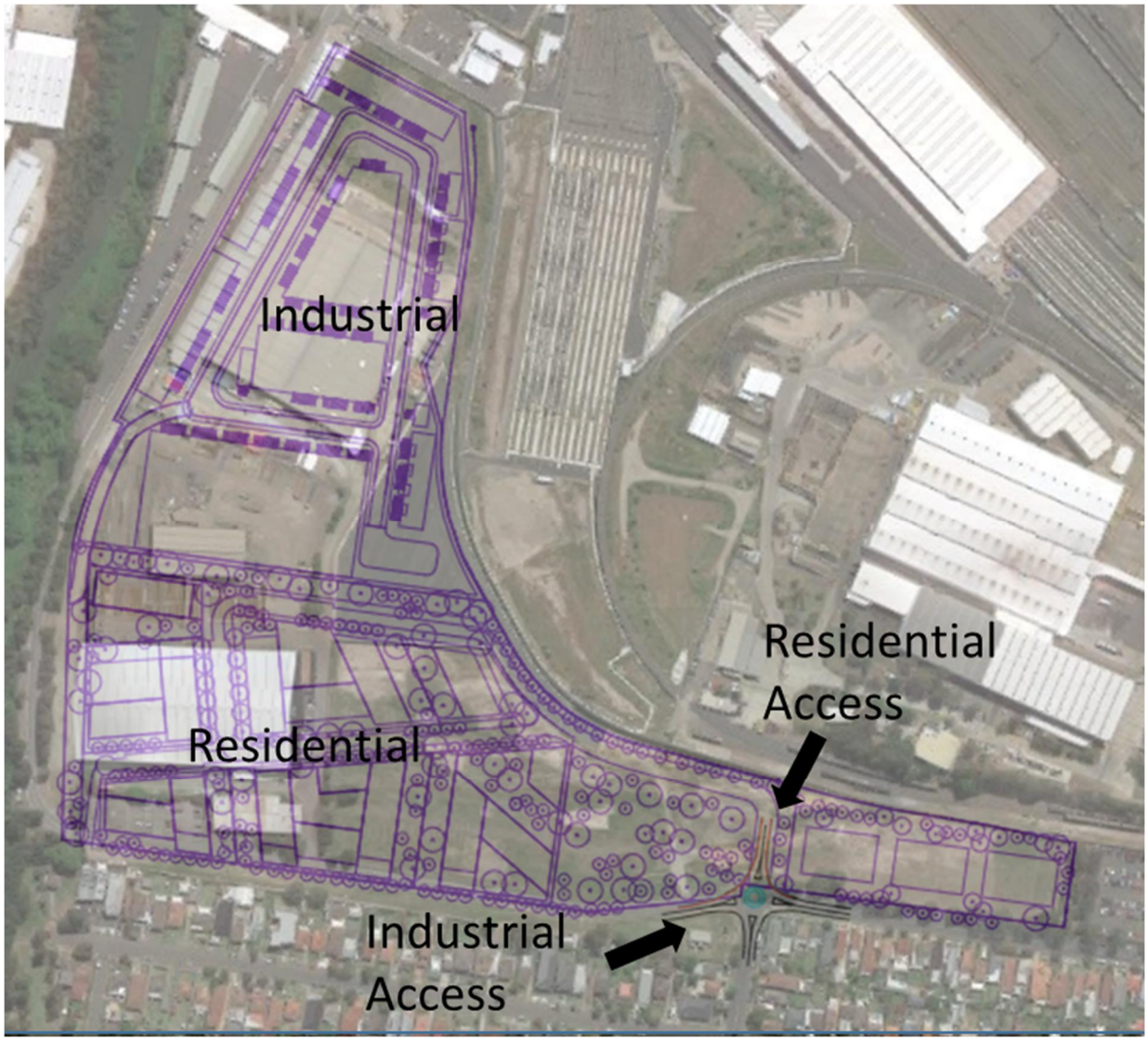
There would be other elements of the development that have been assumed to primarily service the development including a community centre and pubic park land. These are expected to generate trips that are contained within the development.

3.2 Vehicular access and internal road network

Access to the residential and retail components of the development would be via a new access road that would align with Chisholm Road. The intersection of Chisholm Road and Manchester Road is proposed to be converted to a roundabout to facilitate traffic movements as part of the access arrangements.

The industrial components of the development would access the site from the existing Manchester Road. The access and proposed site layout are shown in Figure 3.1.

Figure 3.1: Access arrangement



3.3 Active transport

The proposed development would provide connections to the existing bicycle and pedestrian network. Auburn Council bike plan (no Cumberland Council) identified a potential bicycle route that would follow the Duck River to the north crossing the railway (see Figure 3.2). The developer would support this connection to encourage walking and cycling and better connectivity to rail stations.

Figure 3.2: Proposed connection across railway

3.4 Parking

The proposed parking is to be provided to meet the Cumberland Council (previously Auburn Council) requirement for a minimum level of car parking. The minimum parking supply as stipulated in the Auburn DCP are provided in Table 3.1.

Table 3.1 : Minimum Parking Provision

	Dwellings / Floor Area	Parking Rates	
		Rate	Car Spaces
Residential			
Studio	22	1	22
I Bed	294	1	294
2 Bed	784	1	784
3 Bed	50	2	100
Visitor	(1150)	0.2	230
Sub total			*1430*
Employment and retail			
Industrial (office)	15,000 m^2	1 per 40 m^2	375
Industrial (warehouse)	60,000 m^2	1 per 300 m^2	200
Office	7,500 m^2	1 per 40 m^2	188
Retail	850 m^2	6.1 (per 100 m^2)	49
Site Total			**2242**

GLFA assumes 85% GFA

4. Transport impacts

This section of the report provides the assumptions, estimation of traffic and the forecast impacts on the road network as well as potential options to mitigate the impacts of increased development traffic on the surrounding road network.

4.1 Traffic generation

The future traffic generation has been based on the available data and the Roads and Maritime, Guide to Traffic Generating Developments Technical Direction (2013). For the purpose of the analysis it has been assumed that the existing site generates only a small amount of traffic as identified in the traffic surveys so that the traffic generation has been added to the existing traffic volumes.

4.1.1 Residential traffic generation

Traffic generation rates for the residential component of the development has been derived from Roads and Maritime, Guide to Traffic Generating Developments Technical Direction (TDT 2013 / 04a). As only part of the subject site is within the typical walking catchment for a rail station (800m) and it is not located within a major centre thus, the average Sydney Rate is not considered appropriate in this instance. Three sites surveyed that have some of the same characteristics, based on their proximity to public transport, are considered to be:

- Rockdale – 11km from Sydney CBD – 17km from Parramatta
- Parramatta – 19km from Sydney CBD
- Liberty Grove – 11km from Sydney CBD

Table 4.1 : Residential trip rates comparison (trips per dwelling)

Site	Morning Peak	Evening Peak	Distance from Sydney CBD (km)
Rockdale	0.32	0.18	11
Parramatta	0.27	0.12	19
Liberty Grove	0.28	0.41	11
Average	*0.29*	*0.24*	-
300 Manchester Road			17
Sydney Average	0.19 (0.07 – 0.32)	0.15 (0.06 – 0.41)	-

The following residential trip generation rates have therefore been adopted:

- 0.29 veh/dwelling (morning peak hour)
- 0.24 veh/dwelling (evening peak hour)

Council have indicated that they agree with these rates.

4.1.2 Industrial traffic generation

The employment area of the development is assumed to take the form of a business / industrial park. The traffic generation rate has been adopted form the RMS Guide to traffic generating developments.

- 0.52 Trips per 100m^2 of GFA (Morning Peak)
- 0.56 Trips per 100m^2 of GFA (Evening Peak)

4.1.3 Commercial office traffic generation

The traffic generation rate for the commercial office was adopted directly from the Roads and Maritime technical direction (TDT 2013 /04).

- 1.6 per 100m^2 of GFA (Morning Peak)
- 1.2 per 100m^2 of GFA (Evening Peak)

4.1.4 Retail traffic generation

The rates for the retail development have been based on the Roads and Maritime, Guide to Traffic Generating Developments Technical Direction (TDT 2013 / 04a). As the retail component is less than 10,000m^2 (GLFA) the rate of 12.3 veh / 100m^2 has been adopted for the evening peak.

A rate for the morning peak period is not provided in the technical direction. However, the data provided in the appendix allows an estimate rate for the morning peak period to be assumed. The raw survey results provided in the appendix indicate that the morning peak traffic generation for retail developments is approximately half the evening peak. Therefore, the following rates have been adopted:

- 12.3 veh /h per 100m^2 GLFA (Evening Peak)
- 6.1 veh / h per 100m^2 GLFA (Morning Peak)

It has been assumed that up to 20% of retail trips would be contained within the development.

4.1.5 Total traffic generation

The estimated traffic generation is shown in Table 4.2 and Table 4.3 present the estimated traffic generation for the morning and evening peaks. The adjusted traffic generation represents the discount as a result of trip containment between retail and employment land use. The adjusted traffic generation is provided in the 'reduced' column.

Table 4.2 : Morning peak traffic generation

Land Use	Units / GFA / GLFA	Generation Rate	Traffic Generation	Reduced
Residential	1150	0.29 per dwelling	334	334
Retail	800 m^2	6.1 per 100m^2	49	39
Industrial business park	75,000 m^2	0.52 per 100m^2	390	390
Office	7,500 m^2	1.6 per 100m^2	120	120
Total			**892**	**883**

Table 4.3 : Evening peak traffic generation

Land Use	Units / GFA / GLFA	Generation Rate	Traffic Generation	Reduced
Residential	1150	0.24 per dwelling	276	276
Retail	800 m^2	12.3 per 100m^2	98	79
Industrial business park	75,000 m^2	0.56 per 100m^2	420	420
Office	7,500 m^2	1.2 per 100m^2	90	90
Total			**884**	**865**

4.1.6 Directional split

It is assumed directional split for traffic generated by the site is provided in Table 4.4.

Table 4.4 : Directional split assumptions

	Morning Peak		Evening Peak	
Land Use	To the Site	From the Site	To the Site	From the Site
Retail	50%	50%	50%	50%
Employment	80%	20%	20%	80%
Dwellings	20%	80%	80%	20%

4.2 Traffic distribution and assignment

An assessment of the journey to work data has been used to estimate the traffic distribution. To obtain this estimated data, adjacent travel zones has been aggregated to get an estimate of where people are travelling to and from work.

From this data the following assignment has been assumed:

- 28% from and to the Parramatta, Merrylands and Guildford north
- 6% from and to Auburn North
- 31% from and to the CBD East
- 20% from and to Strathfield South-East
- 12% from and to Bankstown South
- 4% from and to Fairfield Southwest

The assumed assignment routes are shown in Figure 4.1. Because of the limited access to the site due to physical barriers such as Duck River to the west and rail land to the north, access to the site is only feasible from two roads Manchester Road and Chisholm Road irrespective of where trips come or go to.

Figure 4.1 : Assumed traffic assignment

4.3 Intersection performance

The following section provides:

- modelling outputs and assessment of the impacts on the road network
- description of proposed measures to mitigate the traffic constraints
- modelling outputs of the proposed mitigation options.

The key intersections have been modelled using Sidra Intersection modelling software. These intersections include:

- Mona Street / Clyde Street (Network model including Hudson Street and Redfern Street)
- Mona Street / Chisholm Road
- Manchester Road / Cumberland Road
- Rawson Street / The Crescent (Network model including Alice Street and South Parade)
- Manchester Road / Chisholm Road
- Chisholm Road / Wellington Road

4.3.1 Assessment criteria

The assessment of intersection performance is based on criteria outlined in and defined in the *Guide to Traffic Generating Developments* (Roads and Traffic Authority 2002). The average delay assessed for signalised intersections is for all movements, and for priority (sign-controlled) intersections is for the worst movement, and is expressed in seconds per vehicle.

Table 4.5 : LoS criteria for intersections

LoS	Average delay per vehicle (seconds / vehicle)	Traffic signals and roundabouts	Give way and stop signs
A	Less than 15	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	Operating near capacity	Near capacity, and accident study required
E	57 to 70	At capacity; at signals, incidents will cause delays. Roundabouts require other control mode	At capacity, requires other control mode
F	Over 70	Extra capacity required	Extreme delay, traffic signal or other major treatment required

Source: Guide to Traffic Generating Developments (RMS, version 2.2, 2002)

4.3.2 Modelling approach

The approach to the modelling has been to:

1) model the existing conditions under the existing traffic volumes and road configuration.
2) Testing a 'Do minimum' scenario that includes the existing road network and the traffic generated by the proposed development.
3) Testing of a road upgrade scenario that includes the development generated traffic and proposed intersection upgrade.

4.3.3 Model validation

Additional data was collected in order to validate the base traffic models as requested by Council. This included queue length surveys and signal timing data. This was undertaken for the critical intersections where Council were concerned with the model validation at:

- Mona Street / Chisholm Road
- Mona Street / Clyde Street

4.3.4 Mona Street/ Chisholm Road

A comparison of modelled and observed phase timings is shown in Table 4 6.

Table 4 6: Mona Street and Chisholm Road intersecton phase time validation

		Phase A (seconds)	Phase B (seconds)	Phase C (seconds)	Cycle time (seconds)
Morning Peak	Observed	61	24	42	130
	Modelled	57	27	41	120
Evening Peak	Observed	60	27	40	127
	Modelled	57	32	41	130

The models have been calibrated to reflected the observed traffic signal timing and show a strong correlation to the observed signal timing.

Queue length data was also compared to the modelled queues as shown in Table 4 7. The queue data was recorded at the change of the signal phase and the reported queue lengths are the maximum observed. The modelled queue length is based on the 95th percentile which is a close match to the maximum queues observed on site.

Table 4 7: Mona Street and Chishom Road queue lengths (morning peak)

	Lane	Observed (max queue) number of vehicles	Modelled (95th percentile queue) number of vehicles
Northern approach	Lane 1	2	2
	Lane 2	6	5
Eastern approach	Lane 1	2	2
	Lane 2	11	11
Southern approach	Lane 1	12	14
	Lane 2	6	5
Western approach	Lane 1	12	30
	Lane 2	11	29

The model generally shows a strong correlation with the observed queues but overestimates queues on the western approach to the intersection.

Queue lengths have been calibrated to the evening peak as shown in Table 4.8.

Table 4 8: Mona Street and Chisholm Road queue lengths (evening peak)

	Lane	Observed (max queue)	Modelled (95th percentile queue)
Northern approach	Lane 1	3	4
	Lane 2	8	9
Eastern approach	Lane 1	4	14
	Lane 2	21	17
Southern approach	Lane 1	18	23
	Lane 2	7	6
Western approach	Lane 1	12	11
	Lane 2	12	11

The evening peak model shows a good correlation to the observed queue lengths.

4.3.5 Mona Street / Clyde Street

The modelled and observed signal timings have been compared in Table 4 9.

Table 4 9: Mona Street / Clyde Street Intersection phase time validation

		Phase A (seconds)	Phase B (seconds)	Phase C (seconds)	Cycle time (seconds)
Morning Peak	Observed	27	25	37	99
	Modelled	22	37	41	100
Evening Peak	Observed	32	22	45	99
	Modelled	36	16	48	100

The data shows that the models accurately reflect the observed signal timings.

4.3.6 Existing conditions

The results of the modelling with the existing traffic volumes are shown in Table 4.10.

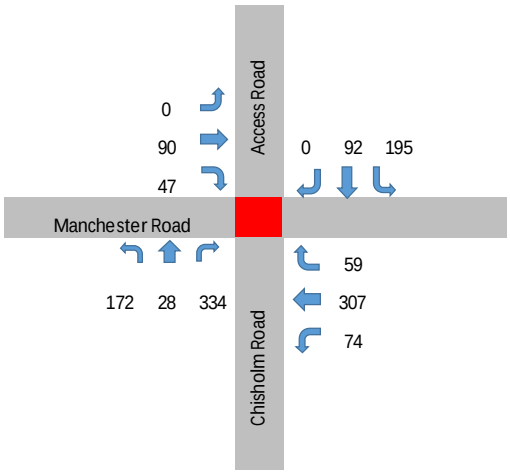
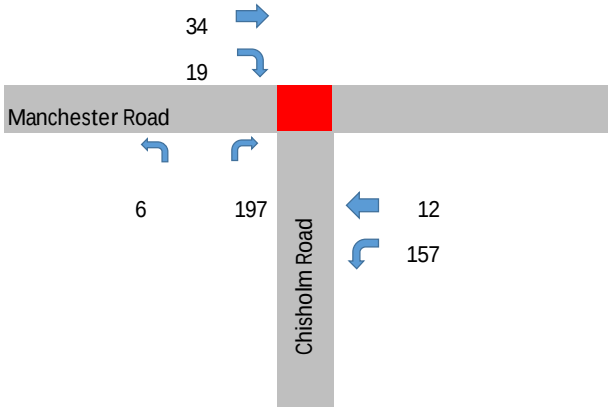
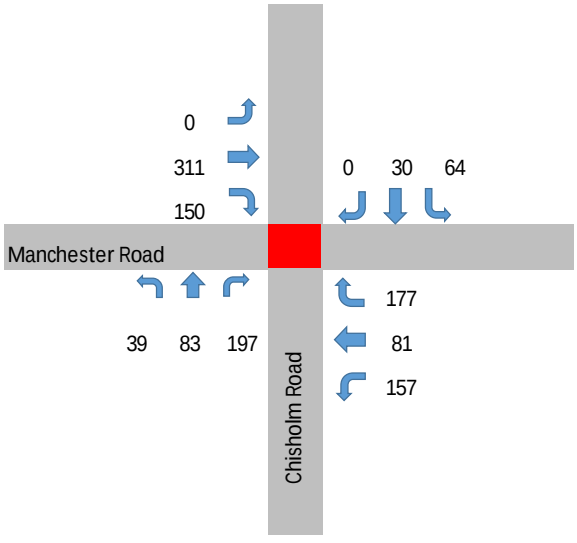
Table 4.10 : Existing intersection modelling results

Intersection		LoS	Average Delay (Sec)	Degree of Saturation
Rawson Street / South / Parade	Morning	C	40	0.91
	Evening	D	50	0.92
South Parade / Railway Bridge	Morning	A	6	0.44
	Evening	A	9	0.45
South Parade / Alice Street	Morning	C	33	0.92
	Evening	A	14	0.67
Mona Street / Chisholm Road	Morning	B	27	0.82
	Evening	B	26	0.84
Manchester Road / Cumberland Road	Morning	B	16	0.56
	Evening	A	11	0.47
Mona Street / Clyde Street	Morning	C	32	0.90
	Evening	D	44	0.99
Clyde Street / Redfern Street	Morning	B	25	0.93
	Evening	F	76	1.05
Clyde Street / Hudson Street	Morning	A	7	0.45
	Evening	A	6	0.33
Manchester Road / Chisholm Road	Morning	A	9	0.21
	Evening	B	15	0.92
Chisholm Road / Wellington Road	Morning	D	50	.98
	Evening	D	49	.96

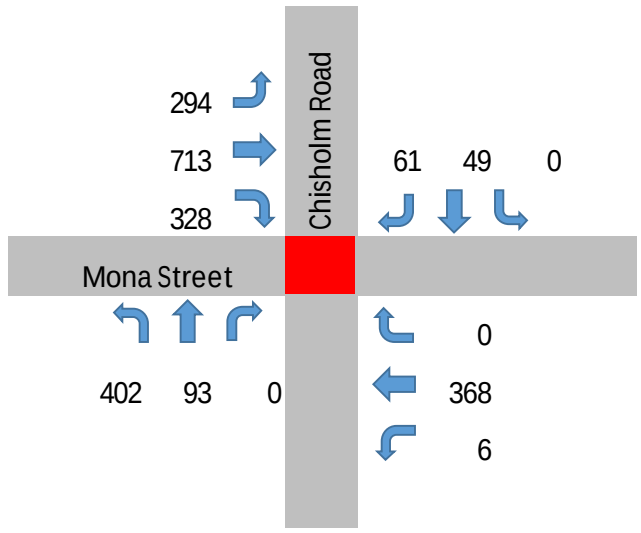
4.3.7 Additional traffic volumes

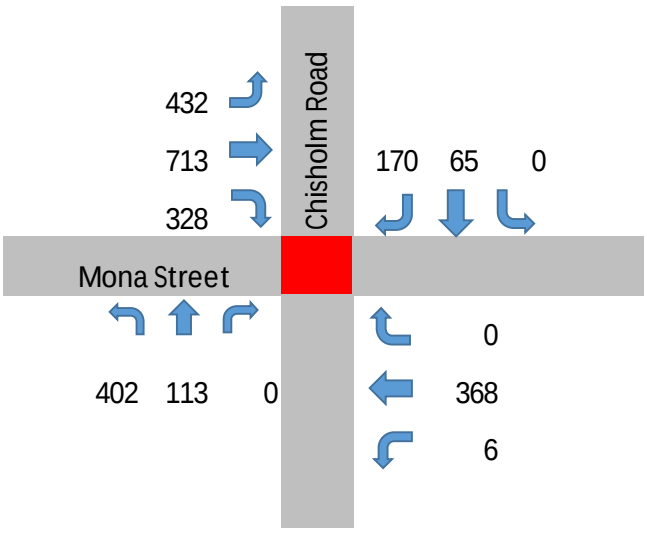
The forecast change in traffic volumes are shown in Table 4 11. These changes in volume are estimated from the traffic generation estimated in section 4.1.5 and the traffic distribution in Figure 4.1. The resulting increases in traffic affect routes from the site to Clyde Street and from the site to Rawson Street. Traffic distribution south to Wellington Street was relatively low with forecasts expected to be within the day to day variation in traffic volumes.

Table 4 11: Forecast traffic volumes

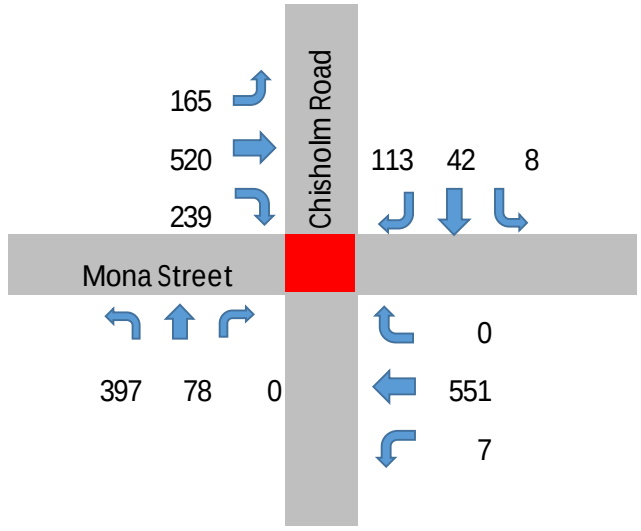
Existing Volumes	Forecast Volumes
Manchester Road and Chisholm Road - Morning Peak Hour	
	
Manchester Road and Chisholm Road - Evening Peak Hour	
	

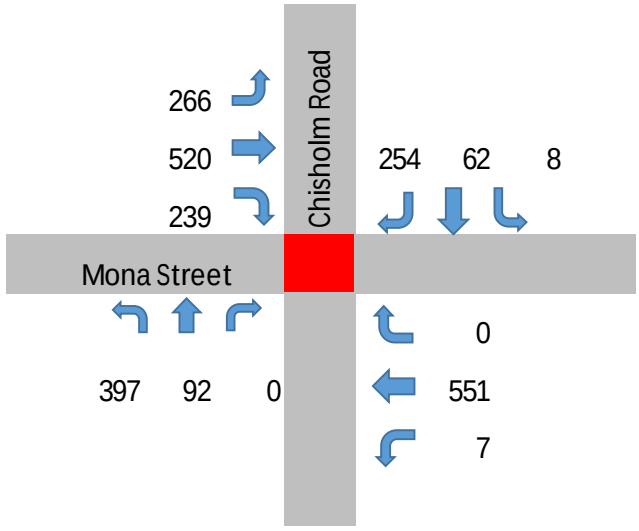
Mona Street and Chisholm Road – Morning Peak Hour



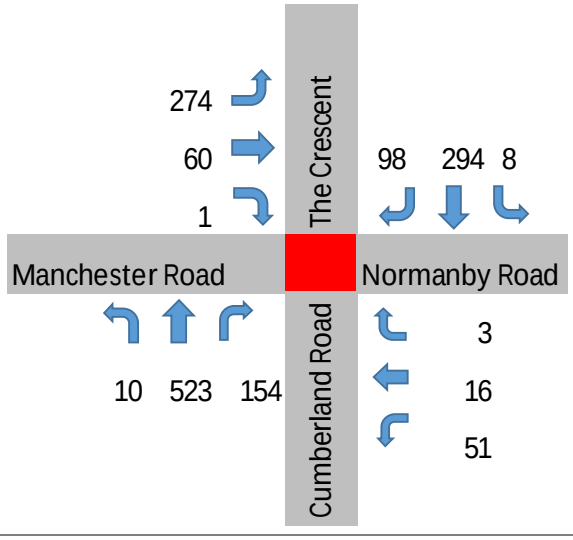


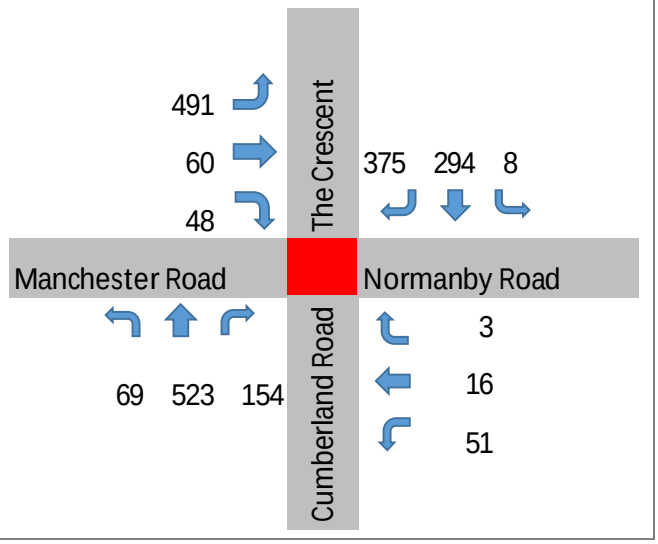
Mona Street and Chisholm Road – Evening Peak Hour



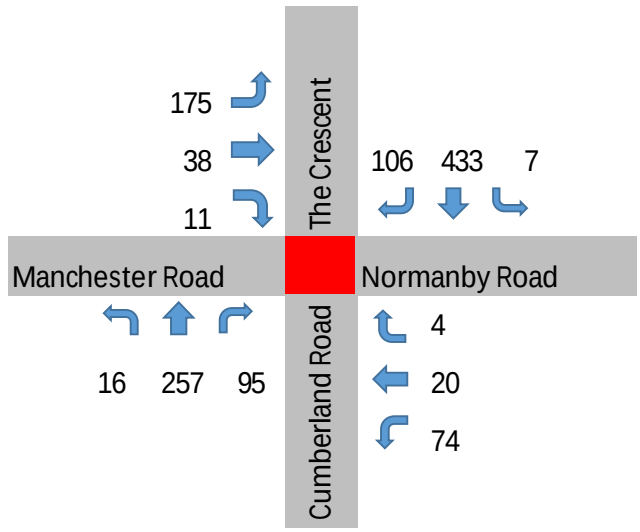


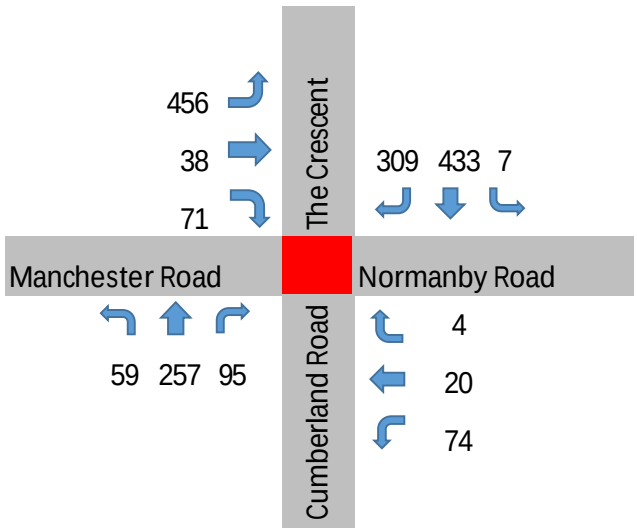
Manchester Road and Cumberland Road - Morning Peak Hour





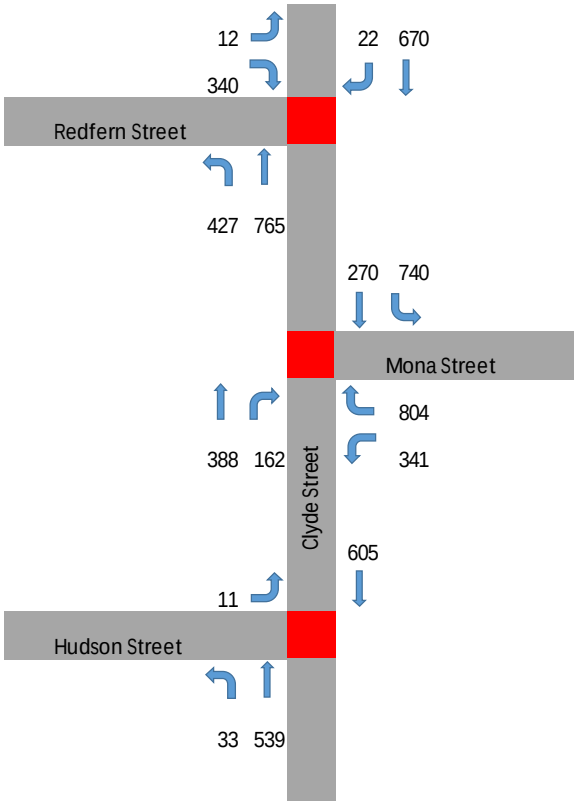
Manchester Road and Cumberland Road - Evening Peak Hour



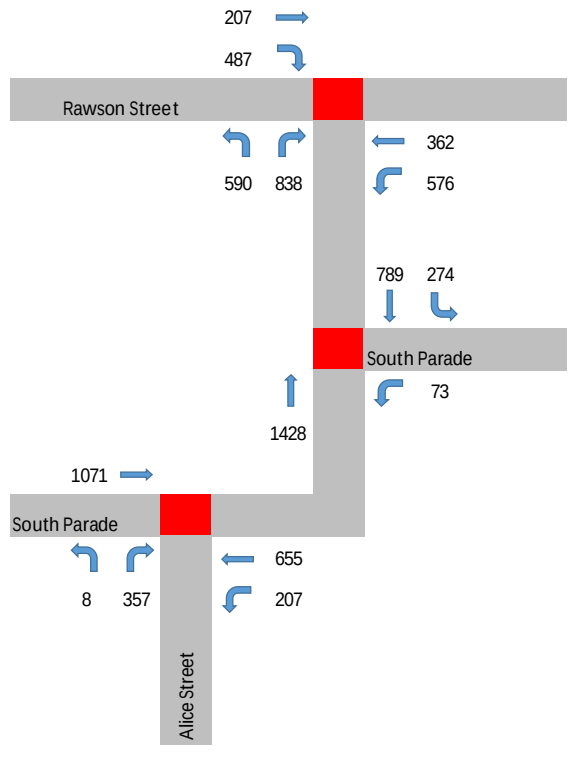


Mona and Clyde Street Network – Morning Peak Hour

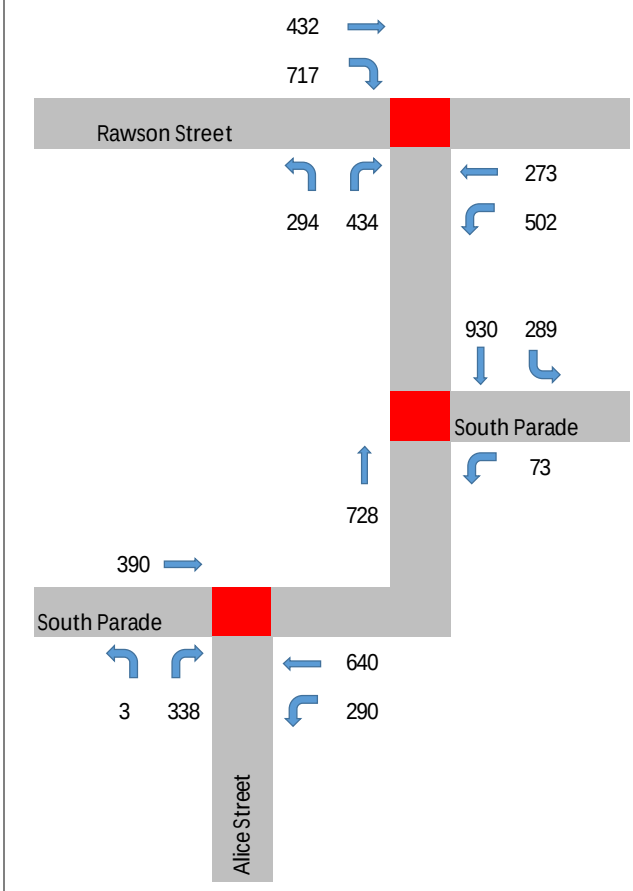
Mona and Clyde Street Network– Evening Peak Hour

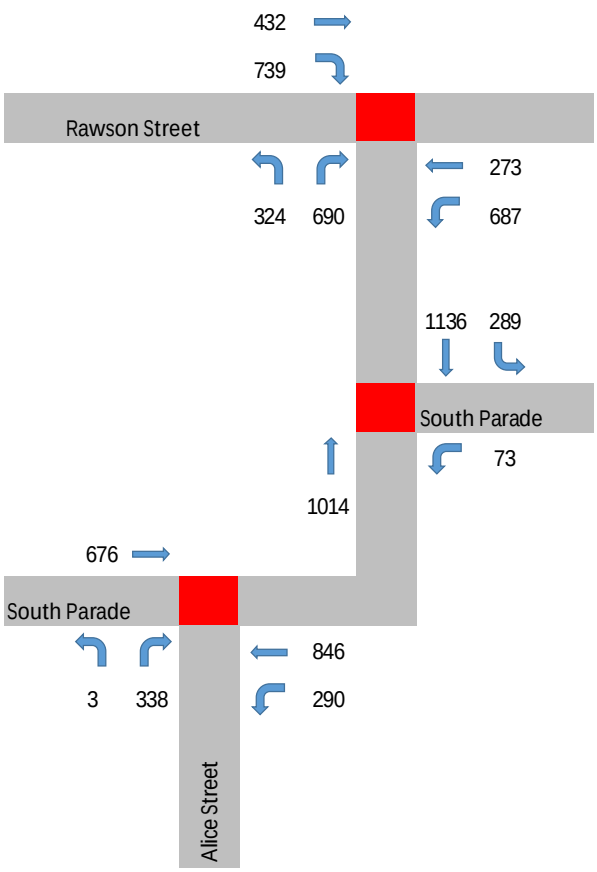


Rawson Street and South Parade Network – Morning Peak Hour

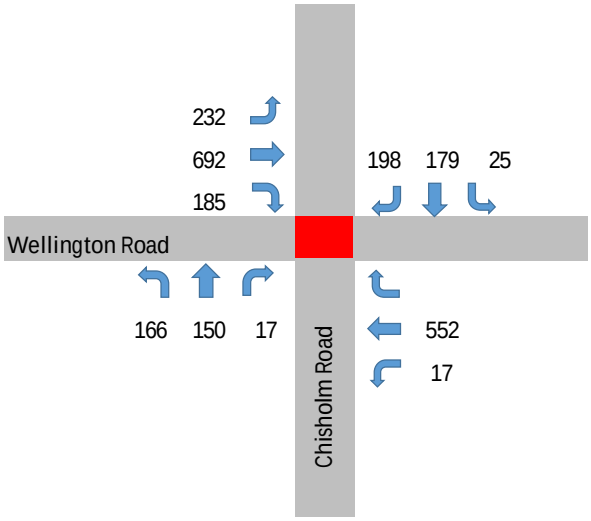


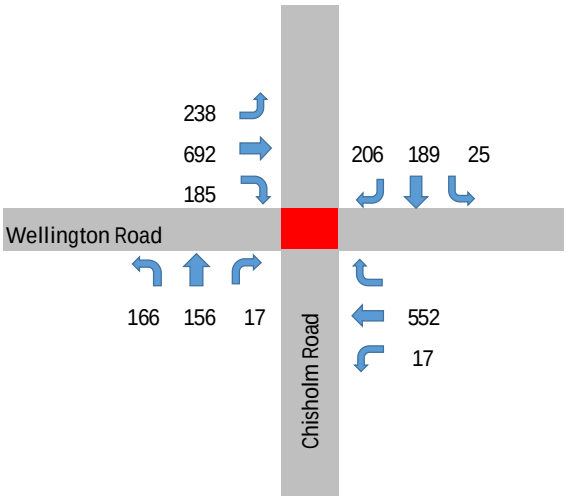
Rawson Street and South Parade Network – Evening Peak Hour





Chisholm Road and Wellington Road – Morning Peak Hour





Chisholm Road and Wellington Road – Evening Peak Hour

4.3.8 Do Minimum with development traffic

The results of the modelling with the development traffic are presented in Table 4.12. This scenario assumes no road upgrades but with the proposed development traffic.

Table 4.12 : Do minimum modelling results

Intersection	Peak	LoS	Average Delay (Seconds)	Degree of Saturation
Rawson Street / South / Parade	Morning	F	74	1.20
	Evening	D	43	0.90
South Parade / Railway Bridge	Morning	A	7	0.50
	Evening	A	10	0.53
South Parade / Alice Street	Morning	F	163	1.30
	Evening	C	39	0.99
Mona Street / Chisholm Road	Morning	C	29	0.85
	Evening	E	61	1.23
Manchester Road / Cumberland Road	Morning	F	118	1.08
	Evening	A	13	0.68
Mona Street / Clyde Street	Morning	D	51	1.08
	Evening	F	82	1.11
Clyde Street / Redfern Street	Morning	F	146	1.133
	Evening	F	211	1.21

Intersection	Peak	LoS	Average Delay (Seconds)	Degree of Saturation
Clyde Street / Hudson Street	Morning	A	6	0.45
	Evening	A	6	0.31
Manchester Road / Chisholm Road	Morning	A	13	0.63
	Evening	A	12	0.60
Chisholm Road / Wellington Road	Morning	D	55	1.01
	Evening	D	51	0.97

The modelling shows that there are a number of capacity constraints within the road network with intersections operating at Level of Service F along Mona Street and South Parade.

4.3.9 Measures to mitigate traffic impacts

The 'do minimum' scenario identified a number of intersections that would have poor operation in the future with the development traffic. A range of measures have been proposed to address these issues. The results of the traffic modelling with the proposed intersection upgrades are shown in Table 4.13. With the proposed intersection upgrades, the intersections would operate at Level of Service 'D' or better. It is noted that Rawson Street / South Parade had a degree of saturation greater than 1 in the morning peak. Even though the average delay gives an overall level of service of D there may be longer delays on some approaches.

Table 4.13 : Mitigation measures modelling results

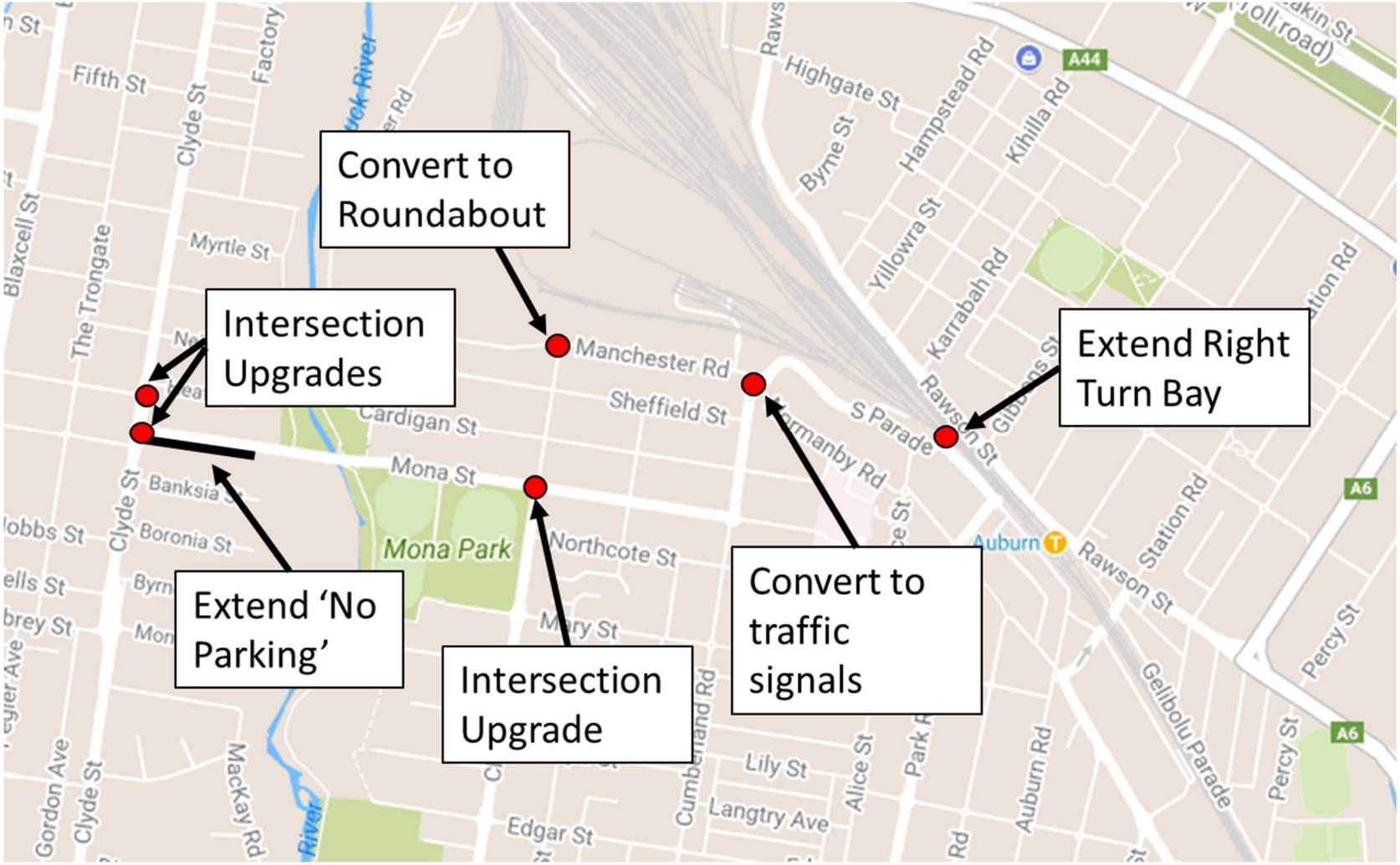
Intersection	Peak	LoS	Average Delay (Sec)	Degree of Saturation
Rawson Street / South / Parade	Morning	D	51	1.05
	Evening	D	50	0.91
South Parade / Railway Bridge	Morning	A	8	0.52
	Evening	A	10	0.53
South Parade / Alice Street	Morning	B	18	0.75
	Evening	A	12	0.75
Mona Street / Chisholm Road	Morning	B	28	0.80
	Evening	C	38	0.83
Manchester Road / Cumberland Road	Morning	C	35	0.90
	Evening	B	26	0.86
Mona Street / Clyde Street	Morning	C	37	0.90
	Evening	D	54	0.99
Clyde Street / Redfern Street	Morning	B	21	0.70
	Evening	C	35	0.90
Clyde Street / Hudson Street	Morning	A	7	0.45
	Evening	A	6	0.33
Manchester Road / Chisholm Road	Morning	A	13	0.63
	Evening	A	12	0.60
Chisholm Road / Wellington Road	Morning	D	55	1.01
	Evening	D	51	0.97

The proposed network upgrades that would be required to mitigate the impacts of the development on the road network are shown in Figure 4.2 and discussed in this section.

The proposed upgrades include:

- Extension of the right turn bay on approach to Rawson Street from South Parade.
- Signalising the roundabout of Manchester Road and Cumberland Road
- Creating a new roundabout at the intersection of Manchester Road and Chisholm Road to provide access to the development.
- Additional right turn bay at Mona Street / Chisholm Road.
- Signalising of Redfern Street / Clyde Street and creating a coordinated staggered T intersection with Mona Street.
- Extending the no parking in Mona Street at Clyde Street to 150m to match the evening peak restrictions and may affect up to 12 car spaces.

Figure 4.2 : Intersection mitigation measures



Extend Right Turn-Bay at South Parade / Rawson Street

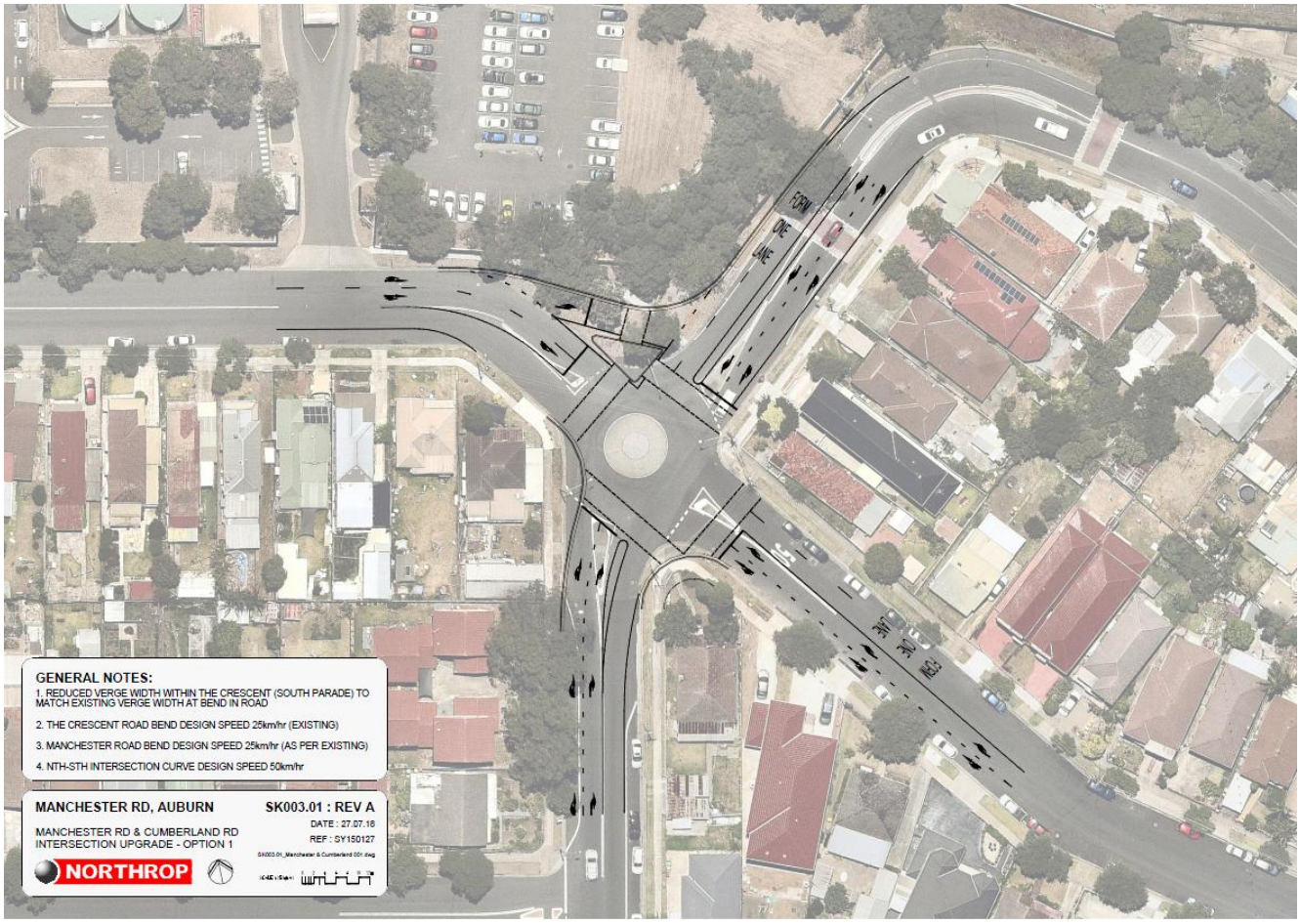
The modelling has identified that due to the long cycle times at Rawson Street / South Parade the intersection would operate at LoS 'F' in the morning peak with the development traffic. To improve the intersection operation, the existing short right turn bay (50m) in South Parade could be extended to 150m to match the existing right turn bay. This would require widening of South Parade. The proponent has purchased land between South Parade and the railway line that could be used for this purpose. The proposed intersection upgrade is shown in Figure 4.3. With the proposed mitigation option the intersections would operate at Level of Service D or better.

Figure 4.3: South parade upgrade

Signalising Cumberland Road / Manchester Road roundabout

The roundabout at Cumberland Road / Manchester Road was found to operate with Level of Service 'F' for the worst movement with the additional development traffic. Therefore, a design to upgrade the intersection to traffic signals has been developed. The proposed design is shown in Figure 4.4. This design would require the acquisition of Sydney Trains land on the northern corner of the intersection.

Figure 4.4: Cumberland Road / Manchester Road proposed intersection layout



As a signalised intersection with the future traffic volumes would operate at Level of Service 'C' and 'B' in the morning and evening peaks respectively.

Upgrade of Mona Street / Clyde Street

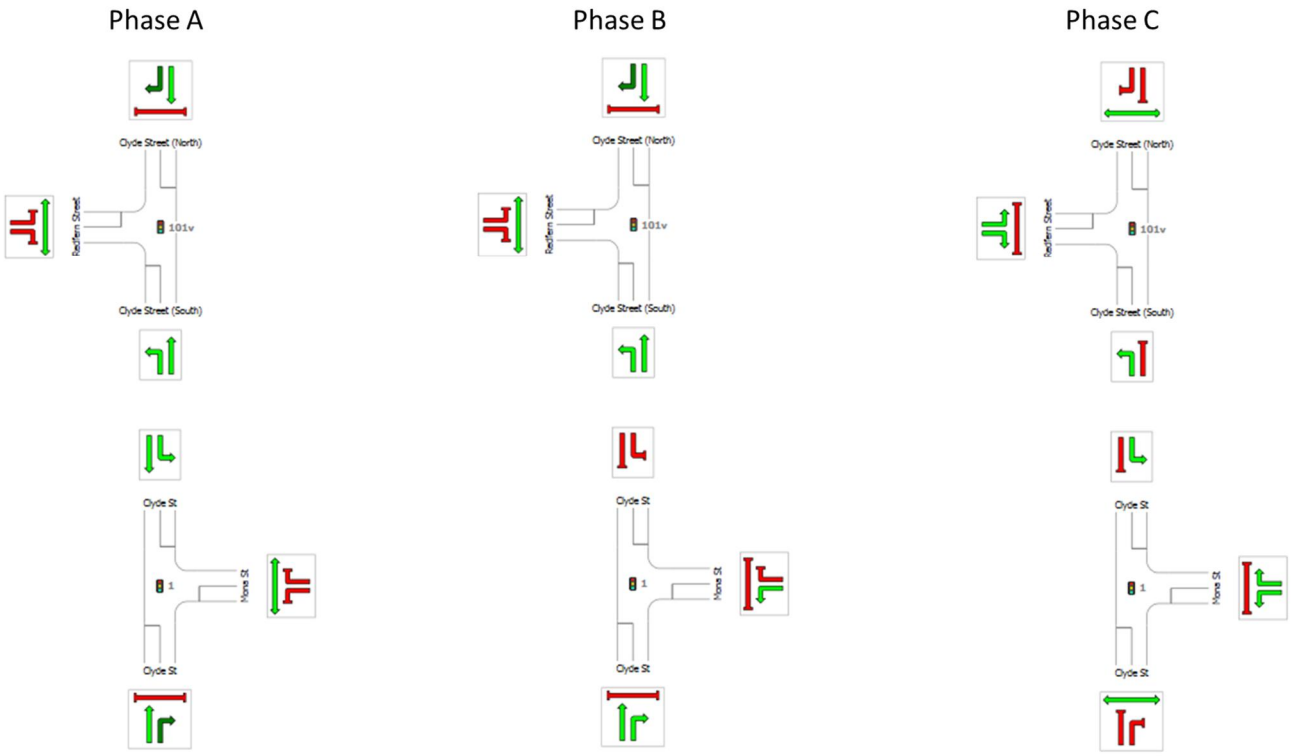
The Mona Street / Clyde Street intersection is constrained by the existing road geometry and the close proximity of Redfern Street roundabout to the signalised intersection. An option has been developed that would involve the signalisation of the Redfern Street / Clyde Street intersection that would allow the two intersections to operate as a single intersection. These works could be undertaken within the existing road reserve and would not require any land acquisition.

The design features dual right turn lanes from Mona Street, extending the no stopping zone to both the morning and evening peaks. The extension of the no stopping zone to the morning peak period would result in the loss of some 10 to 12 on street car spaces which are currently restricted during the evening peak period.

The intersection layout is shown in Figure 4.5 and the signal phasing in Figure 4.6. The proposed signal phasing that was modelled is shown in Figure 4.6.

Figure 4.5: Mona Street / Clyde Street proposed upgrade

Figure 4.6: Mona Street / Clyde Street signal phasing

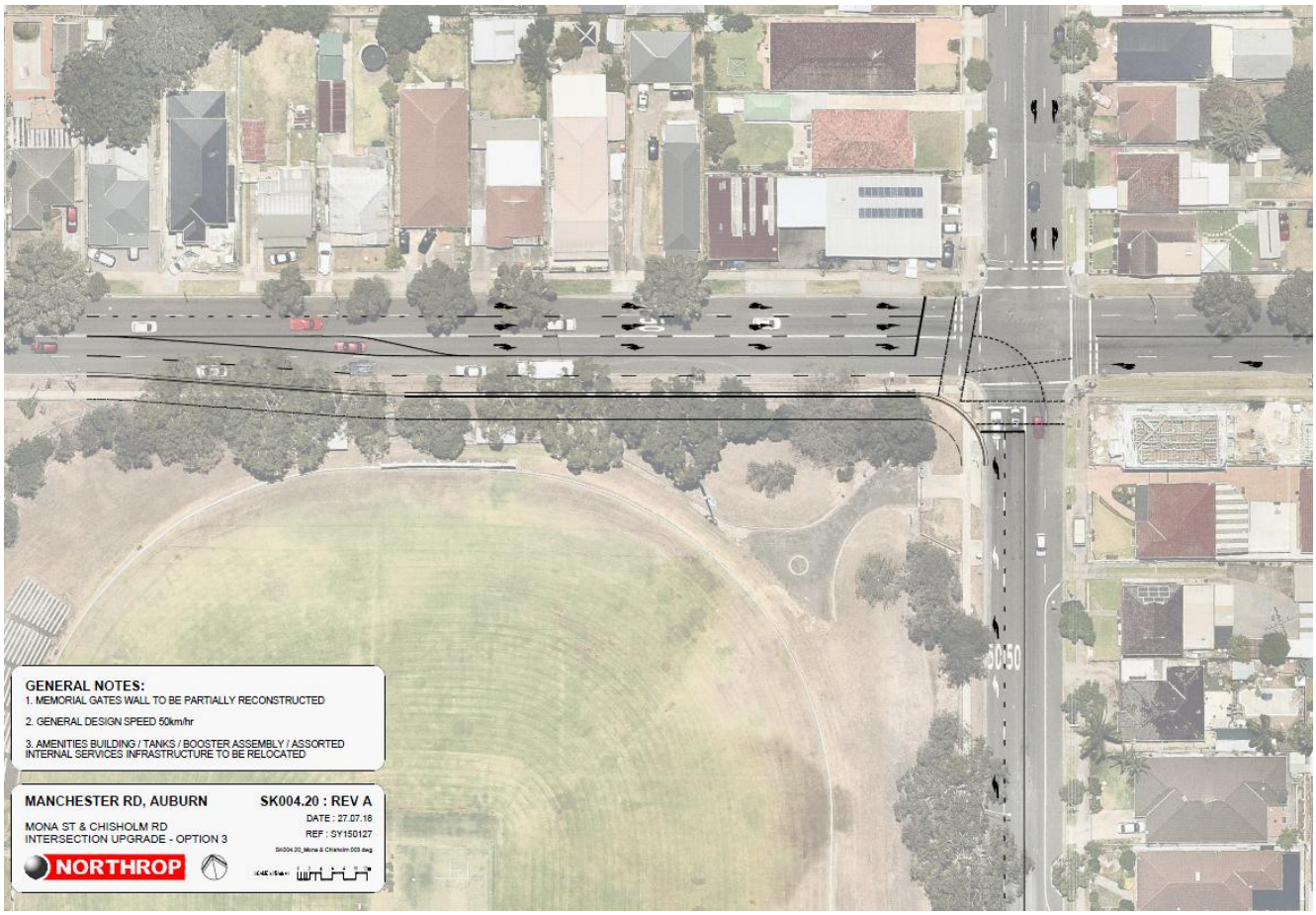


With the proposed upgrade the intersections would improve from existing operation and perform at Level of Service D or better for all intersection in the network.

Upgrade of Mona Street / Chisholm Street

The proposed upgrade has found that a 70m right turn bay is required in Mona Street on the western approach. The layout of the intersection is shown in Figure 4.7. This upgrade would require the acquisition of Council land on the southern side of Mona Street west of Chisolm Road.

Figure 4.7 : Mona Street and Chisholm Road Intersection Upgrade

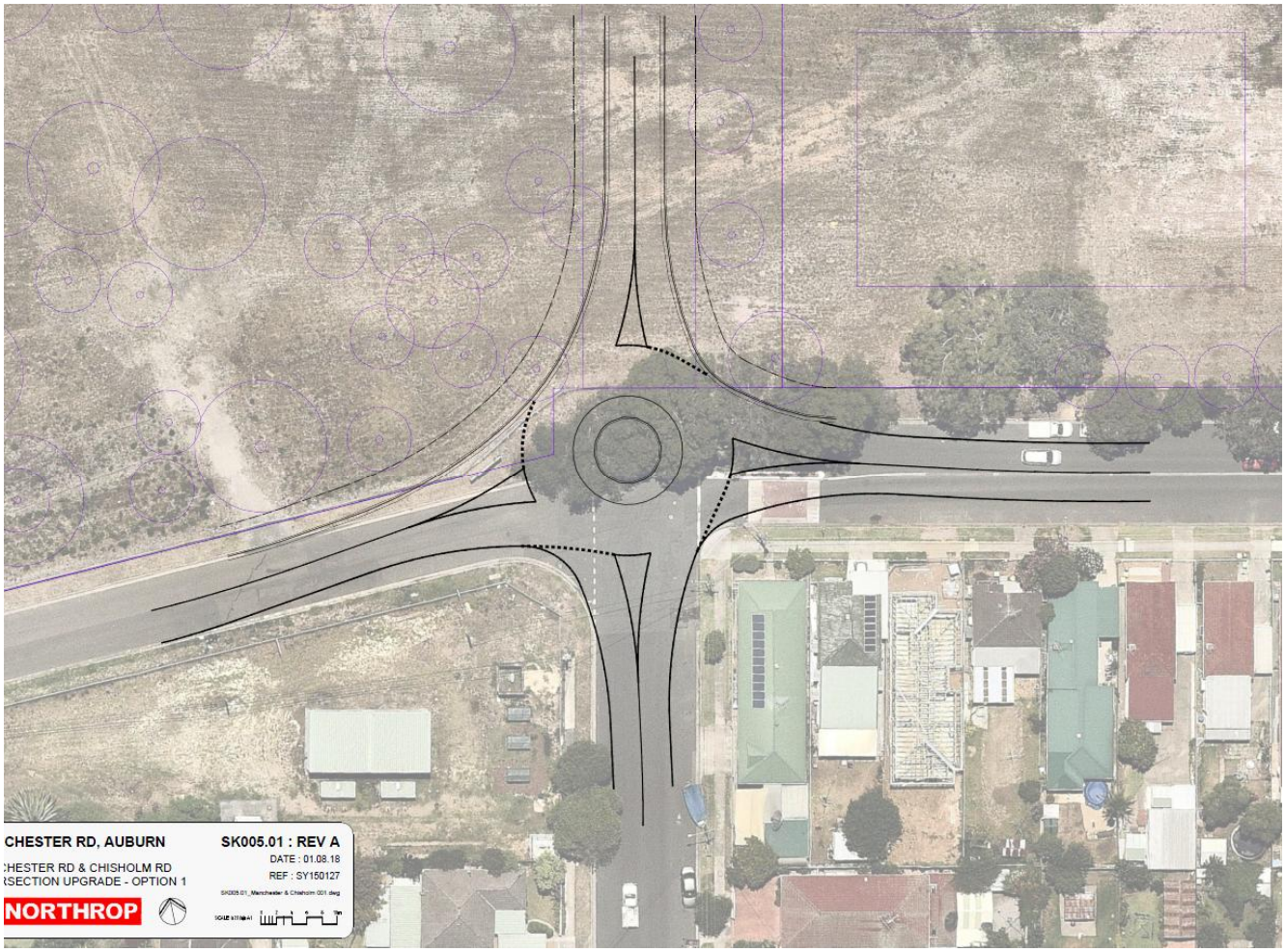


With the proposed intersection upgrade the intersection would operate at Levels of Service C and B in the morning and afternoon peaks respectively.

Access road roundabout

A new roundabout is proposed at the intersection of Manchester Road and Chisholm Street. The roundabout would be designed to accommodate a 12.5m truck to use the circulating road and be mountable to allow for larger articulated vehicles. The intersection layout is shown in Figure 4.8. This access intersection would be constricted within the boundary of the site and would not require any additional land acquisition.

Figure 4.8: Access roundbaout Manchester Road / Chisholm Road



The proposed roundabout would operate at Level of Service A.

4.4 Cumulative impacts

At the time of preparing this submission Sydney Trains have recently completed the Engineering and Maintenance Hub at Clyde. The Hub replaces several old depots with a new building. This Central Hub comprises a five-storey office building and a two-storey amenities building (with a total floor area of 13,400 m^2).

Due to the nature of the development it is assumed that the development would typically generate most traffic in line with trade hours that are typically earlier (6:00am – 7:00am) than the general commuter peak in the morning and earlier (3:00pm – 4:00pm) than the afternoon commuter peak. Further development of this site would be unlikely to generate significant additional traffic during the peak periods of the surrounding road network and has been omitted from this assessment.

4.5 Public transport

The primary focus for public transport will be having access to Clyde and Auburn stations to reduce dependence on private vehicles. The internal road network and pedestrian paths will be provided to link to existing pedestrian paths that access the local stations.

Rail services at Auburn Station come frequently with 3 major service lines connecting to city circle including T1 North Shore Line, T1 Western Line and T2 Inner West & South Line.

There is an opportunity to improve bus services by modifying the existing bus route 908 to service the site along Manchester Road and provide a bus connection to Auburn Station.

It is noted that there will be changes to the rail timetable and the Carlingford Line will which terminates at Clyde Station will close during the construction of the Parramatta Light Rail. However, regular services will remain to support the additional demand from the development and the Engineering and Maintenance Hub but with fewer express services to the Sydney CBD.

4.5.1 Developer initiatives

The developer PAYCE, is willing to explore options of providing a shuttle bus to connect the development and the Auburn Station. The shuttle could be in the form of an electric bus that would be operated free of charge to users. The bus would be an 18 – 22 seater Hino Poncho bus.

Figure 4.9 : Hino Poncho

4.6 Active transport

The site will provide access to the shared paths along the Duck River. The off road path to Clyde Station provides good access to the station. Extension of the shared path along the Duck River to the north as identified in the Auburn Bike Plan would be supported by the development.

4.6.1 Developer initiatives

The developer has indicated they would be willing to provide a bike share scheme to promote cycling and reduce the dependency on cars within the development. This may help to reduce the reliance on private vehicles.

Bicycle parking would also be provided to meet the requirements of the Cumberland Council (Auburn) DCP that requires 1 space for every 5 dwelling units. This would equate to bicycle parking for 230 bicycles and be designed in accordance with the Australian Standard AS2890.6.

5. Conclusion

Jacobs has been commissioned by M Projects on behalf of PAYCE to undertake a traffic and transport impact assessment for the proposed land zoning at Manchester road. The location is currently a mix of 'brown field' and distribution centres and is zoned for industrial land use. The proposed land rezoning is to comprise of mixed use of:

- Retail – 1,000sqm GFA; small shops only
- Community Centre – 1,000sqm GFA
- Commercial Office – 7,500sqm GFA
- Industrial business park – 75,000sqm GFA
- 1,150 dwellings (all units)

5.1 Impacts on the road network

It has been estimated that the site would generate 883 veh/h in the morning peak and 865 veh/h in the evening peak. Of this traffic 390 veh/h and 420 veh/h are generated by the approved industrial land use for the site for the morning and evening peaks respectively.

It has been assumed that 20% of the retail trips would be contained within the site. The traffic distribution has been distributed based on journey to work data for employment and residential trips.

The existing road network is constrained by the operation of intersections and Mona Street / Clyde Street as well as South Parade / Rawson Street. Traffic modelling has identified future capacity issues and significant delays at other intersections as a result of the proposed land use and traffic generated by the site. As a result, a number of intersection upgrades have been proposed to support the development:

- **Mona Street / Clyde Street** with the additional development traffic would operate at Level of Service F in the evening peak period. A proposed intersection upgrade that involved the signalising of the adjacent roundabout at Redfern Street was tested. This resulted in an improved level of service D in the evening peak period. This option requires no land acquisition.
- **Rawson Street / South Parade** with the additional traffic from the development would operate at Level of Service F in the morning peak hour. The proposed intersection upgrade lengthening the existing right turn bays would be accommodated on land already acquired by PAYCE. With this proposed upgrade the intersection would operate at Level of Service D.
- **Manchester Road and Cumberland Road** would operate at level of service F for the worst performing turning movement in the morning peak hour. It is proposed to convert this roundabout to a signalised intersection. With the proposed upgrade the intersection would perform at level of service C in the morning peak period and level of service B in the evening peak period.
- **Mona Street and Chisholm Road** would operate at level of service E in the evening peak hour with the additional development traffic. The proposal to upgrade the intersection with an additional right turn has been modelled. With the additional right turn the intersection would operate at level of service B in the morning peak hour and C in the evening peak hour.
- **Site access** road to the residential portion of the proposed development is proposed to be from a new roundabout at the intersection of Chisholm Road and Manchester Road. The proposed intersection would operate at level of service A.

Civil design of each of the proposed intersection upgrades undertaken by Northrop and provided in this report show that the proposed designs are feasible and would require no acquisition of private land, being accommodated within the existing road reserve, on land owned by PAYCE or on Council Land.

The proposed intersection upgrades would also provide a benefit to the existing road users by providing additional capacity to the surrounding road network at existing points of constraint and reducing delays at the intersection of Mona Street and Clyde Street.

5.2 Public transport

The site is considered to be a walkable distance to Clyde Station and Auburn Station requiring approximately 15 minutes to walk to Clyde station and 15 minutes to Auburn station. The primary focus for public transport will be access to the stations and Clyde and Auburn to reduce dependence on private vehicles. The internal road network and pedestrian paths will be provided to link to existing pedestrian paths that access the local stations.

There is an opportunity to improve bus services by modifying the existing bus route 908 to service the site along Manchester Road and provide a bus connection to Auburn Station.

It is noted that there will be changes to the rail timetable and the Carlingford Line will which terminates at Clyde will close during the construction of the Parramatta Light Rail. However, regular services will remain to support the additional demand from the development but with fewer express services to the Sydney CBD.

5.3 Active transport

The site will provide access to the shared paths along the Duck River. The off road path to Clyde Station that has recently been upgraded as part of the works for the Engineering and Maintenance Hub provides good access to the station. Extension of the shared path along the Duck River to the north as identified in the Auburn Bike Plan would be supported by the development.

5.4 Conclusion

Jacobs has undertaken an assessment of traffic and transport for the proposed redevelopment of 300 Manchester Road and rezoning of land use. The key findings of the study were:

- The site is within 30 minutes by public transport and walking of major employment centers in Parramatta, Granville and Auburn.
- A range of intersection upgrades have been proposed that would fully mitigate the impacts of traffic generated by the rezoning proposal to acceptable levels of service and improve capacity on intersections for all road users.
- Civil designs of intersection upgrades have been undertaken and demonstrate that the proposed measures are feasible with no additional land acquisition from private land holders.
- The site is considered to be within a walkable distance from train stations at Clyde and at Auburn that have regular services to Liverpool, Parramatta and the Sydney CBD.
- The site has potential for connections to existing walking and cycling routes along the Duck River.

References

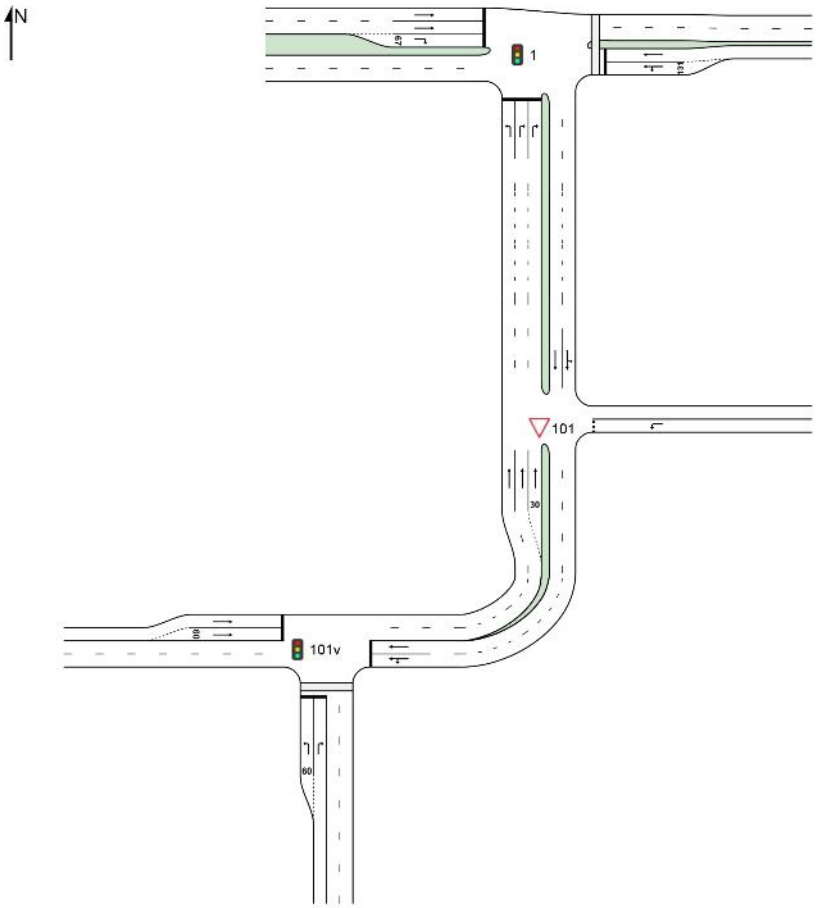
- Guide to Road Design, Park 4A: Unsignalised and Signalised Intersections, Austroads, August 2009
- RTA Guide to Traffic Generating Developments – RTA version 2.2 October 2002
- Austroads Guide to Traffic Management Part 12: Traffic Impacts of Developments – Austroads, August 2009

Appendix A. Sidra Model Outputs

NETWORK LAYOUT

Network: N101 [AM Base Network]

New Network



SITES IN NETWORK	
Site ID	**Site Name**
1	AM Base Rawson South Parade
101	AM Base S Parade
101v	AM Base S Parade Alice

LANE SUMMARY

Site: 101 [AM Base S Parade]

Network: N101 [AM Base Network]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: S Parade															
Lane 1	424	2.0	424	2.0	962	0.440	100	0.0	LOS A	15.1 N5	107.8 N5	Full	45	-50.0 N3	46.0 N5
Lane 2	424	2.0	424	2.0	962	0.440	100	0.0	LOS A	13.7 N5	97.8 N5	Full	45	-50.0 N3	37.8 N5
Lane 3	424	2.0	424	2.0	962	0.440	100	0.0	LOS A	13.7 N5	97.8 N5	Short	30	-50.0 N3	NA
Approach	1271	2.0	1271	2.0		0.440		0.0	NA	15.1	107.8				
East: S Parade															
Lane 1	77	2.0	77	2.0	755	0.102	100	6.3	LOS A	0.3	2.2	Full	500	-34.1 N3	0.0
Approach	77	2.0	77	2.0		0.102		6.3	LOS A	0.3	2.2				
North: Railway Bridge															
Lane 1	463	2.0	463	2.0	1560	0.297	100	2.2	LOS A	0.0	0.0	Full	40	-16.3 N3	0.0
Lane 2	359	2.0	359	2.0	1207	0.297	100	0.0	LOS A	0.0	0.0	Full	40	-37.3 N3	0.0
Approach	822	2.0	822	2.0		0.297		1.2	NA	0.0	0.0				
Intersection	2169	2.0	2169	2.0		0.440		0.7	NA	15.1	107.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.

LANE SUMMARY

Site: 1 [AM Base Rawson South Parade]

Network: N101 [AM Base Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Cycle Time - User-Given)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Railway Bridge															
Lane 1	597	2.0	597	2.0	1144	0.522	100	16.7	LOS B	9.2 N 4	65.3 N4	Full	40	0.0	50.0
Lane 2	337	2.0	337	2.0	473	0.712	100	47.8	LOS D	9.2 N 4	65.3 N4	Full	40	0.0	50.0
Lane 3	337	2.0	337	2.0	473	0.712	100	47.8	LOS D	9.2 N 4	65.3 N4	Full	40	0.0	50.0
Approach	1271	2.0	1271	2.0		0.712		33.2	LOS C	9.2	65.3				
East: Rawson Street															
Lane 1	352	2.0	352	2.0	504	0.699	100	46.9	LOS D	18.3	130.4	Short	131	0.0	NA
Lane 2	370	2.0	370	2.0	529	0.699	100	42.2	LOS C	19.5	138.9	Full	500	0.0	0.0
Approach	722	2.0	722	2.0		0.699		44.5	LOS D	19.5	138.9				
West: Rawson Street															
Lane 1	109	2.0	109	2.0	1235	0.088	100	8.5	LOS A	2.4	16.8	Full	500	0.0	0.0
Lane 2	109	2.0	109	2.0	1235	0.088	100	8.5	LOS A	2.4	16.8	Full	500	0.0	0.0
Lane 3	481	2.0	481	2.0	531[1]	0.906	100	62.7	LOS E	31.8	226.1	Short	67	0.0	NA
Approach	699	2.0	699	2.0		0.906		45.8	LOS D	31.8	226.1				
Intersection	2692	2.0	2692	2.0		0.906		39.5	LOS C	31.8	226.1				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
N4 Average back of queue has been restricted to the available queue storage space.

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LANE SUMMARY

Site: 101v [AM Base S Parade Alice]

Network: N101 [AM Base Network]

New Site
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Alice Street															
Lane 1	8	2.0	8	2.0	671	0.013	100	18.5	LOS B	0.2	1.1	Short	60	0.0	NA
Lane 2	376	2.0	376	2.0	418	0.900	100	43.4	LOS D	15.2	108.2	Full	500	-37.8 N3	0.0
Approach	384	2.0	384	2.0		0.900		42.8	LOS D	15.2	108.2				
East: S Parade															
Lane 1	300	2.0	300	2.0	804	0.373	100	15.2	LOS B	6.0	42.8	Full	45	0.0	0.5
Lane 2	311	2.0	311	2.0	834	0.373	100	12.5	LOS A	6.2	44.3	Full	45	0.0	3.6
Approach	611	2.0	611	2.0		0.373		13.8	LOS A	6.2	44.3				
West: S Parade															
Lane 1	416	2.0	416	2.0	451	0.923	100	42.9	LOS D	18.5	131.6	Full	500	-46.0 N3	0.0
Lane 2	479	2.0	479	2.0	519	0.923	100	41.0	LOS C	20.8	148.1	Short	60	-37.8 N3	NA
Approach	895	2.0	895	2.0		0.923		41.9	LOS C	20.8	148.1				
Intersection	1889	2.0	1889	2.0		0.923		33.0	LOS C	20.8	148.1				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.

LANE SUMMARY

Site: 1 [PM Base Rawson South Parade]

Network: N101 [PM Base Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Cycle Time - User-Given)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Railway Bridge															
Lane 1	309	2.0	309	2.0	1389	0.223	100	7.9	LOS A	5.1	36.6	Full	40	0.0	0.0
Lane 2	228	2.0	228	2.0	763	0.299	100	28.3	LOS B	8.8	62.8	Full	40	0.0	46.3
Lane 3	228	2.0	228	2.0	763	0.299	100	28.3	LOS B	8.8	62.8	Full	40	0.0	46.3
Approach	766	2.0	766	2.0		0.299		20.1	LOS B	8.8	62.8				
East: Rawson Street															
Lane 1	655	2.0	655	2.0	1114	0.588	100	78.9	LOS F	39.9	283.8	Short	131	0.0	NA
Lane 2	160	2.0	160	2.0	273	0.588	100	53.2	LOS D	9.0	64.2	Full	500	0.0	0.0
Approach	816	2.0	816	2.0		0.588		73.9	LOS F	39.9	283.8				
West: Rawson Street															
Lane 1	455	2.0	455	2.0	930	0.489	53[5]	22.3	LOS B	17.8	126.6	Full	500	0.0	0.0
Lane 2	389	2.0	389	2.0	422[1]	0.921	100	68.5	LOS E	26.2	186.6	Full	500	0.0	0.0
Lane 3	366	2.0	366	2.0	397[1]	0.921	100	70.3	LOS E	25.3	179.9	Short	67	-11.3[N3]	NA
Approach	1209	2.0	1209	2.0		0.921		51.7	LOS D	26.2	186.6				
Intersection	2792	2.0	2792	2.0		0.921		49.5	LOS D	39.9	283.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

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LANE SUMMARY

Site: 101 [PM Base S Parade]

Network: N101 [PM Base Network]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: S Parade															
Lane 1	370	2.0	370	2.0	1925	0.192	100	0.0	LOS A	0.0	0.0	Full	45	0.0	0.0
Lane 2	198	2.0	198	2.0	1033	0.192	100	0.0	LOS A	0.0	0.0	Full	45	-46.3 N3	0.0
Lane 3	198	2.0	198	2.0	1033	0.192	100	0.0	LOS A	0.0	0.0	Short	30	-46.3 N3	NA
Approach	766	2.0	766	2.0		0.192		0.0	NA	0.0	0.0				
East: S Parade															
Lane 1	77	2.0	77	2.0	801	0.096	100	8.5	LOS A	0.4	3.0	Full	500	0.0	0.0
Approach	77	2.0	77	2.0		0.096		8.5	LOS A	0.4	3.0				
North: Railway Bridge															
Lane 1	850	2.0	850	2.0	1890	0.450	100	1.3	LOS A	0.0	0.0	Full	40	0.0	0.0
Lane 2	433	2.0	433	2.0	962	0.450	100	0.0	LOS A	6.9 N5	49.0 N5	Full	40	-50.0 N3	11.3 N5
Approach	1283	2.0	1283	2.0		0.450		0.8	NA	6.9	49.0				
Intersection	2126	2.0	2126	2.0		0.450		0.8	NA	6.9	49.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.

LANE SUMMARY

Site: 101v [PM Base S Parade Alice]

Network: N101 [PM Base Network]

New Site
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Alice Street															
Lane 1	3	2.0	3	2.0	519	0.006	100	22.1	LOS B	0.1	0.5	Short	60	0.0	NA
Lane 2	356	2.0	356	2.0	519	0.686	100	27.7	LOS B	9.9	70.3	Full	500	0.0	0.0
Approach	359	2.0	359	2.0		0.686		27.7	LOS B	9.9	70.3				
East: S Parade															
Lane 1	305	2.0	305	2.0	946	0.323	48[5]	12.8	LOS A	5.2	37.2	Full	45	0.0	0.0
Lane 2	674	2.0	674	2.0	995	0.677	100	11.7	LOS A	10.3[N4]	73.4[N4]	Full	45	0.0	50.0
Approach	979	2.0	979	2.0		0.677		12.1	LOS A	10.3	73.4				
West: S Parade															
Lane 1	205	2.0	205	2.0	995	0.206	100	8.5	LOS A	3.3	23.2	Full	500	0.0	0.0
Lane 2	205	2.0	205	2.0	995	0.206	100	8.5	LOS A	3.3	23.2	Short	60	0.0	NA
Approach	411	2.0	411	2.0		0.206		8.5	LOS A	3.3	23.2				
Intersection	1748	2.0	1748	2.0		0.686		14.4	LOS A	10.3	73.4				

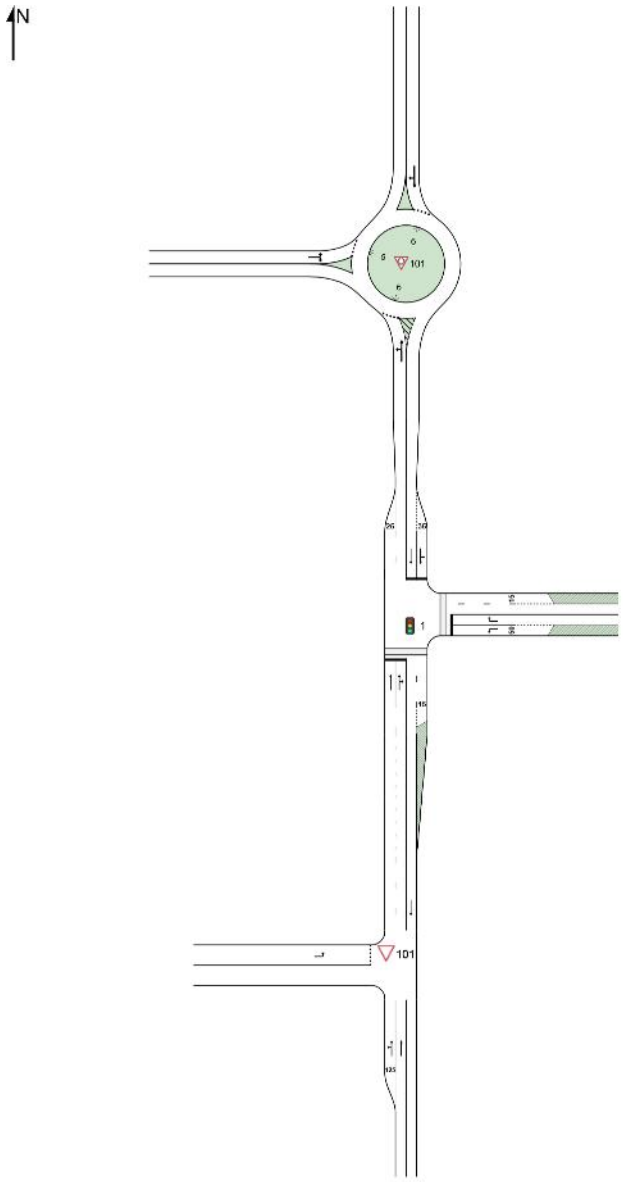
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
N4 Average back of queue has been restricted to the available queue storage space.

NETWORK LAYOUT

Network: N101 [2017 AM Base]

New Network



SITES IN NETWORK	
Site ID	**Site Name**
1	Mona Street / Clyde Street 2017AM
101	Clyde Redfern 2017 AM
101	Clyde Hudson 2017 AM

LANE SUMMARY

Site: 101 [Clyde Hudson 2017 AM]

Network: N101 [2017 AM Base]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde Street															
Lane 1	443	2.0	443	2.0	981	0.452	100	0.4	LOS A	11.0 N5	78.6 N5	Short	125	-48.9 N3	NA
Lane 2	435	2.0	435	2.0	962	0.452	100	0.1	LOS A	23.9 N5	170.2 N5	Full	500	-50.0 N3	0.0
Approach	878	2.0	878	2.0		0.452		0.3	NA	23.9	170.2				
North: Clyde Street															
Lane 1	423	2.0	423	2.0	1925	0.220	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	423	2.0	423	2.0		0.220		0.0	NA	0.0	0.0				
West: Hudson Street															
Lane 1	127	2.0	127	2.0	538	0.237	100	7.3	LOS A	0.5	3.4	Full	500	-50.0 N3	0.0
Approach	127	2.0	127	2.0		0.237		7.3	LOS A	0.5	3.4				
Intersection	1428	2.0	1428	2.0		0.452		0.8	NA	23.9	170.2				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.

LANE SUMMARY

Site: 101 [Clyde Redfern 2017 AM]

Network: N101 [2017 AM Base]

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Clyde Street (South)															
Lane 1[d]	924	2.0	924	2.0	1869	0.494	100	3.4	LOS A	4.7	33.2	Full	50	0.0	0.0
Approach	924	2.0	924	2.0		0.494		3.4	LOS A	4.7	33.2				
North: Clyde Street (North)															
Lane 1[d]	557	2.0	557	2.0	600	0.929	100	21.8	LOS B	10.1	71.6	Full	500	-49.1[N3]	0.0
Approach	557	2.0	557	2.0		0.929		21.8	LOS B	10.1	71.6				
West: Redfern Street															
Lane 1[d]	371	2.0	371	2.0	547	0.677	100	14.4	LOS A	4.6	32.8	Full	500	-49.1[N3]	0.0
Approach	371	2.0	371	2.0		0.677		14.4	LOS A	4.6	32.8				
Intersection	1852	2.0	1852	2.0		0.929		11.1	LOS A	10.1	71.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

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LANE SUMMARY

Site: 1 [Mona Street / Clyde Street 2017AM]

Network: N101 [2017 AM Base]

Clyde St / Mona St
Signals - Fixed Time Isolated Cycle Time = 100 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde St															
Lane 1	456	2.0	456	2.0	1020	0.447	56[5]	15.4	LOS B	4.1 N4	29.4 N4	Full	18	0.0	50.0
Lane 2	531	2.0	531	2.0	671	0.791	100	37.1	LOS C	4.1 N4	29.4 N4	Full	18	0.0	50.0
Approach	986	2.0	986	2.0		0.791		27.1	LOS B	4.1	29.4				
East: Mona St															
Lane 1	265	2.0	265	2.0	1318	0.201	100	9.4	LOS A	4.2	29.6	Short (P)	50	0.0	NA
Lane 2	468	2.0	468	2.0	501[1]	0.936	100	61.3	LOS E	28.0	199.2	Full	500	0.0	0.0
Approach	734	2.0	734	2.0		0.936		42.5	LOS D	28.0	199.2				
North: Clyde St															
Lane 1	737	2.0	737	2.0	897[1]	0.822	100	24.3	LOS B	11.5 N4	81.6 N4	Short	35	0.0	NA
Lane 2	158	2.0	158	2.0	308	0.513	62[5]	42.5	LOS D	7.2	51.6	Full	50	0.0	50.0[8]
Approach	895	2.0	895	2.0		0.822		27.5	LOS B	11.5	81.6				
Intersection	2615	2.0	2615	2.0		0.936		31.6	LOS C	28.0	199.2				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
8 Probability of Blockage has been set on the basis of a queue that overflows from an adjacent short lane.
N4 Average back of queue has been restricted to the available queue storage space.

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LANE SUMMARY

Site: 101 [Clyde Hudson - 2017 PM]

Network: N101 [2017 PM Base]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde Street															
Lane 1	309	2.0	309	2.0	1014	0.305	100	0.7	LOS A	13.8 N5	98.2 N5	Short	125	-47.0 N3	NA
Lane 2	293	2.0	293	2.0	962	0.305	100	0.1	LOS A	5.3 N5	37.9 N5	Full	500	-50.0 N3	0.0
Approach	602	2.0	602	2.0		0.305		0.4	NA	13.8	98.2				
North: Clyde Street															
Lane 1	637	2.0	637	2.0	1925	0.331	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	637	2.0	637	2.0		0.331		0.0	NA	0.0	0.0				
West: Hudson Street															
Lane 1	12	2.0	12	2.0	631	0.018	100	6.4	LOS A	0.0	0.3	Full	500	-50.0 N3	0.0
Approach	12	2.0	12	2.0		0.018		6.4	LOS A	0.0	0.3				
Intersection	1251	2.0	1251	2.0		0.331		0.2	NA	13.8	98.2				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.

LANE SUMMARY

Site: 3 [Clyde Hudson Do Minimum PM]

Network: N101 [2017 PM Do Minimum]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde Street															
Lane 1	309	2.0	309	2.0	1014	0.305	100	0.7	LOS A	19.0 N5	135.4 N5	Short	125	-47.0 N3	NA
Lane 2	293	2.0	293	2.0	962	0.305	100	0.1	LOS A	8.2 N5	58.5 N5	Full	500	-50.0 N3	0.0
Approach	602	2.0	602	2.0		0.305		0.4	NA	19.0	135.4				
North: Clyde Street															
Lane 1	637	2.0	603	2.0	1925	0.313	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	637	2.0	603 N1	2.0		0.313		0.0	NA	0.0	0.0				
West: Hudson Street															
Lane 1	12	2.0	12	2.0	631	0.018	100	6.4	LOS A	0.0	0.3	Full	500	-50.0 N3	0.0
Approach	12	2.0	12	2.0		0.018		6.4	LOS A	0.0	0.3				
Intersection	1251	2.0	1217 N1	2.1		0.313		0.3	NA	19.0	135.4				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.

LANE SUMMARY

Site: 101 [Clyde Redfern 2017 PM]

Network: N101 [2017 PM Base]

New Site
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Clyde Street (South)															
Lane 1[d]	1122	2.0	1122	2.0	1867	0.601	100	3.4	LOS A	7.8	55.5	Full	50	0.0	8.1
Approach	1122	2.0	1122	2.0		0.601		3.4	LOS A	7.8	55.5				
North: Clyde Street (North)															
Lane 1[d]	655	2.0	655	2.0	627	1.045	100	73.8	LOS F	37.7	268.6	Full	500	-49.1[N3]	0.0
Approach	655	2.0	655	2.0		1.045		73.8	LOS F	37.7	268.6				
West: Redfern Street															
Lane 1[d]	328	2.0	328	2.0	503	0.653	100	17.8	LOS B	5.8	41.5	Full	500	-49.0[N3]	0.0
Approach	328	2.0	328	2.0		0.653		17.8	LOS B	5.8	41.5				
Intersection	2105	2.0	2105	2.0		1.045		27.5	LOS B	37.7	268.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

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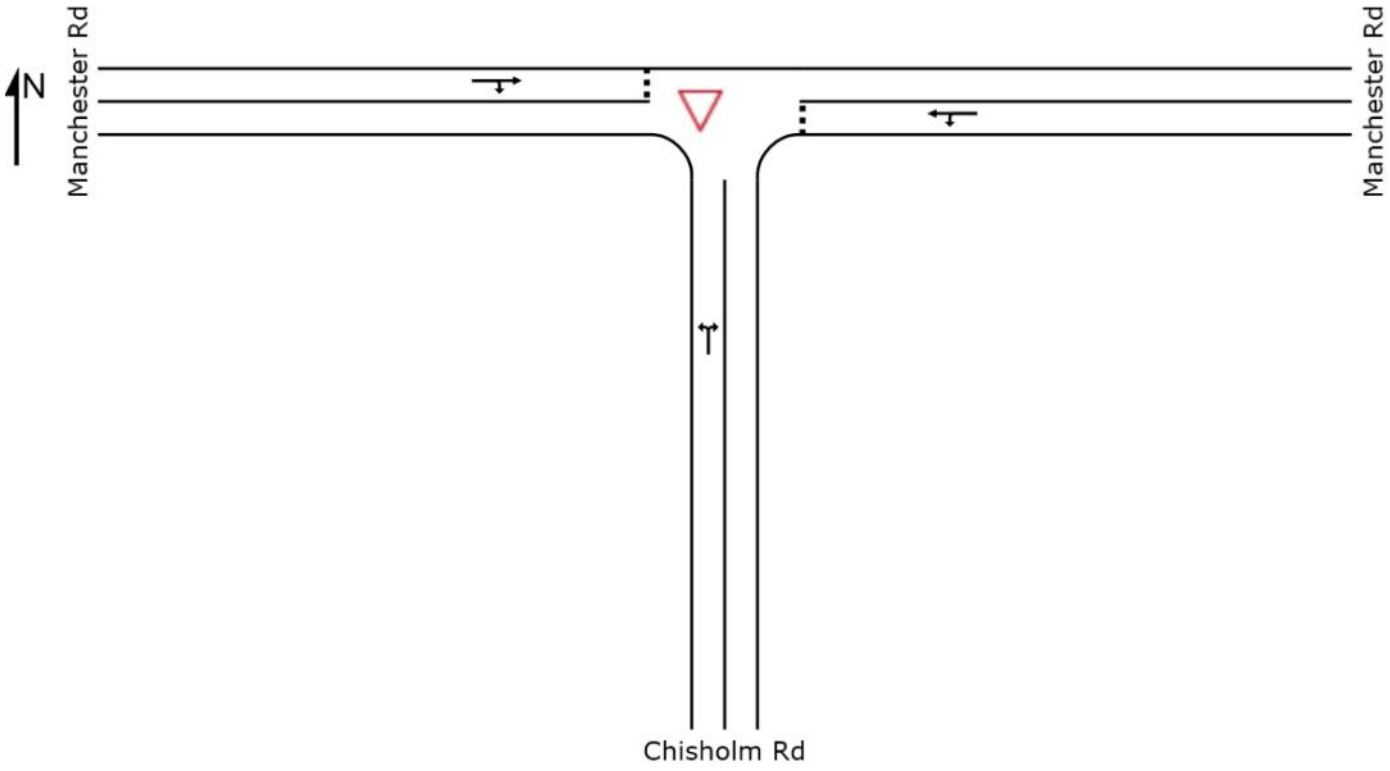
SITE LAYOUT

Site: Manchester Rd / Chisholm Rd AM

Manchester Rd / Chisholm Rd
Giveway / Yield (Two-Way)



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LANE SUMMARY

Site: Manchester Rd / Chisholm Rd AM

Manchester Rd / Chisholm Rd
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chisholm Rd													
Lane 1	395	2.0	1831	0.216	100	4.6	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	395	2.0		0.216		4.6	NA	0.0	0.0				
East: Manchester Rd													
Lane 1	109	2.0	1501	0.073	100	5.7	LOS A	0.4	2.7	Full	500	0.0	0.0
Approach	109	2.0		0.073		5.7	LOS A	0.4	2.7				
West: Manchester Rd													
Lane 1	37	2.0	908	0.041	100	3.1	LOS A	0.1	1.0	Full	500	0.0	0.0
Approach	37	2.0		0.041		3.1	LOS A	0.1	1.0				
Intersection	541	2.0		0.216		4.7	NA	0.4	2.7				

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

Lane LOS values are based on average delay per lane.

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

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 lanes.

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.

LANE SUMMARY

Site: Manchester Rd / Chisholm Rd PM

Manchester Rd / Chisholm Rd
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chisholm Rd													
Lane 1	214	2.0	1831	0.117	100	4.6	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	214	2.0		0.117		4.6	NA	0.0	0.0				
East: Manchester Rd													
Lane 1	178	2.0	1773	0.100	100	5.3	LOS A	0.5	3.9	Full	500	0.0	0.0
Approach	178	2.0		0.100		5.3	LOS A	0.5	3.9				
West: Manchester Rd													
Lane 1	56	2.0	1061	0.053	100	2.4	LOS A	0.2	1.3	Full	500	0.0	0.0
Approach	56	2.0		0.053		2.4	LOS A	0.2	1.3				
Intersection	447	2.0		0.117		4.6	NA	0.5	3.9				

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

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

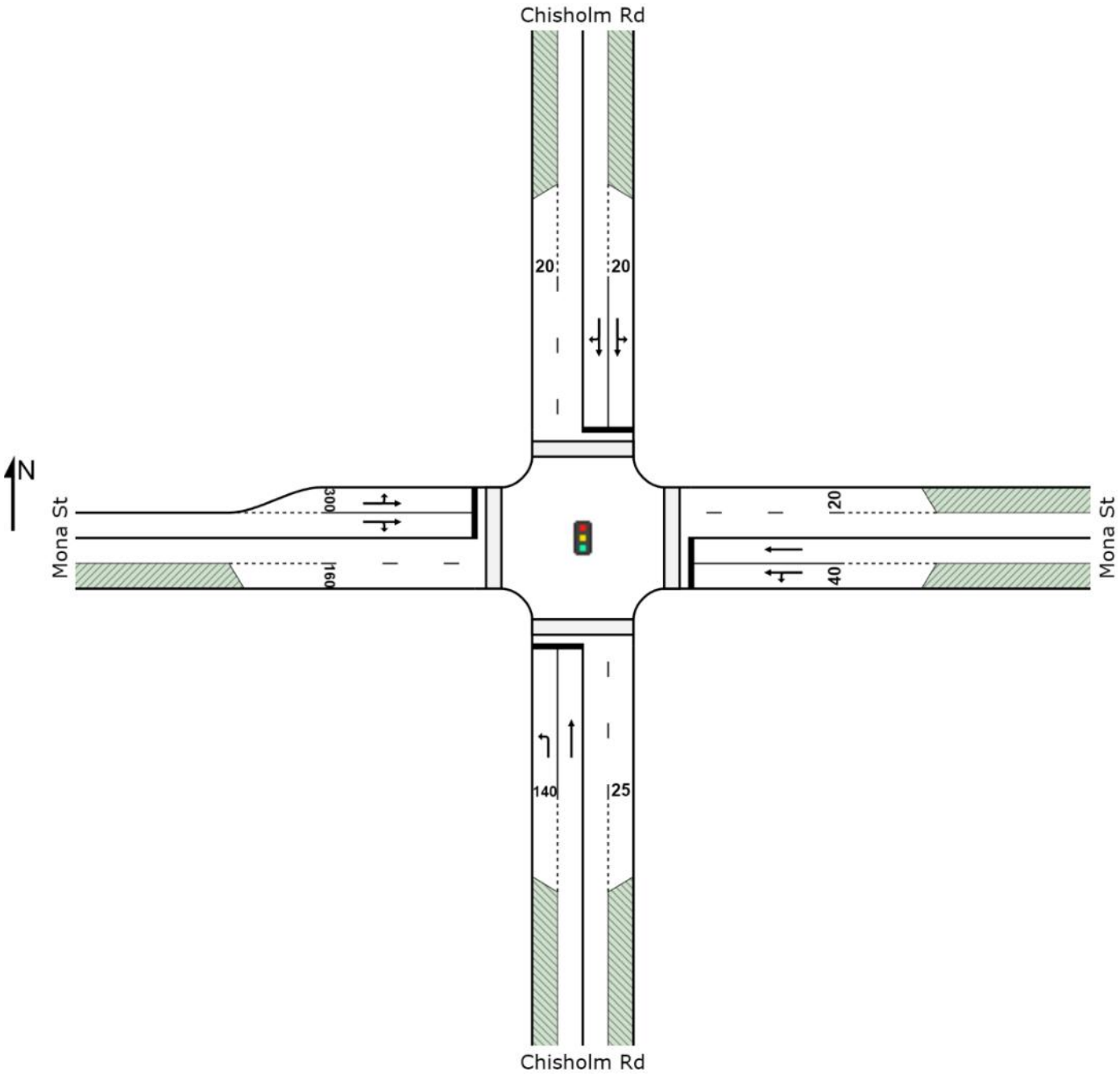
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

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

SITE LAYOUT

Site: Mona Street / Chrisholm Road 2017AM

Mona Street / Chrisholm Road
Signals - Fixed Time Isolated



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Project: \\Jacobs.com\ANZ\IE\Projects\04_Eastern\IA162400\06 Technical\Sidra Modelling\Base Model\Intersections (BASE) v2.sip6

LANE SUMMARY

Site: Mona Street / Chrisholm Road 2017AM

Mona Street / Chrisholm Road
Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chisholm Rd													
Lane 1	423	2.8	941	0.450	100	24.0	LOS B	15.4	110.3	Short (P)	140	0.0	NA
Lane 2	98	2.8	559	0.175	100	33.9	LOS C	4.2	30.5	Full	500	0.0	0.0
Approach	521	2.8		0.450		25.8	LOS B	15.4	110.3				
East: Mona St													
Lane 1	69	2.8	730	0.095	20[7]	25.6	LOS B	2.6	18.3	Short (P)	40	0.0	NA
Lane 2	326	2.8	687[1]	0.475	100	29.4	LOS C	14.1	101.0	Full	500	0.0	0.0
Approach	396	2.8		0.475		28.7	LOS C	14.1	101.0				
North: Chisholm Rd													
Lane 1	38	2.8	558	0.068	23[6]	32.8	LOS C	1.6	11.4	Short (P)	20	0.0	NA
Lane 2	79	2.8	267	0.295	100	42.4	LOS C	3.8	27.0	Full	500	0.0	0.0
Approach	117	2.8		0.295		39.3	LOS C	3.8	27.0				
West: Mona St													
Lane 1	804	2.8	1142	0.703	43[6]	18.8	LOS B	31.7	227.3	Short	300	0.0	NA
Lane 2	602	2.8	739	0.815	50[7]	35.1	LOS C	29.7	212.9	Full	500	0.0	0.0
Approach	1405	2.8		0.815		25.8	LOS B	31.7	227.3				
Intersection	2439	2.8		0.815		26.9	LOS B	31.7	227.3				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
6 Lane under-utilisation due to downstream effects
7 Lane under-utilisation specified by the user

LANE SUMMARY

Site: Mona Street / Chrisholm Road 2017PM

Mona Street / Chrisholm Road
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chisholm Rd													
Lane 1	519	2.8	896	0.579	100	29.5	LOS C	23.1	165.3	Short (P)	140	0.0	NA
Lane 2	114	2.8	457	0.249	100	43.1	LOS D	5.8	41.8	Full	500	0.0	0.0
Approach	633	2.8		0.579		31.9	LOS C	23.1	165.3				
East: Mona St													
Lane 1	318	2.8	558[1]	0.570	87[6]	28.5	LOS B	14.0	100.1	Short (P)	40	0.0	NA
Lane 2	369	2.8	563[1]	0.656	100	29.3	LOS C	16.8	120.1	Full	500	0.0	0.0
Approach	687	2.8		0.656		28.9	LOS C	16.8	120.1				
North: Chisholm Rd													
Lane 1	72	2.8	456	0.157	20[5]	42.1	LOS C	3.6	25.6	Short (P)	20	0.0	NA
Lane 2	124	2.8	156[1]	0.795	100	68.0	LOS E	8.5	60.8	Full	500	0.0	0.0
Approach	196	2.8		0.795		58.6	LOS E	8.5	60.8				
West: Mona St													
Lane 1	431	2.8	1259	0.342	43[6]	11.3	LOS A	11.4	82.0	Short	60	0.0	NA
Lane 2	261	2.8	659	0.396	50[7]	24.8	LOS B	11.0	78.7	Full	500	0.0	0.0
Approach	692	2.8		0.396		16.4	LOS B	11.4	82.0				
Intersection	2207	2.8		0.795		28.5	LOS B	23.1	165.3				

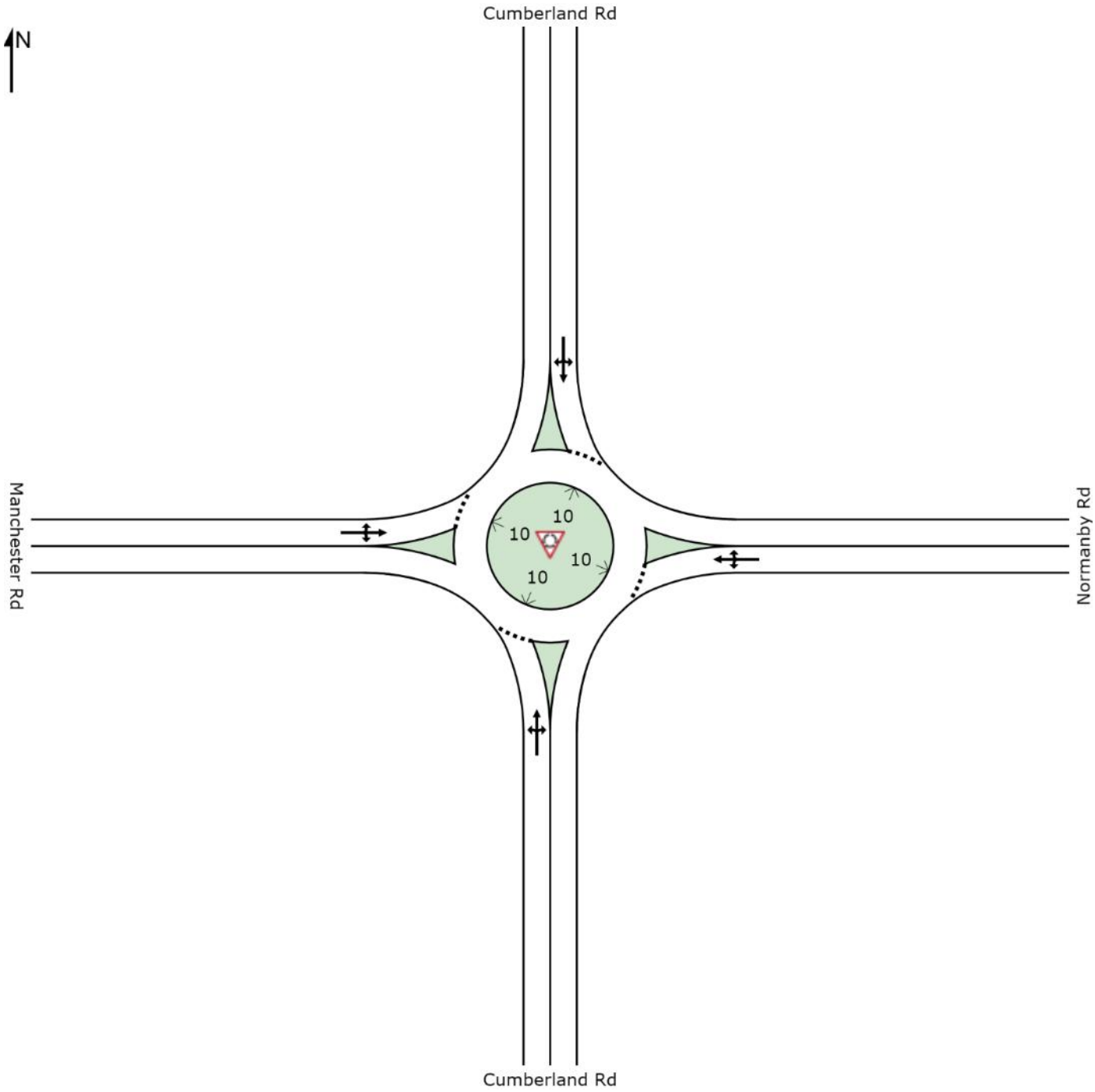
Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects
7 Lane under-utilisation specified by the user

SITE LAYOUT

Site: Manchester Road / Cumberland Road 2017AM

Cumberland Rd / Manchester Rd / The Crescent / Normanby Rd
Roundabout



LANE SUMMARY

Site: Manchester Road / Cumberland Road 2017AM

Cumberland Rd / Manchester Rd / The Crescent / Normanby Rd
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Cumberland Rd													
Lane 1[d]	723	0.0	1290	0.561	100	6.5	LOS A	5.0	35.3	Full	500	0.0	0.0
Approach	723	0.0		0.561		6.5	LOS A	5.0	35.3				
East: Normanby Rd													
Lane 1[d]	74	0.0	898	0.082	100	6.9	LOS A	0.4	3.1	Full	500	0.0	0.0
Approach	74	0.0		0.082		6.9	LOS A	0.4	3.1				
North: Cumberland Rd													
Lane 1[d]	421	0.0	1101	0.383	100	7.1	LOS A	2.6	17.9	Full	500	0.0	0.0
Approach	421	0.0		0.383		7.1	LOS A	2.6	17.9				
West: Manchester Rd													
Lane 1[d]	353	0.0	675	0.522	100	12.3	LOS A	4.4	30.9	Full	500	0.0	0.0
Approach	353	0.0		0.522		12.3	LOS A	4.4	30.9				
Intersection	1571	0.0		0.561		8.0	LOS A	5.0	35.3				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

d Dominant lane on roundabout approach

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LANE SUMMARY

Site: Manchester Road / Cumberland Road 2017PM

Cumberland Rd / Manchester Rd / The Crescent / Normanby Rd
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Cumberland Rd													
Lane 1[d]	387	0.0	1469	0.264	100	5.8	LOS A	1.7	12.2	Full	500	0.0	0.0
Approach	387	0.0		0.264		5.8	LOS A	1.7	12.2				
East: Normanby Rd													
Lane 1[d]	103	0.0	859	0.120	100	7.4	LOS A	0.7	4.7	Full	500	0.0	0.0
Approach	103	0.0		0.120		7.4	LOS A	0.7	4.7				
North: Cumberland Rd													
Lane 1[d]	575	0.0	1236	0.465	100	5.9	LOS A	3.4	23.8	Full	500	0.0	0.0
Approach	575	0.0		0.465		5.9	LOS A	3.4	23.8				
West: Manchester Rd													
Lane 1[d]	236	0.0	962	0.245	100	7.0	LOS A	1.4	9.7	Full	500	0.0	0.0
Approach	236	0.0		0.245		7.0	LOS A	1.4	9.7				
Intersection	1301	0.0		0.465		6.2	LOS A	3.4	23.8				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

d Dominant lane on roundabout approach

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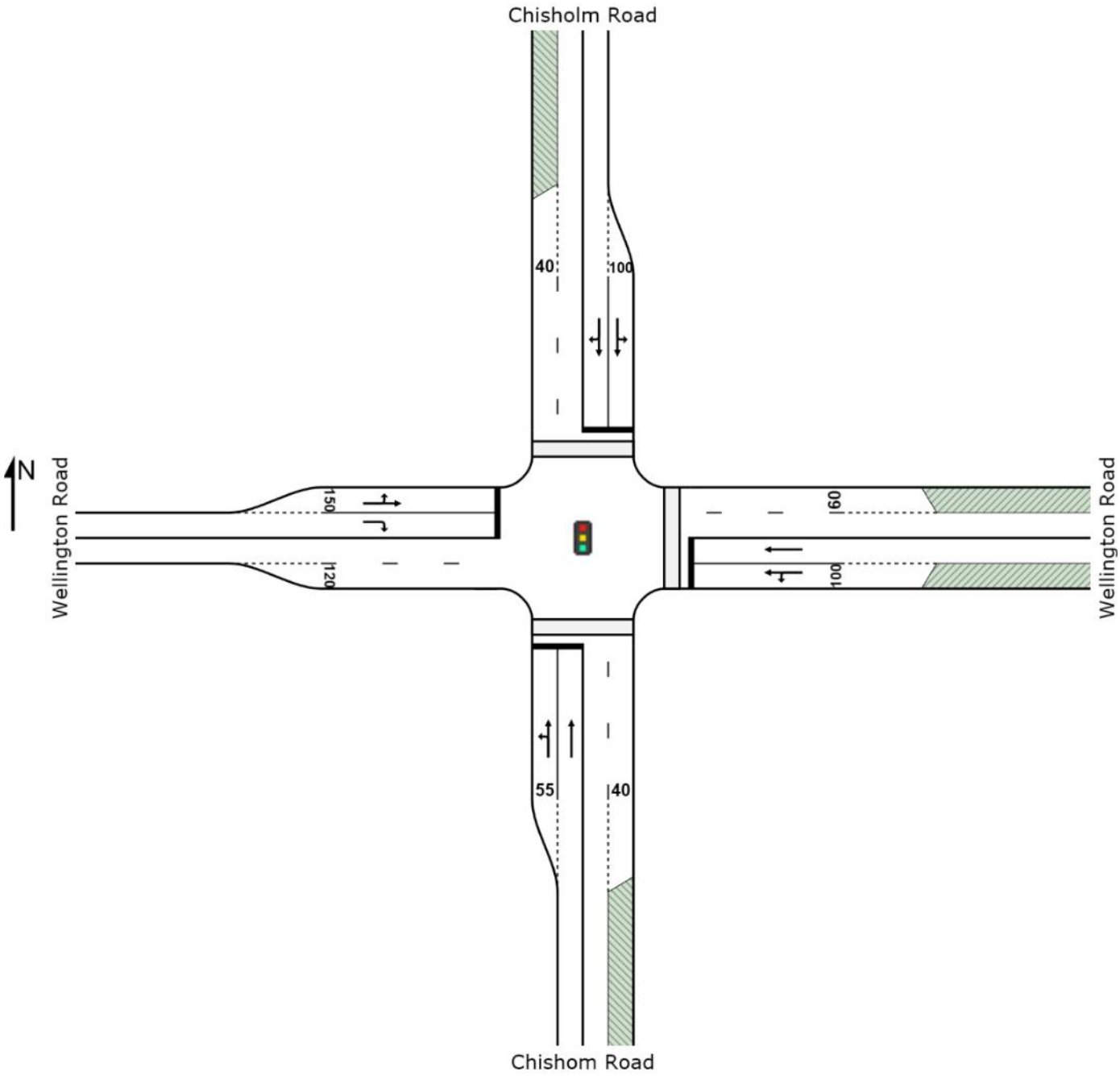
SITE LAYOUT

Site: Chisholm Road / Wellington Road 2018 AM

New Site
Signals - Fixed Time Isolated



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Project: \\Jacobs.com\ANZ\IE\Projects\04_Eastern\IA162400\06 Technical\Sidra Modelling\2018-6-22 Payce Scenario\Intersections Mona Street Upgrade_Payce Scenario v3.sip6

LANE SUMMARY

Site: Chisholm Road / Wellington Road 2018 AM

New Site
Signals - Fixed Time Isolated Cycle Time = 110 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chishom Road													
Lane 1	175	2.0	183	0.954	100	82.6	LOS F	12.0	85.1	Short (P)	55	0.0	NA
Lane 2	176	2.0	191	0.918	96[5]	68.9	LOS E	11.2	79.9	Full	500	0.0	0.0
Approach	351	2.0		0.954		75.7	LOS F	12.0	85.1				
East: Wellington Road													
Lane 1	237	2.0	1151	0.206	66[6]	11.0	LOS A	5.7	40.5	Short (P)	60	0.0	NA
Lane 2	362	2.0	1155	0.314	100	11.5	LOS A	9.4	67.0	Full	500	0.0	0.0
Approach	599	2.0		0.314		11.3	LOS A	9.4	67.0				
North: Chisholm Road													
Lane 1	215	2.0	230[1]	0.936	100	71.3	LOS F	14.1	100.4	Short (P)	40	0.0	NA
Lane 2	208	2.0	226[1]	0.922	99[5]	73.6	LOS F	13.4	95.7	Full	500	0.0	0.0
Approach	423	2.0		0.936		72.4	LOS F	14.1	100.4				
West: Wellington Road													
Lane 1	424	2.0	1166	0.364	37[6]	13.7	LOS A	10.8	76.9	Short	150	0.0	NA
Lane 2	743	2.0	754[1]	0.986	100	77.5	LOS F	60.6	431.5	Full	500	0.0	0.0
Approach	1167	2.0		0.986		54.3	LOS D	60.6	431.5				
Intersection	2540	2.0		0.986		50.1	LOS D	60.6	431.5				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

LANE SUMMARY

Site: Chisholm Road / Wellington Road 2018 PM

New Site
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Practical Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chishom Road													
Lane 1	296	2.0	308[1]	0.959	100	86.5	LOS F	22.3	158.6	Short (P)	55	0.0	NA
Lane 2	205	2.0	367	0.559	58[5]	48.4	LOS D	11.0	78.6	Full	500	0.0	0.0
Approach	501	2.0		0.959		70.9	LOS F	22.3	158.6				
East: Wellington Road													
Lane 1	290	2.0	993	0.292	66[6]	17.6	LOS B	9.5	67.7	Short (P)	60	0.0	NA
Lane 2	427	2.0	958[1]	0.445	100	19.1	LOS B	15.3	108.7	Full	500	0.0	0.0
Approach	717	2.0		0.445		18.5	LOS B	15.3	108.7				
North: Chisholm Road													
Lane 1	145	2.0	271	0.536	56[5]	53.4	LOS D	8.1	57.6	Short (P)	40	0.0	NA
Lane 2	217	2.0	228[1]	0.952	100	86.1	LOS F	15.9	113.5	Full	500	0.0	0.0
Approach	362	2.0		0.952		73.0	LOS F	15.9	113.5				
West: Wellington Road													
Lane 1	354	2.0	1020	0.347	37[6]	19.6	LOS B	11.3	80.8	Short	150	0.0	NA
Lane 2	582	2.0	617	0.942	100	65.6	LOS E	44.0	313.6	Full	500	0.0	0.0
Approach	936	2.0		0.942		48.2	LOS D	44.0	313.6				
Intersection	2516	2.0		0.959		47.8	LOS D	44.0	313.6				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

LANE SUMMARY

Site: 1 [AM Do Min Rawson South Parade]

Network: N101 [AM Do Minimum Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Cycle Time - User-Given)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Railway Bridge															
Lane 1	621	2.0	611	2.0	1175	0.520	100	15.7	LOS B	9.2 N 4	65.3 N4	Full	40	0.0	50.0
Lane 2	441	2.0	434	2.0	626	0.694	100	40.2	LOS C	9.2 N 4	65.3 N4	Full	40	0.0	50.0
Lane 3	441	2.0	434	2.0	626	0.694	100	40.2	LOS C	9.2 N 4	65.3 N4	Full	40	0.0	50.0
Approach	1503	2.0	1479 N1	2.0		0.694		30.1	LOS C	9.2	65.3				
East: Rawson Street															
Lane 1	696	2.0	696	2.0	1190	0.585	100	60.7	LOS E	41.2	293.5	Short	131	0.0	NA
Lane 2	291	2.0	291	2.0	497	0.585	100	42.0	LOS C	15.0	106.5	Full	500	0.0	0.0
Approach	987	2.0	987	2.0		0.585		55.2	LOS D	41.2	293.5				
West: Rawson Street															
Lane 1	109	2.0	109	2.0	1075	0.101	100	13.0	LOS A	2.9	20.7	Full	500	0.0	0.0
Lane 2	109	2.0	109	2.0	1075	0.101	100	13.0	LOS A	2.9	20.7	Full	500	0.0	6.3 8
Lane 3	513	2.0	513	2.0	428 1	1.197	100	258.8	LOS F	71.3	507.4	Short	67	0.0	NA
Approach	731	2.0	731	2.0		1.197		185.5	LOS F	71.3	507.4				
Intersection	3221	2.0	3197 N1	2.0		1.197		73.3	LOS F	71.3	507.4				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
8 Probability of Blockage has been set on the basis of a queue that overflows from an adjacent short lane.
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
N4 Average back of queue has been restricted to the available queue storage space.

LANE SUMMARY

Site: 101 [AM Do MIn S Parade]

Network: N101 [AM Do Minimum Network]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: S Parade															
Lane 1	501	2.0	480	2.0	962	0.499	100	0.0	LOS A	14.8 N5	105.6 N5	Full	45	-50.0 N3	44.0 N5
Lane 2	501	2.0	480	2.0	962	0.499	100	0.0	LOS A	15.7 N6	111.8 N6	Full	45	-50.0 N3	49.9 N6
Lane 3	501	2.0	480	2.0	962	0.499	100	0.0	LOS A	15.7 N6	111.8 N6	Short	30	-50.0 N3	NA
Approach	1503	2.0	1441 N1	2.0		0.499		0.0	NA	15.7	111.8				
East: S Parade															
Lane 1	77	2.0	77	2.0	824	0.093	100	6.8	LOS A	0.3	2.4	Full	500	-21.1 N3	0.0
Approach	77	2.0	77	2.0		0.093		6.8	LOS A	0.3	2.4				
North: Railway Bridge															
Lane 1	594	2.0	549	2.0	1651	0.333	100	1.7	LOS A	0.0	0.0	Full	40	-12.1 N3	0.0
Lane 2	525	2.0	485	2.0	1459	0.333	100	0.0	LOS A	0.0	0.0	Full	40	-24.2 N3	0.0
Approach	1119	2.0	1035 N1	2.0		0.333		0.9	NA	0.0	0.0				
Intersection	2699	2.0	2552 N1	2.1		0.499		0.6	NA	15.7	111.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.
N6 Continuous Lane results determined by Back of Queue values of downstream lanes but average back of queue has been restricted to the available queue storage space.

LANE SUMMARY

Site: 101v [AM Future S Parade Alice]

Network: N101 [AM Future Network]

New Site
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: RoadName															
Lane 1	194	2.0	194	2.0	265	0.732	100	31.5	LOS C	6.1	43.1	Short	60	-48.8 N3	NA
Lane 2	190	2.0	190	2.0	260	0.732	100	31.6	LOS C	5.9	42.3	Full	500	-49.9 N3	0.0
Approach	384	2.0	384	2.0		0.732		31.6	LOS C	6.1	43.1				
East: RoadName															
Lane 1	236	2.0	232	2.0	950	0.244	37 6	12.1	LOS A	3.8	26.8	Full	45	0.0	0.0
Lane 2	671	2.0	658	2.0	995	0.661	100	11.6	LOS A	10.3 N4	73.4 N4	Full	45	0.0	50.0
Approach	907	2.0	889 N1	2.0		0.661		11.7	LOS A	10.3	73.4				
West: RoadName															
Lane 1	376	2.0	376	2.0	498	0.755	100	17.3	LOS B	10.5	74.5	Short	60	-49.9 N3	NA
Lane 2	376	2.0	376	2.0	498	0.755	100	17.3	LOS B	10.5	74.5	Full	500	-49.9 N3	0.0
Lane 3	376	2.0	376	2.0	498	0.755	100	17.3	LOS B	10.5	74.5	Short	60	-49.9 N3	NA
Approach	1127	2.0	1127	2.0		0.755		17.3	LOS B	10.5	74.5				
Intersection	2419	2.0	2401 N1	2.0		0.755		17.5	LOS B	10.5	74.5				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

6 Lane under-utilisation due to downstream effects
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

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LANE SUMMARY

Site: 1 [PM Do Min Rawson South Parade]

Network: N101 [PM Do Min Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Cycle Time - User-Given)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Railway Bridge															
Lane 1	341	2.0	341	2.0	1343	0.254	100	9.0	LOS A	6.4	45.5	Full	40	0.0	16.6
Lane 2	363	2.0	363	2.0	504	0.721	100	46.5	LOS D	9.2 N4	65.3 N4	Full	40	0.0	50.0
Lane 3	363	2.0	363	2.0	504	0.721	100	46.5	LOS D	9.2 N4	65.3 N4	Full	40	0.0	50.0
Approach	1067	2.0	1067	2.0		0.721		34.5	LOS C	9.2	65.3				
East: Rawson Street															
Lane 1	723	2.0	723	2.0	805 1	0.899	100	46.8	LOS D	43.0	306.1	Short	131	0.0	NA
Lane 2	287	2.0	287	2.0	321	0.896	100 5	65.7	LOS E	19.2	136.7	Full	500	0.0	0.0
Approach	1011	2.0	1011	2.0		0.899		52.1	LOS D	43.0	306.1				
West: Rawson Street															
Lane 1	455	2.0	455	2.0	1203	0.378	42 5	11.7	LOS A	12.8	91.2	Full	500	0.0	0.0
Lane 2	456	2.0	456	2.0	506 1	0.900	100	54.8	LOS D	27.2	193.6	Full	500	0.0	0.0
Lane 3	322	2.0	322	2.0	358 1	0.900	100	66.2	LOS E	23.1	164.3	Short	67	-49.9 N3	NA
Approach	1233	2.0	1233	2.0		0.900		41.9	LOS C	27.2	193.6				
Intersection	3311	2.0	3311	2.0		0.900		42.6	LOS D	43.0	306.1				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

LANE SUMMARY

Site: 101 [PM Do MIn S Parade]

Network: N101 [PM Do Min Network]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: S Parade															
Lane 1	485	2.0	485	2.0	1605	0.302	100	0.0	LOS A	0.0	0.0	Full	45	-16.6 [N3]	0.0
Lane 2	291	2.0	291	2.0	962	0.302	100	0.0	LOS A	14.0 [N5]	99.9 [N5]	Full	45	-50.0 [N3]	39.4 [N5]
Lane 3	291	2.0	291	2.0	962	0.302	100	0.0	LOS A	14.0 [N5]	99.9 [N5]	Short	30	-50.0 [N3]	NA
Approach	1067	2.0	1067	2.0		0.302		0.0	NA	14.0	99.9				
East: S Parade															
Lane 1	77	2.0	77	2.0	676	0.114	100	9.8	LOS A	0.5	3.5	Full	500	0.0	0.0
Approach	77	2.0	77	2.0		0.114		9.8	LOS A	0.5	3.5				
North: Railway Bridge															
Lane 1	995	2.0	995	2.0	1895	0.525	100	1.1	LOS A	0.0	0.0	Full	40	0.0	0.0
Lane 2	505	2.0	505	2.0	962	0.525	100	0.0	LOS A	14.0 [N6]	99.4 [N6]	Full	40	-50.0 [N3]	49.9 [N6]
Approach	1500	2.0	1500	2.0		0.525		0.7	NA	14.0	99.4				
Intersection	2644	2.0	2644	2.0		0.525		0.7	NA	14.0	99.9				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.
N6 Continuous Lane results determined by Back of Queue values of downstream lanes but average back of queue has been restricted to the available queue storage space.

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LANE SUMMARY

Site: 101v [PM Do Min S Parade Alice]

Network: N101 [PM Do Min Network]

New Site
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Alice Street															
Lane 1	3	2.0	3	2.0	610	0.005	100	19.8	LOS B	0.1	0.4	Short	60	0.0	NA
Lane 2	356	2.0	356	2.0	370	0.961	100	61.9	LOS E	17.7	125.8	Full	500	-39.4 N3	0.0
Approach	359	2.0	359	2.0		0.961		61.5	LOS E	17.7	125.8				
East: S Parade															
Lane 1	305	2.0	305	2.0	854	0.357	36 5	14.9	LOS B	5.8	41.2	Full	45	0.0	0.0
Lane 2	891	2.0	891	2.0	898	0.991	100	59.7	LOS E	10.3 N4	73.4 N4	Full	45	0.0	50.0
Approach	1196	2.0	1196	2.0		0.991		48.3	LOS D	10.3	73.4				
West: S Parade															
Lane 1	443	2.0	443	2.0	898	0.493	100	12.1	LOS A	9.1	64.7	Full	500	0.0	0.0
Lane 2	269	2.0	269	2.0	545	0.493	100	12.4	LOS A	5.6	40.2	Short	60	-39.4 N3	NA
Approach	712	2.0	712	2.0		0.493		12.2	LOS A	9.1	64.7				
Intersection	2266	2.0	2266	2.0		0.991		39.0	LOS C	17.7	125.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

5 Lane under-utilisation found by the program
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

LANE SUMMARY

Site: 101 [Clyde Hudson Do Minimum]

Network: N101 [2017 AM Do Minimum]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde Street															
Lane 1	443	2.0	443	2.0	981	0.452	100	0.4	LOS A	14.1 N5	100.2 N5	Short	125	-48.9 N3	NA
Lane 2	435	2.0	435	2.0	962	0.452	100	0.1	LOS A	32.8 N5	233.3 N5	Full	500	-50.0 N3	0.0
Approach	878	2.0	878	2.0		0.452		0.3	NA	32.8	233.3				
North: Clyde Street															
Lane 1	423	2.0	423	2.0	1925	0.220	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	423	2.0	423	2.0		0.220		0.0	NA	0.0	0.0				
West: Hudson Street															
Lane 1	127	2.0	127	2.0	538	0.237	100	7.3	LOS A	0.5	3.4	Full	500	-50.0 N3	0.0
Approach	127	2.0	127	2.0		0.237		7.3	LOS A	0.5	3.4				
Intersection	1428	2.0	1428	2.0		0.452		0.8	NA	32.8	233.3				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.

LANE SUMMARY

Site: 101 [Clyde Redfern Do Min]

Network: N101 [2017 AM Do Minimum]

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde Street (South)															
Lane 1[d]	1035	2.0	1029	2.0	1884	0.546	100	3.4	LOS A	6.3	45.1	Full	50	0.0	2.0
Approach	1035	2.0	1029[N1]	2.0		0.546		3.4	LOS A	6.3	45.1				
North: Clyde Street (North)															
Lane 1[d]	662	2.0	662	2.0	585	1.133	100	145.6	LOS F	63.9	455.2	Full	500	-49.2[N3]	2.3
Approach	662	2.0	662	2.0		1.133		145.6	LOS F	63.9	455.2				
West: Redfern Street															
Lane 1[d]	393	2.0	393	2.0	522	0.753	100	18.0	LOS B	6.9	49.3	Full	500	-49.2[N3]	0.0
Approach	393	2.0	393	2.0		0.753		18.0	LOS B	6.9	49.3				
Intersection	2089	2.0	2084[N1]	2.0		1.133		51.3	LOS D	63.9	455.2				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

d Dominant lane on roundabout approach
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

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LANE SUMMARY

Site: 1 [Mona Street / Clyde Street Do Min]

Network: N101 [2017 AM Do Minimum]

Clyde St / Mona St
Signals - Fixed Time Isolated Cycle Time = 110 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde St															
Lane 1	456	2.0	456	2.0	945	0.482	56[5]	19.9	LOS B	4.1[N 4]	29.4[N4]	Full	18	0.0	50.0
Lane 2	531	2.0	531	2.0	619	0.858	100	49.6	LOS D	4.1[N 4]	29.4[N4]	Full	18	0.0	50.0
Approach	986	2.0	986	2.0		0.858		35.9	LOS C	4.1	29.4				
East: Mona St															
Lane 1	265	2.0	265	2.0	1365	0.194	100	9.0	LOS A	4.1	29.5	Short (P)	50	0.0	NA
Lane 2	579	2.0	579	2.0	566[1]	1.023	100	119.7	LOS F	52.6	374.6	Full	500	-2.2[N3]	0.0
Approach	844	2.0	844	2.0		1.023		84.9	LOS F	52.6	374.6				
North: Clyde St															
Lane 1	864	2.0	864	2.0	960[1]	0.900	100	35.6	LOS C	11.5[N 4]	81.6[N4]	Short	35	0.0	NA
Lane 2	158	2.0	158	2.0	280	0.564	63[5]	48.4	LOS D	8.1	57.7	Full	50	0.0	50.0[8]
Approach	1022	2.0	1022	2.0		0.900		37.6	LOS C	11.5	81.6				
Intersection	2853	2.0	2853	2.0		1.023		51.0	LOS D	52.6	374.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
8 Probability of Blockage has been set on the basis of a queue that overflows from an adjacent short lane.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

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LANE SUMMARY

Site: 3 [Clyde Hudson Do Minimum PM]

Network: N101 [2017 PM Do Minimum]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde Street															
Lane 1	309	2.0	309	2.0	1014	0.305	100	0.7	LOS A	19.0 N5	135.4 N5	Short	125	-47.0 N3	NA
Lane 2	293	2.0	293	2.0	962	0.305	100	0.1	LOS A	8.2 N5	58.5 N5	Full	500	-50.0 N3	0.0
Approach	602	2.0	602	2.0		0.305		0.4	NA	19.0	135.4				
North: Clyde Street															
Lane 1	637	2.0	603	2.0	1925	0.313	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	637	2.0	603 N1	2.0		0.313		0.0	NA	0.0	0.0				
West: Hudson Street															
Lane 1	12	2.0	12	2.0	631	0.018	100	6.4	LOS A	0.0	0.3	Full	500	-50.0 N3	0.0
Approach	12	2.0	12	2.0		0.018		6.4	LOS A	0.0	0.3				
Intersection	1251	2.0	1217 N1	2.1		0.313		0.3	NA	19.0	135.4				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.

LANE SUMMARY

Site: 101 [Clyde Redfern 2017 PM Do Minimum]

Network: N101 [2017 PM Do Minimum]

New Site
Roundabout

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde Street (South)															
Lane 1[d]	1255	2.0	1185	2.0	1885	0.629	100	3.4	LOS A	8.8	62.7	Full	50	0.0	12.1
Approach	1255	2.0	1185[N1]	2.0		0.629		3.4	LOS A	8.8	62.7				
North: Clyde Street (North)															
Lane 1[d]	728	2.0	728	2.0	602	1.211	100	211.6	LOS F	94.3	671.7	Full	500	-49.2[N3]	14.5
Approach	728	2.0	728	2.0		1.211		211.6	LOS F	94.3	671.7				
West: Redfern Street															
Lane 1[d]	371	2.0	371	2.0	483	0.767	100	22.4	LOS B	9.0	64.0	Full	500	-49.1[N3]	0.0
Approach	371	2.0	371	2.0		0.767		22.4	LOS B	9.0	64.0				
Intersection	2354	2.0	2284[N1]	2.1		1.211		72.9	LOS F	94.3	671.7				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

d Dominant lane on roundabout approach
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

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LANE SUMMARY

Site: 1 [Mona Street / Clyde Street Do minimum PM]

Network: N101 [2017 PM Do Minimum]

Clyde St / Mona St
Signals - Fixed Time Isolated Cycle Time = 110 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Clyde St															
Lane 1	408	2.0	408	2.0	735	0.556	67[5]	28.6	LOS C	4.1[N 4]	29.4[N4]	Full	18	0.0	50.0
Lane 2	171	2.0	171	2.0	205	0.833	100	62.1	LOS E	4.1[N 4]	29.4[N4]	Full	18	0.0	50.0
Approach	579	2.0	579	2.0		0.833		38.5	LOS C	4.1	29.4				
East: Mona St															
Lane 1	359	2.0	359	2.0	1165	0.308	100	14.1	LOS A	8.6	60.9	Short (P)	140	0.0	NA
Lane 2	846	2.0	846	2.0	770[1]	1.099	100	162.6	LOS F	95.4	679.0	Full	500	-12.4[N3]	32.9
Approach	1205	2.0	1205	2.0		1.099		118.4	LOS F	95.4	679.0				
North: Clyde St															
Lane 1	779	2.0	747	2.0	1154[1]	0.648	58[5]	7.2	LOS A	11.5[N 4]	81.6[N4]	Short	35	0.0	NA
Lane 2	284	2.0	273	2.0	246[1]	1.110	100	222.9	LOS F	11.5[N 4]	81.6[N4]	Full	50	0.0	50.0
Approach	1063	2.0	1020[N1]	2.0		1.110		64.8	LOS E	11.5	81.6				
Intersection	2847	2.0	2804[N1]	2.0		1.110		82.4	LOS F	95.4	679.0				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

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LANE SUMMARY

Site: DO Min Mona Street / Chrisholm Road

Mona Street / Chrisholm Road
Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Phase Times)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chisholm Rd													
Lane 1	395	2.8	941	0.420	100	23.6	LOS B	14.1	100.8	Short (P)	140	0.0	NA
Lane 2	127	2.8	559	0.228	100	34.5	LOS C	5.6	40.3	Full	500	0.0	0.0
Approach	522	2.8		0.420		26.3	LOS B	14.1	100.8				
East: Mona St													
Lane 1	150	2.8	732	0.204	87[6]	26.6	LOS B	5.8	41.5	Short (P)	40	0.0	NA
Lane 2	173	2.8	734	0.235	100	26.7	LOS B	6.8	48.5	Full	500	0.0	0.0
Approach	322	2.8		0.235		26.6	LOS B	6.8	48.5				
North: Chisholm Rd													
Lane 1	92	2.8	558	0.164	19[5]	33.8	LOS C	4.0	28.4	Short (P)	20	0.0	NA
Lane 2	179	2.8	205[1]	0.872	100	68.8	LOS E	12.2	87.2	Full	500	0.0	0.0
Approach	271	2.8		0.872		57.0	LOS E	12.2	87.2				
West: Mona St													
Lane 1	814	2.8	1130	0.721	43[6]	20.1	LOS B	32.8	234.8	Short	300	0.0	NA
Lane 2	728	2.8	872	0.834	50[7]	30.0	LOS C	35.8	256.5	Full	500	0.0	0.0
Approach	1542	2.8		0.834		24.8	LOS B	35.8	256.5				
Intersection	2657	2.8		0.872		28.6	LOS C	35.8	256.5				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects
7 Lane under-utilisation specified by the user

LANE SUMMARY

Site: DO Min Mona Street / Chrisholm Road

Mona Street / Chrisholm Road
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chisholm Rd													
Lane 1	519	2.8	1064	0.488	100	21.2	LOS B	18.8	134.6	Short (P)	140	0.0	NA
Lane 2	128	2.8	619	0.208	100	34.0	LOS C	5.8	41.9	Full	500	0.0	0.0
Approach	647	2.8		0.488		23.7	LOS B	18.8	134.6				
East: Mona St													
Lane 1	311	2.8	400[1]	0.778	87[6]	42.1	LOS C	16.9	121.2	Short (P)	40	0.0	NA
Lane 2	376	2.8	421[1]	0.895	100	57.0	LOS E	24.7	176.9	Full	500	0.0	0.0
Approach	687	2.8		0.895		50.3	LOS D	24.7	176.9				
North: Chisholm Rd													
Lane 1	93	2.8	618	0.150	11[5]	33.4	LOS C	4.1	29.6	Short (P)	20	0.0	NA
Lane 2	273	2.8	205[1]	1.329	100	390.0	LOS F	49.5	354.6	Full	500	0.0	0.0
Approach	365	2.8		1.329		299.6	LOS F	49.5	354.6				
West: Mona St													
Lane 1	469	2.8	1081	0.434	43[6]	18.4	LOS B	16.2	116.4	Short	60	0.0	NA
Lane 2	329	2.8	655	0.502	50[7]	34.7	LOS C	16.1	115.6	Full	500	0.0	0.0
Approach	798	2.8		0.502		25.1	LOS B	16.2	116.4				
Intersection	2498	2.8		1.329		71.8	LOS F	49.5	354.6				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects
7 Lane under-utilisation specified by the user

LANE SUMMARY

Site: Do Minimum - Manchester Road / Cumberland Road AM

Cumberland Rd / Manchester Rd / The Crescent / Normanby Rd
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Cumberland Rd													
Lane 1[d]	786	0.0	900	0.873	100	19.3	LOS B	17.5	122.8	Full	500	0.0	0.0
Approach	786	0.0		0.873		19.3	LOS B	17.5	122.8				
East: Normanby Rd													
Lane 1[d]	74	0.0	605	0.122	100	9.6	LOS A	0.8	5.4	Full	500	0.0	0.0
Approach	74	0.0		0.122		9.6	LOS A	0.8	5.4				
North: Cumberland Rd													
Lane 1[d]	713	0.0	1068	0.667	100	10.0	LOS A	7.2	50.5	Full	500	0.0	0.0
Approach	713	0.0		0.667		10.0	LOS A	7.2	50.5				
West: Manchester Rd													
Lane 1[d]	631	0.0	584	1.080	100	114.7	LOS F	53.3	372.9	Full	500	0.0	0.0
Approach	631	0.0		1.080		114.7	LOS F	53.3	372.9				
Intersection	2203	0.0		1.080		43.2	LOS D	53.3	372.9				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: Do Minimum- Manchester Road / Cumberland Road PM

Cumberland Rd / Manchester Rd / The Crescent / Normanby Rd
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Cumberland Rd													
Lane 1[d]	434	0.0	919	0.472	100	8.3	LOS A	3.5	24.2	Full	500	0.0	0.0
Approach	434	0.0		0.472		8.3	LOS A	3.5	24.2				
East: Normanby Rd													
Lane 1[d]	128	0.0	541	0.237	100	11.1	LOS A	1.6	11.2	Full	500	0.0	0.0
Approach	128	0.0		0.237		11.1	LOS A	1.6	11.2				
North: Cumberland Rd													
Lane 1[d]	788	0.0	1153	0.684	100	8.7	LOS A	7.3	51.0	Full	500	0.0	0.0
Approach	788	0.0		0.684		8.7	LOS A	7.3	51.0				
West: Manchester Rd													
Lane 1[d]	595	0.0	928	0.641	100	9.8	LOS A	6.7	46.8	Full	500	0.0	0.0
Approach	595	0.0		0.641		9.8	LOS A	6.7	46.8				
Intersection	1945	0.0		0.684		9.1	LOS A	7.3	51.0				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

d Dominant lane on roundabout approach

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LANE SUMMARY

Site: Do Min Chisholm Road / Wellington Road 2018 AM

New Site
Signals - Fixed Time Isolated Cycle Time = 110 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chishom Road													
Lane 1	175	2.0	183	0.954	100	82.6	LOS F	12.0	85.1	Short (P)	55	0.0	NA
Lane 2	182	2.0	192	0.951	100[5]	76.0	LOS F	12.3	87.6	Full	500	0.0	0.0
Approach	357	2.0		0.954		79.2	LOS F	12.3	87.6				
East: Wellington Road													
Lane 1	237	2.0	1151	0.206	66[6]	11.0	LOS A	5.7	40.5	Short (P)	60	0.0	NA
Lane 2	362	2.0	1155	0.314	100	11.5	LOS A	9.4	67.0	Full	500	0.0	0.0
Approach	599	2.0		0.314		11.3	LOS A	9.4	67.0				
North: Chisholm Road													
Lane 1	225	2.0	223[1]	1.009	100	111.0	LOS F	18.1	129.0	Short (P)	40	0.0	NA
Lane 2	206	2.0	227[1]	0.909	90[5]	71.0	LOS F	13.0	92.6	Full	500	0.0	0.0
Approach	432	2.0		1.009		91.9	LOS F	18.1	129.0				
West: Wellington Road													
Lane 1	428	2.0	1167	0.367	37[6]	13.8	LOS A	10.9	77.9	Short	150	0.0	NA
Lane 2	745	2.0	749[1]	0.995	100	82.5	LOS F	62.5	444.8	Full	500	0.0	0.0
Approach	1174	2.0		0.995		57.4	LOS E	62.5	444.8				
Intersection	2561	2.0		1.009		55.5	LOS D	62.5	444.8				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

LANE SUMMARY

Site: DO Min Chisholm Road / Wellington Road 2018 PM

New Site
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Practical Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chishom Road													
Lane 1	296	2.0	306[1]	0.966	100	89.3	LOS F	22.7	161.3	Short (P)	55	0.0	NA
Lane 2	216	2.0	367	0.588	61[5]	48.7	LOS D	11.7	83.1	Full	500	0.0	0.0
Approach	512	2.0		0.966		72.2	LOS F	22.7	161.3				
East: Wellington Road													
Lane 1	292	2.0	977	0.299	66[6]	18.3	LOS B	9.7	69.4	Short (P)	60	0.0	NA
Lane 2	425	2.0	933[1]	0.455	100	19.7	LOS B	15.5	110.1	Full	500	0.0	0.0
Approach	717	2.0		0.455		19.1	LOS B	15.5	110.1				
North: Chisholm Road													
Lane 1	158	2.0	287	0.550	58[5]	52.6	LOS D	8.8	62.4	Short (P)	40	0.0	NA
Lane 2	225	2.0	236[1]	0.955	100	87.0	LOS F	16.7	118.9	Full	500	0.0	0.0
Approach	383	2.0		0.955		72.8	LOS F	16.7	118.9				
West: Wellington Road													
Lane 1	358	2.0	1007	0.356	37[6]	19.7	LOS B	11.5	82.1	Short	150	0.0	NA
Lane 2	585	2.0	607	0.964	100	75.6	LOS F	47.5	338.0	Full	500	0.0	0.0
Approach	943	2.0		0.964		54.4	LOS D	47.5	338.0				
Intersection	2555	2.0		0.966		50.8	LOS D	47.5	338.0				

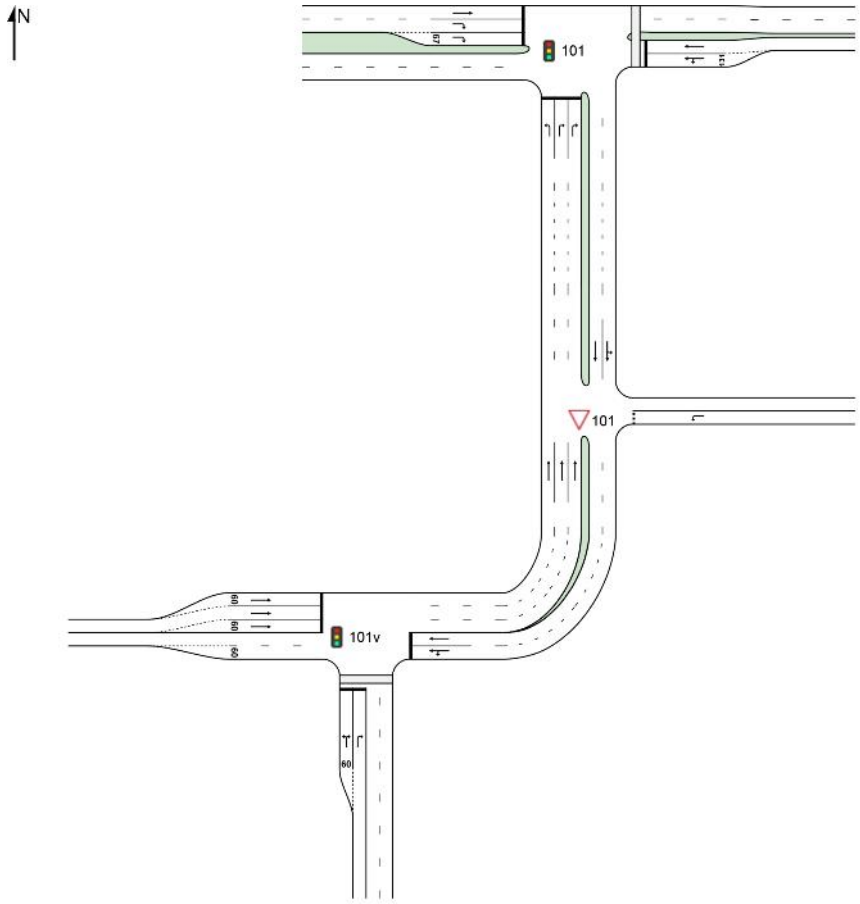
Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

NETWORK LAYOUT

Network: N101 [AM Future Network]

New Network



SITES IN NETWORK	
Site ID	**Site Name**
101	AM Future Rawson South Parade
101	AM Future S Parade
101v	AM Future S Parade Alice

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LANE SUMMARY

Site: 101 [AM Future Rawson South Parade]

Network: N101 [AM Future Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Cycle Time - User-Given)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: RoadName															
Lane 1	621	2.0	621	2.0	1099	0.565	100	18.9	LOS B	9.2 N4	65.3 N4	Full	40	0.0	50.0
Lane 2	441	2.0	441	2.0	763	0.578	100	32.2	LOS C	9.2 N4	65.3 N4	Full	40	0.0	50.0
Lane 3	441	2.0	441	2.0	763	0.578	100	32.2	LOS C	9.2 N4	65.3 N4	Full	40	0.0	50.0
Approach	1503	2.0	1503	2.0		0.578		26.7	LOS B	9.2	65.3				
East: RoadName															
Lane 1	700	2.0	700	2.0	1404	0.498	100	54.4	LOS D	41.2	293.1	Short	131	0.0	NA
Lane 2	288	2.0	288	2.0	577	0.498	100	37.2	LOS C	13.9	98.7	Full	500	0.0	0.0
Approach	987	2.0	987	2.0		0.498		49.4	LOS D	41.2	293.1				
West: RoadName															
Lane 1	218	2.0	218	2.0	930	0.234	100	19.1	LOS B	7.3	52.0	Full	500	0.0	0.0
Lane 2	256	2.0	256	2.0	244	1.050	100	137.7	LOS F	24.6	174.8	Full	500	0.0	0.0
Lane 3	256	2.0	256	2.0	244	1.050	100	137.7	LOS F	24.6	174.8	Short	67	0.0	NA
Approach	731	2.0	731	2.0		1.050		102.4	LOS F	24.6	174.8				
Intersection	3221	2.0	3221	2.0		1.050		50.8	LOS D	41.2	293.1				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

N4 Average back of queue has been restricted to the available queue storage space.

LANE SUMMARY

Site: 101 [AM Future S Parade]

Network: N101 [AM Future Network]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: RoadName															
Lane 1	501	2.0	501	2.0	962	0.521	100	0.0	LOS A	15.7 N6	111.8 N6	Full	45	-50.0 N3	49.9 N6
Lane 2	501	2.0	501	2.0	962	0.521	100	0.0	LOS A	15.7 N6	111.8 N6	Full	45	-50.0 N3	49.9 N6
Lane 3	501	2.0	501	2.0	962	0.521	100	0.0	LOS A	15.7 N6	111.8 N6	Full	45	-50.0 N3	49.9 N6
Approach	1503	2.0	1503	2.0		0.521		0.0	NA	15.7	111.8				
East: RoadName															
Lane 1	77	2.0	77	2.0	895	0.086	100	7.8	LOS A	0.4	2.8	Full	500	0.0	0.0
Approach	77	2.0	77	2.0		0.086		7.8	LOS A	0.4	2.8				
North: RoadName															
Lane 1	741	2.0	725	2.0	1887	0.384	100	1.4	LOS A	0.0	0.0	Full	40	0.0	0.0
Lane 2	378	2.0	370	2.0	962	0.384	100	0.0	LOS A	0.3 N5	1.8 N5	Full	40	-50.0 N3	0.0
Approach	1119	2.0	1095 N1	2.0		0.384		0.9	NA	0.3	1.8				
Intersection	2699	2.0	2675 N1	2.0		0.521		0.6	NA	15.7	111.8				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.
N6 Continuous Lane results determined by Back of Queue values of downstream lanes but average back of queue has been restricted to the available queue storage space.

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LANE SUMMARY

Site: 101v [AM Future S Parade Alice]

Network: N101 [AM Future Network]

New Site
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: RoadName															
Lane 1	194	2.0	194	2.0	265	0.732	100	31.5	LOS C	6.1	43.1	Short	60	-48.8 N3	NA
Lane 2	190	2.0	190	2.0	260	0.732	100	31.6	LOS C	5.9	42.3	Full	500	-49.9 N3	0.0
Approach	384	2.0	384	2.0		0.732		31.6	LOS C	6.1	43.1				
East: RoadName															
Lane 1	219	2.0	215	2.0	946	0.227	42 5	12.3	LOS A	3.5	24.6	Full	45	0.0	0.0
Lane 2	542	2.0	531	2.0	995	0.534	100	10.5	LOS A	10.3 N4	73.4 N4	Full	45	0.0	50.0
Approach	761	2.0	746 N1	2.0		0.534		11.0	LOS A	10.3	73.4				
West: RoadName															
Lane 1	376	2.0	376	2.0	498	0.755	100	17.3	LOS B	10.5	74.5	Short	60	-49.9 N3	NA
Lane 2	376	2.0	376	2.0	498	0.755	100	17.3	LOS B	10.5	74.5	Full	500	-49.9 N3	0.0
Lane 3	376	2.0	376	2.0	498	0.755	100	17.3	LOS B	10.5	74.5	Short	60	-49.9 N3	NA
Approach	1127	2.0	1127	2.0		0.755		17.3	LOS B	10.5	74.5				
Intersection	2273	2.0	2257 N1	2.0		0.755		17.7	LOS B	10.5	74.5				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

5 Lane under-utilisation found by the program
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

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LANE SUMMARY

Site: 1 [PM Future Rawson South Parade]

Network: N101 [PM Future Network]

New Site
Signals - Fixed Time Coordinated Cycle Time = 120 seconds (Network Cycle Time - User-Given)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Railway Bridge															
Lane 1	341	2.0	341	2.0	1358	0.251	100	8.7	LOS A	6.2	44.0	Full	40	0.0	13.7
Lane 2	363	2.0	363	2.0	626	0.580	100	38.4	LOS C	9.2 N4	65.3 N4	Full	40	0.0	50.0
Lane 3	363	2.0	363	2.0	626	0.580	100	38.4	LOS C	9.2 N4	65.3 N4	Full	40	0.0	50.0
Approach	1067	2.0	1067	2.0		0.580		28.9	LOS C	9.2	65.3				
East: Rawson Street															
Lane 1	776	2.0	776	2.0	1007	0.770	100	83.8	LOS F	47.0	334.6	Short	131	0.0	NA
Lane 2	235	2.0	235	2.0	305	0.770	100	55.9	LOS D	14.0	99.6	Full	500	0.0	0.0
Approach	1011	2.0	1011	2.0		0.770		77.3	LOS F	47.0	334.6				
West: Rawson Street															
Lane 1	455	2.0	455	2.0	1075	0.423	46 5	16.2	LOS B	15.1	107.7	Full	500	0.0	0.0
Lane 2	427	2.0	427	2.0	466 1	0.915	100	62.8	LOS E	27.5	195.9	Full	500	0.0	0.0
Lane 3	351	2.0	351	2.0	384 1	0.915	100	68.9	LOS E	24.7	176.1	Short	67	-32.2 N3	NA
Approach	1233	2.0	1233	2.0		0.915		47.4	LOS D	27.5	195.9				
Intersection	3311	2.0	3311	2.0		0.915		50.5	LOS D	47.0	334.6				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

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LANE SUMMARY

Site: 101 [PM Future S Parade - Copy]

Network: N101 [PM Future Network]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: S Parade															
Lane 1	494	2.0	494	2.0	1661	0.298	100	0.0	LOS A	0.0	0.0	Full	45	-13.7 [N3]	0.0
Lane 2	286	2.0	286	2.0	962	0.298	100	0.0	LOS A	12.2 [N 5]	87.1 [N5]	Full	45	-50.0 [N3]	30.4 [N 5]
Lane 3	286	2.0	286	2.0	962	0.298	100	0.0	LOS A	12.2 [N 5]	87.1 [N5]	Full	45	-50.0 [N3]	30.4 [N 5]
Approach	1067	2.0	1067	2.0		0.298		0.0	NA	12.2	87.1				
East: S Parade															
Lane 1	77	2.0	77	2.0	677	0.114	100	9.8	LOS A	0.5	3.5	Full	500	0.0	0.0
Approach	77	2.0	77	2.0		0.114		9.8	LOS A	0.5	3.5				
North: Railway Bridge															
Lane 1	995	2.0	995	2.0	1895	0.525	100	1.1	LOS A	0.0	0.0	Full	40	0.0	0.0
Lane 2	505	2.0	505	2.0	962	0.525	100	0.0	LOS A	11.2 [N 5]	79.9 [N5]	Full	40	-50.0 [N3]	32.2 [N 5]
Approach	1500	2.0	1500	2.0		0.525		0.7	NA	11.2	79.9				
Intersection	2644	2.0	2644	2.0		0.525		0.7	NA	12.2	87.1				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.

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LANE SUMMARY

Site: 101v [PM Future S Parade Alice - Copy]

Network: N101 [PM Future Network]

New Site
Signals - Fixed Time Isolated Cycle Time = 60 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Alice Street															
Lane 1	180	2.0	180	2.0	245	0.733	100	34.8	LOS C	5.7	40.5	Short	60	-26.9 N3	NA
Lane 2	179	2.0	179	2.0	244	0.733	100	34.8	LOS C	5.7	40.3	Full	500	-27.3 N3	0.0
Approach	359	2.0	359	2.0		0.733		34.8	LOS C	5.7	40.5				
East: S Parade															
Lane 1	311	2.0	311	2.0	1130	0.275	37 6	9.4	LOS A	4.2	29.9	Full	45	0.0	0.0
Lane 2	885	2.0	885	2.0	1187	0.746	100	9.4	LOS A	10.3 N4	73.4 N4	Full	45	0.0	50.0
Approach	1196	2.0	1196	2.0		0.746		9.4	LOS A	10.3	73.4				
West: S Parade															
Lane 1	290	2.0	290	2.0	1187	0.244	100	5.6	LOS A	3.8	27.2	Short	60	0.0	NA
Lane 2	211	2.0	211	2.0	864	0.244	100	5.6	LOS A	2.8	20.0	Full	500	-27.3 N3	0.0
Lane 3	211	2.0	211	2.0	864	0.244	100	5.6	LOS A	2.8	20.0	Short	60	-27.3 N3	NA
Approach	712	2.0	712	2.0		0.244		5.6	LOS A	3.8	27.2				
Intersection	2266	2.0	2266	2.0		0.746		12.2	LOS A	10.3	73.4				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

6 Lane under-utilisation due to downstream effects
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

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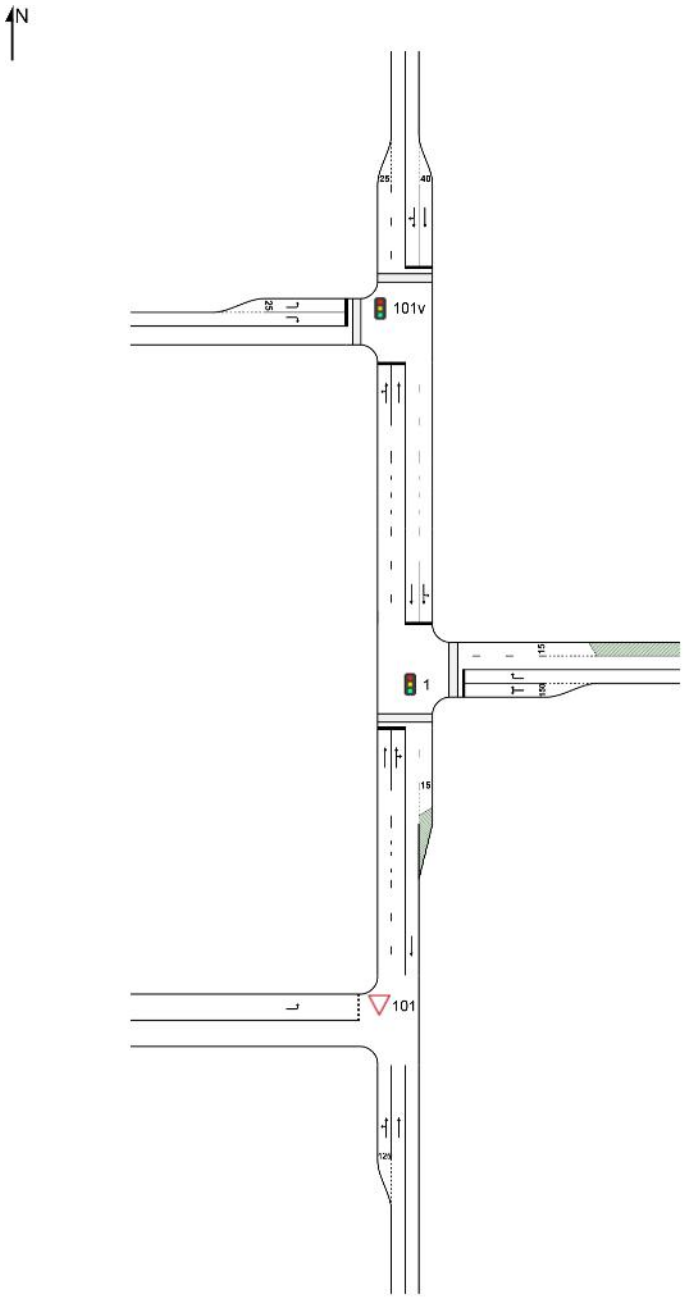
NETWORK LAYOUT

Network: N101 [2017 AM Future v2]

New Network



SITES IN NETWORK	
Site ID	**Site Name**
1	Mona Street / Clyde Street Future AM
101v	Clyde Redfern 2017 AM Future
101	Clyde Hudson AM Future

LANE SUMMARY

Site: 101 [Clyde Hudson AM Future]

Network: N101 [2017 AM Future v2]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde Street															
Lane 1	443	2.0	443	2.0	981	0.452	100	0.4	LOS A	10.0 N5	71.2 N5	Short	125	-48.9 N3	NA
Lane 2	435	2.0	435	2.0	962	0.452	100	0.1	LOS A	20.9 N5	148.7 N5	Full	500	-50.0 N3	0.0
Approach	878	2.0	878	2.0		0.452		0.3	NA	20.9	148.7				
North: Clyde Street															
Lane 1	423	2.0	423	2.0	1925	0.220	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	423	2.0	423	2.0		0.220		0.0	NA	0.0	0.0				
West: Hudson Street															
Lane 1	127	2.0	127	2.0	538	0.237	100	7.3	LOS A	0.5	3.4	Full	500	-50.0 N3	0.0
Approach	127	2.0	127	2.0		0.237		7.3	LOS A	0.5	3.4				
Intersection	1428	2.0	1428	2.0		0.452		0.8	NA	20.9	148.7				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.

LANE SUMMARY

Site: 101v [Clyde Redfern 2017 AM Future]

Network: N101 [2017 AM Future v2]

New Site
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time - User-Given)
Common Control Group: CCG1 [CCGName]

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde Street (South)															
Lane 1	262	2.0	262	2.0	1611	0.163	26[5]	4.4	LOS A	0.9	6.6	Full	50	0.0	0.0
Lane 2	662	2.0	662	2.0	1059	0.625	100	22.3	LOS B	11.5[N4]	81.6[N4]	Full	50	0.0	50.0
Approach	924	2.0	924	2.0		0.625		17.2	LOS B	11.5	81.6				
North: Clyde Street (North)															
Lane 1	292	2.0	292	2.0	529	0.552	100	15.9	LOS B	9.4	66.6	Short	40	-50.0[N3]	NA
Lane 2	370	2.0	370	2.0	670[1]	0.552	100	15.8	LOS B	11.1	78.9	Full	500	-8.2[N3]	0.0
Approach	662	2.0	662	2.0		0.552		15.9	LOS B	11.1	78.9				
West: Redfern Street															
Lane 1	13	2.0	13	2.0	604	0.021	100	29.5	LOS C	0.4	2.9	Short	25	0.0	NA
Lane 2	380	2.0	380	2.0	542[1]	0.701	100	37.4	LOS C	16.4	116.4	Full	500	-8.6[N3]	0.0
Approach	393	2.0	393	2.0		0.701		37.2	LOS C	16.4	116.4				
Intersection	1979	2.0	1979	2.0		0.701		20.7	LOS B	16.4	116.4				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

LANE SUMMARY

Site: 1 [Mona Street / Clyde Street Future AM]

Network: N101 [2017 AM Future v2]

Clyde St / Mona St
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network Cycle Time - User-Given)
Common Control Group: CCG1 [CCGName]

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Clyde St															
Lane 1	456	2.0	456	2.0	1059	0.431	57[5]	14.1	LOS A	4.1[N 4]	29.4[N4]	Full	18	0.0	50.0
Lane 2	531	2.0	531	2.0	702	0.756	100	33.7	LOS C	4.1[N 4]	29.4[N4]	Full	18	0.0	50.0
Approach	986	2.0	986	2.0		0.756		24.6	LOS B	4.1	29.4				
East: Mona St															
Lane 1	572	2.0	572	2.0	635	0.901	100	52.0	LOS D	32.5	231.7	Short	150	0.0	NA
Lane 2	272	2.0	272	2.0	302	0.901	100	62.7	LOS E	17.2	122.2	Full	500	-50.0[N3]	0.0
Approach	844	2.0	844	2.0		0.901		55.5	LOS D	32.5	231.7				
North: Clyde St															
Lane 1	864	2.0	864	2.0	1007	0.858	100	30.5	LOS C	11.5[N 4]	81.6[N4]	Full	50	0.0	50.0
Lane 2	158	2.0	158	2.0	308	0.513	60[5]	42.5	LOS D	7.3	52.0	Full	50	0.0	8.6
Approach	1022	2.0	1022	2.0		0.858		32.3	LOS C	11.5	81.6				
Intersection	2853	2.0	2853	2.0		0.901		36.5	LOS C	32.5	231.7				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

5 Lane under-utilisation found by the program
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

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LANE SUMMARY

Site: 101 [Clyde Hudson - PM Future]

Network: N101 [2017 PM Future v2]

New Site
Giveway / Yield (Two-Way)

Lane Use and Performance

	Demand Flows		Arrival Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Clyde Street															
Lane 1	309	2.0	309	2.0	1014	0.305	100	0.7	LOS A	25.9 N5	184.5 N5	Short	125	-47.0 N3	NA
Lane 2	293	2.0	293	2.0	962	0.305	100	0.1	LOS A	8.8 N5	62.9 N5	Full	500	-50.0 N3	0.0
Approach	602	2.0	602	2.0		0.305		0.4	NA	25.9	184.5				
North: Clyde Street															
Lane 1	637	2.0	637	2.0	1925	0.331	100	0.0	LOS A	0.0	0.0	Full	18	0.0	0.0
Approach	637	2.0	637	2.0		0.331		0.0	NA	0.0	0.0				
West: Hudson Street															
Lane 1	12	2.0	12	2.0	631	0.018	100	6.4	LOS A	0.0	0.3	Full	500	-50.0 N3	0.0
Approach	12	2.0	12	2.0		0.018		6.4	LOS A	0.0	0.3				
Intersection	1251	2.0	1251	2.0		0.331		0.2	NA	25.9	184.5				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Minor Road Approach LOS values are based on average delay for all lanes.
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 lanes.
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.

N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N5 Continuous Lane results determined by Back of Queue values of downstream lanes.

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LANE SUMMARY

Site: 101v [Clyde Redfern PM Future]

Network: N101 [2017 PM Future v2]

New Site
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Network Cycle Time - User-Given)
Common Control Group: CCG1 [Combined]

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Clyde Street (South)															
Lane 1	794	2.0	794	2.0	1007	0.789	100	27.7	LOS B	11.5[N4]	81.6[N4]	Full	50	0.0	50.0
Lane 2	460	2.0	460	2.0	1037	0.444	56[5]	3.8	LOS A	4.3	30.9	Full	50	0.0	0.0
Approach	1255	2.0	1255	2.0		0.789		18.9	LOS B	11.5	81.6				
North: Clyde Street (North)															
Lane 1	435	2.0	435	2.0	518	0.840	100	38.3	LOS C	27.3	194.3	Full	500	-50.0[N3]	0.0
Lane 2	293	2.0	293	2.0	349	0.840	100	54.7	LOS D	20.0	142.6	Full	500	-38.1[N3]	0.0
Approach	728	2.0	728	2.0		0.840		44.9	LOS D	27.3	194.3				
West: Redfern Street															
Lane 1	13	2.0	13	2.0	676	0.019	100	32.9	LOS C	0.5	3.5	Short	20	0.0	NA
Lane 2	358	2.0	358	2.0	399[1]	0.898	100	68.5	LOS E	26.9	191.2	Full	500	-40.1[N3]	0.0
Approach	371	2.0	371	2.0		0.898		67.2	LOS E	26.9	191.2				
Intersection	2354	2.0	2354	2.0		0.898		34.6	LOS C	27.3	194.3				

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

LANE SUMMARY

Site: 1 [Mona Street / Clyde Street PM Future]

Network: N101 [2017 PM Future v2]

Clyde St / Mona St
Signals - Fixed Time Coordinated Cycle Time = 130 seconds (Network Cycle Time - User-Given)
Common Control Group: CCG1 [Combined]

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Clyde St															
Lane 1	408	2.0	408	2.0	496	0.823	100	37.6	LOS C	4.1 N4	29.4 N4	Full	18	-50.0 N3	50.0
Lane 2	171	2.0	171	2.0	332	0.513	62 5	38.3	LOS C	4.1 N4	29.4 N4	Full	18	0.0	50.0
Approach	579	2.0	579	2.0		0.823		37.8	LOS C	4.1	29.4				
East: Mona St															
Lane 1	562	2.0	562	2.0	564	0.997	100	102.1	LOS F	54.1	385.3	Short (P)	150	-26.5 N3	NA
Lane 2	643	2.0	643	2.0	645 1	0.997	100	96.0	LOS F	57.3	407.9	Full	500	0.0	0.0
Approach	1205	2.0	1205	2.0		0.997		98.9	LOS F	57.3	407.9				
North: Clyde St															
Lane 1	779	2.0	779	2.0	1479	0.527	100	8.3	LOS A	11.5 N4	81.6 N4	Full	50	0.0	50.0
Lane 2	284	2.0	284	2.0	711	0.400	76 5	22.2	LOS B	10.0	71.2	Full	50	0.0	37.3
Approach	1063	2.0	1063	2.0		0.527		12.0	LOS A	11.5	81.6				
Intersection	2847	2.0	2847	2.0		0.997		54.0	LOS D	57.3	407.9				

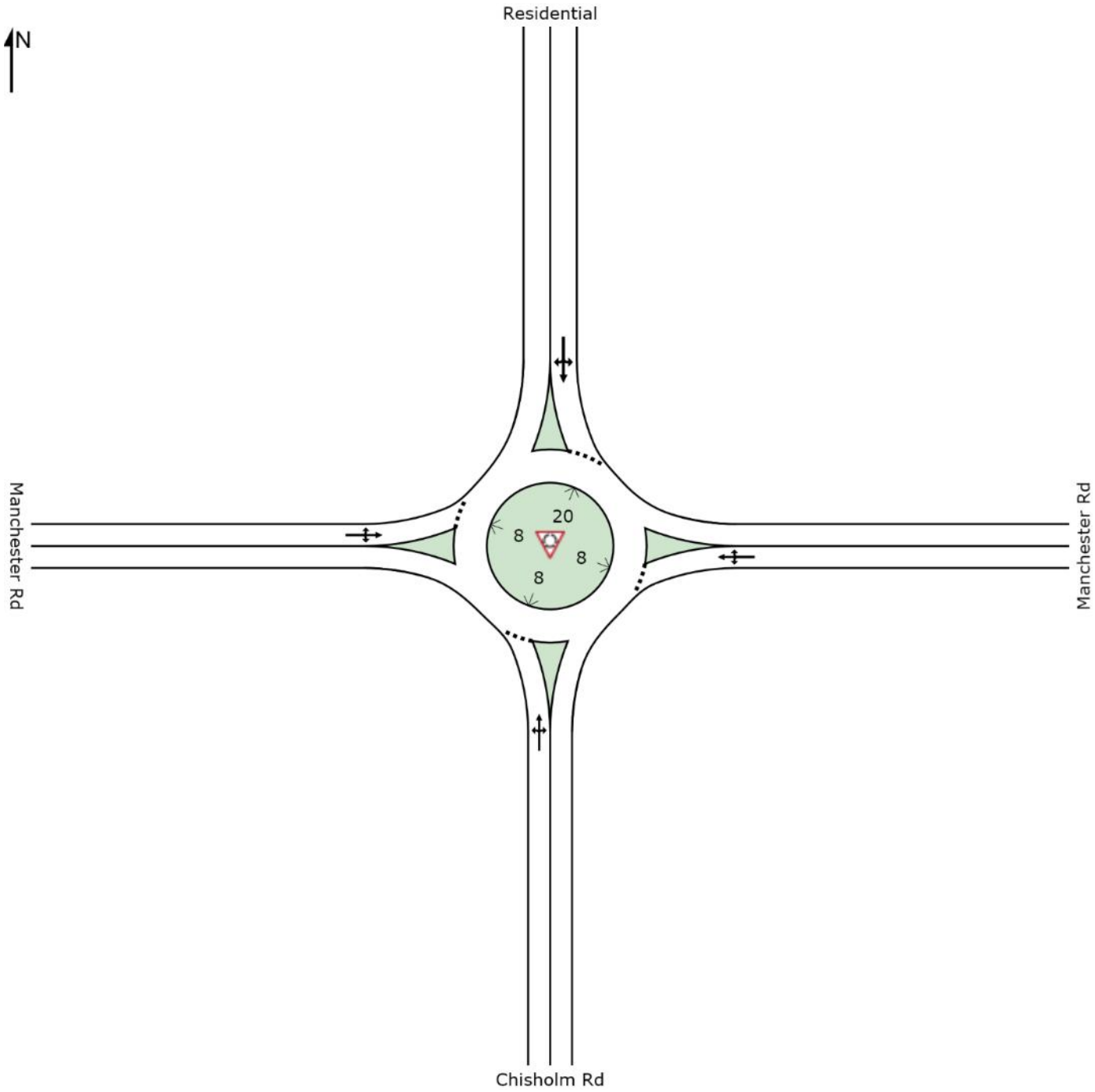
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
N3 Capacity Adjustment due to downstream lane blockage determined by the program.
N4 Average back of queue has been restricted to the available queue storage space.

SITE LAYOUT

Site: Payce - Manchester Rd / Chisholm Rd AM

Manchester Rd / Chisholm Rd
Roundabout



LANE SUMMARY

Site: Payce - Manchester Rd / Chisholm Rd AM

Manchester Rd / Chisholm Rd
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chisholm Rd													
Lane 1[d]	562	1.9	887	0.633	100	11.9	LOS A	6.9	49.1	Full	500	0.0	0.0
Approach	562	1.9		0.633		11.9	LOS A	6.9	49.1				
East: Manchester Rd													
Lane 1[d]	463	1.7	1188	0.390	100	5.4	LOS A	3.1	22.1	Full	500	0.0	0.0
Approach	463	1.7		0.390		5.4	LOS A	3.1	22.1				
North: Residential													
Lane 1[d]	303	0.0	888	0.342	100	7.2	LOS A	2.3	16.2	Full	500	0.0	0.0
Approach	303	0.0		0.342		7.2	LOS A	2.3	16.2				
West: Manchester Rd													
Lane 1[d]	145	2.0	802	0.181	100	4.4	LOS A	1.2	8.5	Full	500	0.0	0.0
Approach	145	2.0		0.181		4.4	LOS A	1.2	8.5				
Intersection	1474	1.5		0.633		8.2	LOS A	6.9	49.1				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

d Dominant lane on roundabout approach

LANE SUMMARY

Site: Payce - Manchester Rd / Chisholm Rd PM

Manchester Rd / Chisholm Rd
Roundabout

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chisholm Rd													
Lane 1[d]	336	1.5	953	0.352	100	8.4	LOS A	2.6	18.2	Full	500	0.0	0.0
Approach	336	1.5		0.352		8.4	LOS A	2.6	18.2				
East: Manchester Rd													
Lane 1[d]	437	1.1	1102	0.396	100	7.1	LOS A	3.2	22.8	Full	500	0.0	0.0
Approach	437	1.1		0.396		7.1	LOS A	3.2	22.8				
North: Residential													
Lane 1[d]	100	0.0	727	0.138	100	8.2	LOS A	0.9	6.1	Full	500	0.0	0.0
Approach	100	0.0		0.138		8.2	LOS A	0.9	6.1				
West: Manchester Rd													
Lane 1[d]	486	2.0	811	0.600	100	8.2	LOS A	6.0	43.0	Full	500	0.0	0.0
Approach	486	2.0		0.600		8.2	LOS A	6.0	43.0				
Intersection	1359	1.4		0.600		7.9	LOS A	6.0	43.0				

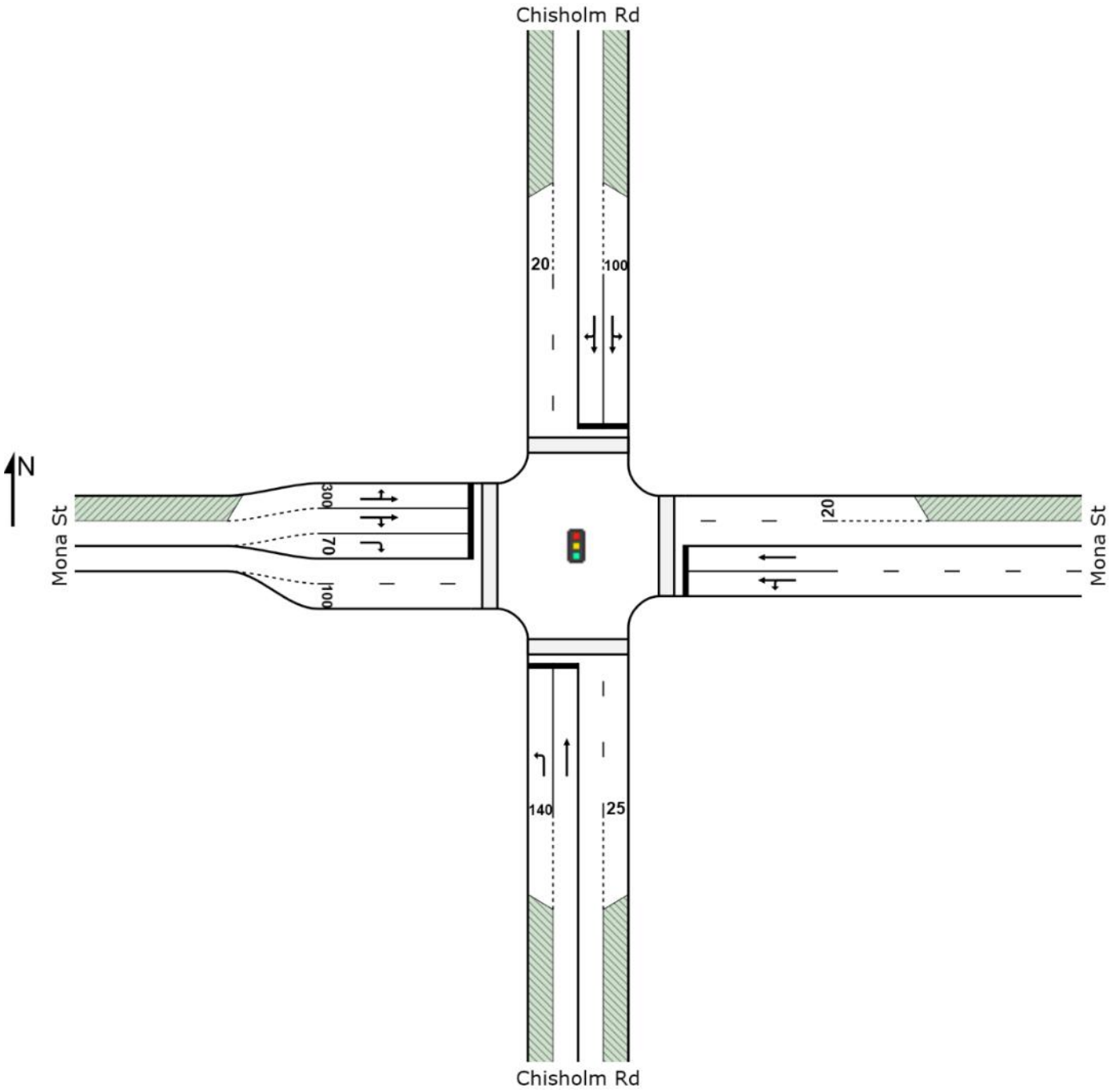
Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

SITE LAYOUT

Site: Payce - Mona Street / Chisholm Road AM

Mona Street / Chisholm Road
Signals - Fixed Time Isolated



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Organisation: JACOBS GROUP (AUSTRALIA) PTY LTD | Created: Thursday, 16 August 2018 1:43:30 PM
Project: \\Jacobs.com\ANZ\IE\Projects\04_Eastern\IA162400\06 Technical\Sidra Modelling\2018-6-22 Payce Scenario\Intersections Mona Street Upgrade_Payce Scenario v3.sip6

LANE SUMMARY

Site: Payce - Mona Street / Chisholm Road AM

Mona Street / Chisholm Road
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chisholm Rd													
Lane 1	395	2.8	1303	0.303	100	11.6	LOS A	8.9	63.6	Short (P)	140	0.0	NA
Lane 2	127	2.8	545	0.234	100	38.1	LOS C	6.1	44.1	Full	500	0.0	0.0
Approach	522	2.8		0.303		18.1	LOS B	8.9	63.6				
East: Mona St													
Lane 1	115	2.8	367	0.313	56[6]	49.2	LOS D	6.3	45.1	Full	500	0.0	0.0
Lane 2	207	2.8	368	0.563	100	51.7	LOS D	12.0	86.3	Full	500	0.0	0.0
Approach	322	2.8		0.563		50.8	LOS D	12.0	86.3				
North: Chisholm Rd													
Lane 1	92	2.8	545	0.168	21[5]	37.3	LOS C	4.3	31.0	Short (P)	100	0.0	NA
Lane 2	179	2.8	223	0.802	100	64.4	LOS E	12.2	87.1	Full	500	0.0	0.0
Approach	271	2.8		0.802		55.2	LOS D	12.2	87.1				
West: Mona St													
Lane 1	928	2.8	1162	0.799	100	21.8	LOS B	43.4	311.3	Short (P)	300	0.0	NA
Lane 2	231	2.8	1193	0.193	24[5]	11.0	LOS A	6.1	43.8	Full	500	0.0	0.0
Lane 3	383	2.8	831	0.461	58[5]	29.5	LOS C	14.9	107.1	Short	70	0.0	NA
Approach	1542	2.8		0.799		22.1	LOS B	43.4	311.3				
Intersection	2657	2.8		0.802		28.2	LOS B	43.4	311.3				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

LANE SUMMARY

Site: Payce - Mona Street / Chisholm Road PM

Mona Street / Chisholm Road
Signals - Fixed Time Isolated Cycle Time = 130 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chisholm Rd													
Lane 1	519	2.8	1149	0.452	100	17.7	LOS B	16.7	119.4	Short (P)	140	0.0	NA
Lane 2	128	2.8	913	0.141	100	20.1	LOS B	4.5	32.0	Full	500	0.0	0.0
Approach	647	2.8		0.452		18.1	LOS B	16.7	119.4				
East: Mona St													
Lane 1	245	2.8	529	0.463	56[6]	42.1	LOS C	12.9	92.3	Full	500	0.0	0.0
Lane 2	442	2.8	530	0.834	100	52.8	LOS D	28.3	203.1	Full	500	0.0	0.0
Approach	687	2.8		0.834		49.0	LOS D	28.3	203.1				
North: Chisholm Rd													
Lane 1	93	2.8	912	0.102	12[5]	19.8	LOS B	3.2	22.6	Short (P)	100	0.0	NA
Lane 2	273	2.8	331	0.825	100	52.0	LOS D	18.2	130.5	Full	500	0.0	0.0
Approach	365	2.8		0.825		43.8	LOS D	18.2	130.5				
West: Mona St													
Lane 1	606	2.8	807	0.751	95[6]	35.1	LOS C	32.0	229.5	Short	300	0.0	NA
Lane 2	36	2.8	200	0.181	23[6]	61.3	LOS E	2.1	15.3	Full	500	0.0	0.0
Lane 3	156	2.8	196	0.794	100	71.5	LOS F	10.4	74.8	Short	70	0.0	NA
Approach	798	2.8		0.794		43.4	LOS D	32.0	229.5				
Intersection	2498	2.8		0.834		38.5	LOS C	32.0	229.5				

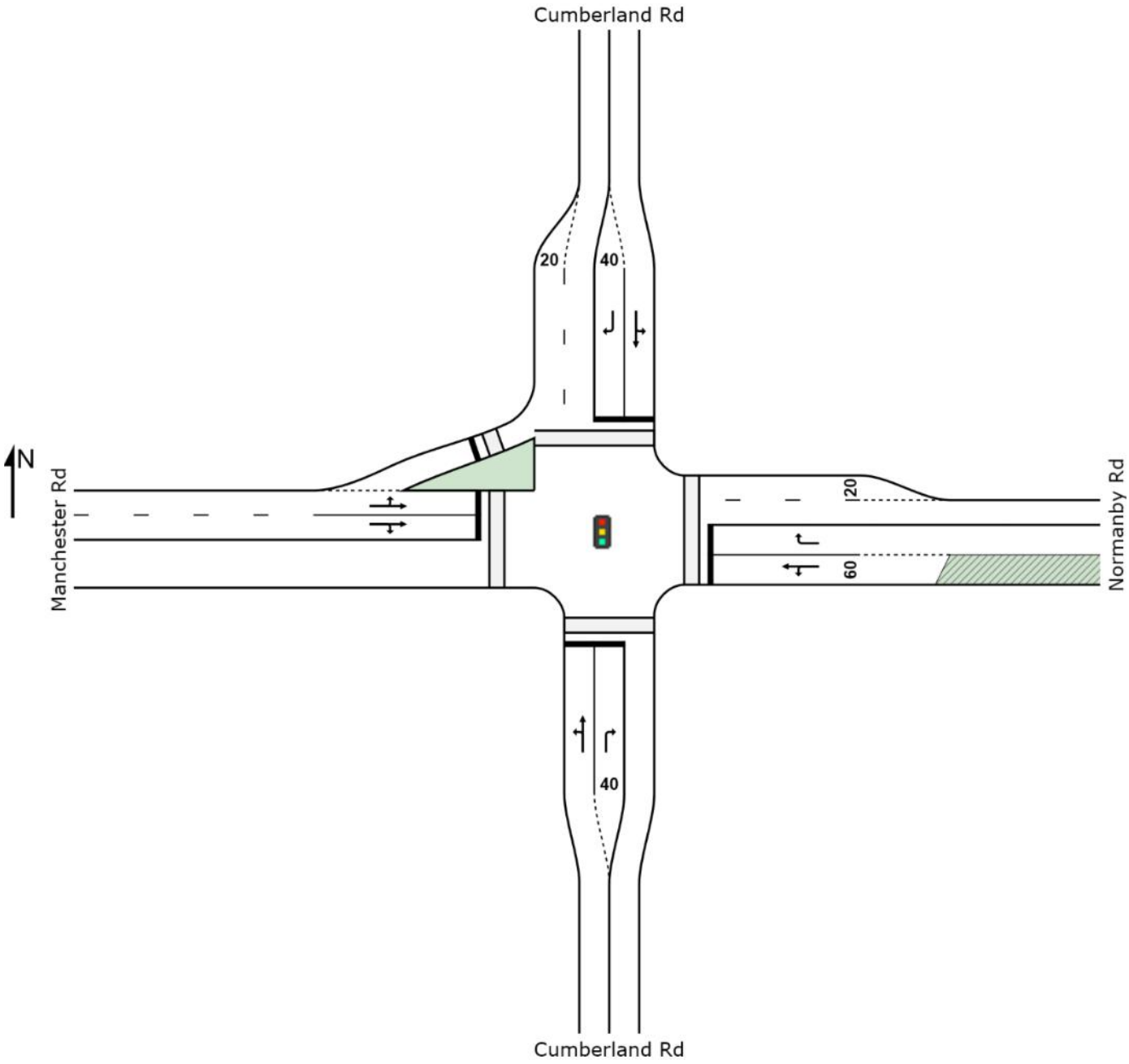
Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

SITE LAYOUT

Site: Payce - Manchester Road / Cumberland Road AM

Cumberland Rd / Manchester Rd / The Crescent / Normanby Rd
Signals - Fixed Time Isolated



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Project: \\Jacobs.com\ANZ\IE\Projects\04_Eastern\IA162400\06 Technical\Sidra Modelling\2018-6-22 Payce Scenario\Intersections Mona Street Upgrade_Payce Scenario v3.sip6

LANE SUMMARY

Site: Payce - Manchester Road / Cumberland Road AM

Cumberland Rd / Manchester Rd / The Crescent / Normanby Rd
Signals - Fixed Time Isolated Cycle Time = 120 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Cumberland Rd													
Lane 1	624	2.0	825[1]	0.757	100	23.2	LOS B	25.9	184.7	Full	500	0.0	0.0
Lane 2	162	2.0	600	0.270	100	17.2	LOS B	4.2	29.9	Short	40	0.0	NA
Approach	786	2.0		0.757		22.0	LOS B	25.9	184.7				
East: Normanby Rd													
Lane 1	71	0.0	308	0.229	100	51.4	LOS D	3.6	25.4	Short (P)	60	0.0	NA
Lane 2	3	0.0	145	0.022	100	60.0	LOS E	0.2	1.2	Full	500	0.0	0.0
Approach	74	0.0		0.229		51.8	LOS D	3.6	25.4				
North: Cumberland Rd													
Lane 1	318	2.0	1345	0.236	100	8.1	LOS A	7.0	50.0	Full	500	0.0	0.0
Lane 2	395	2.0	564[1]	0.700	100	25.7	LOS B	16.1	114.7	Short	40	0.0	NA
Approach	713	2.0		0.700		17.8	LOS B	16.1	114.7				
West: Manchester Rd													
Lane 1	517	2.0	980	0.527	87[5]	14.5	LOS B	16.3	115.7	Full	500	0.0	0.0
Lane 2	114	2.0	187	0.609	100	59.3	LOS E	6.6	47.2	Full	500	0.0	0.0
Approach	631	2.0		0.609		22.6	LOS B	16.3	115.7				
Intersection	2203	1.9		0.757		21.8	LOS B	25.9	184.7				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program

LANE SUMMARY

Site: Payce - Manchester Road / Cumberland Road PM

Cumberland Rd / Manchester Rd / The Crescent / Normanby Rd
Signals - Fixed Time Isolated Cycle Time = 80 seconds (User-Given Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Cumberland Rd													
Lane 1	334	2.0	953	0.350	100	14.1	LOS A	7.9	56.0	Full	500	0.0	0.0
Lane 2	100	2.0	353	0.283	100	26.5	LOS B	2.9	20.7	Short	40	0.0	NA
Approach	434	2.0		0.350		16.9	LOS B	7.9	56.0				
East: Normanby Rd													
Lane 1	99	2.0	671	0.147	100	23.6	LOS B	2.6	18.9	Short (P)	60	0.0	NA
Lane 2	4	2.0	511	0.008	100	23.7	LOS B	0.1	0.8	Full	500	0.0	0.0
Approach	103	2.0		0.147		23.6	LOS B	2.6	18.9				
North: Cumberland Rd													
Lane 1	463	2.0	723[1]	0.641	100	14.1	LOS A	11.7	83.6	Full	500	0.0	0.0
Lane 2	325	2.0	393[1]	0.827	100	37.9	LOS C	13.5	96.0	Short	40	0.0	NA
Approach	788	2.0		0.827		23.9	LOS B	13.5	96.0				
West: Manchester Rd													
Lane 1	595	2.0	689	0.863	100	36.2	LOS C	25.8	183.5	Full	500	0.0	0.0
Approach	595	2.0		0.863		36.2	LOS C	25.8	183.5				
Intersection	1920	2.0		0.863		26.1	LOS B	25.8	183.5				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.

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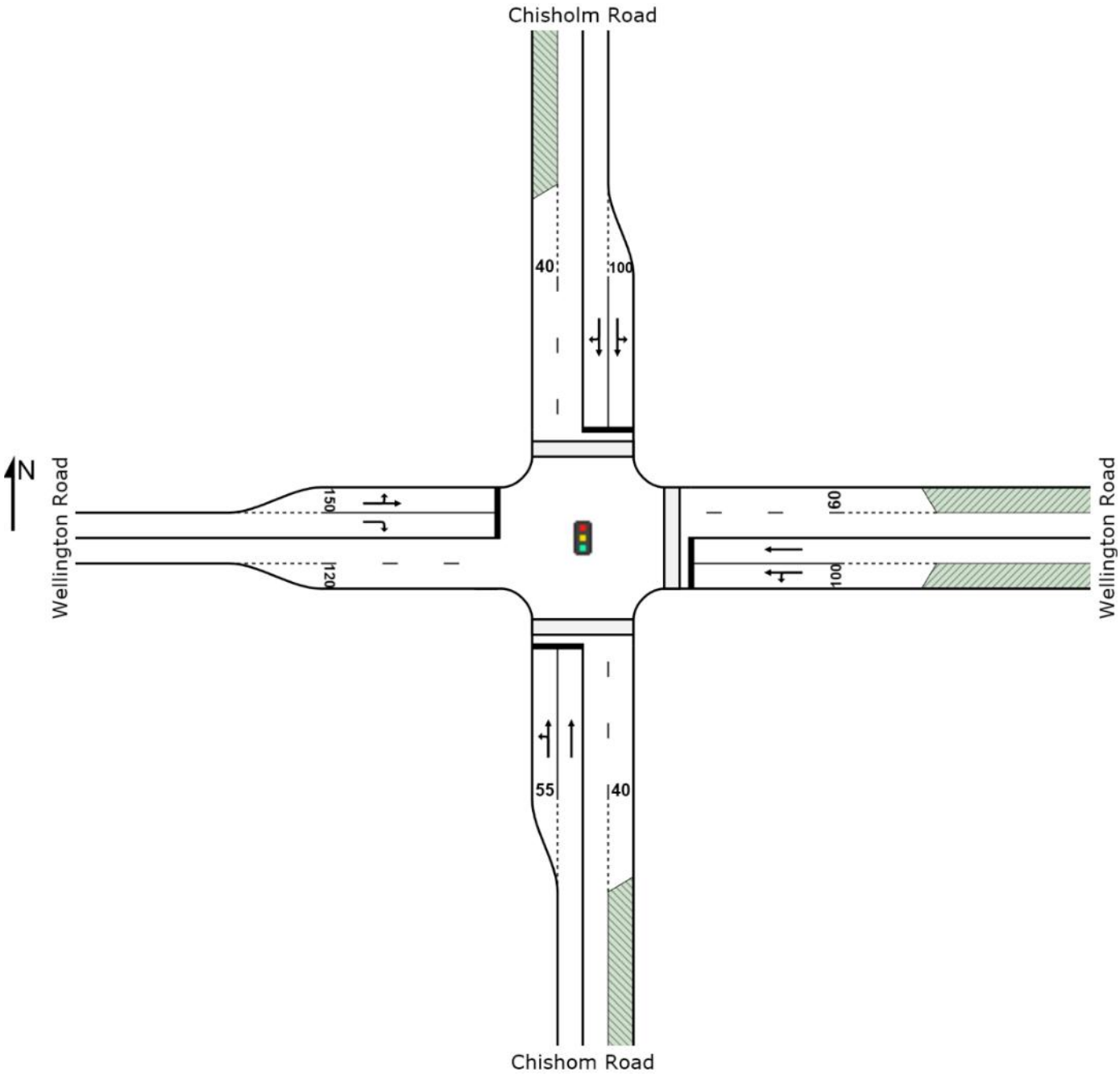
SITE LAYOUT

Site: Chisholm Road / Wellington Road 2018 AM

New Site
Signals - Fixed Time Isolated



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Project: \\Jacobs.com\ANZ\IE\Projects\04_Eastern\IA162400\06 Technical\Sidra Modelling\2018-6-22 Payce Scenario\Intersections Mona Street Upgrade_Payce Scenario v3.sip6

LANE SUMMARY

Site: Chisholm Road / Wellington Road 2018 AM

New Site
Signals - Fixed Time Isolated Cycle Time = 70 seconds (Practical Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chishom Road													
Lane 1	175	2.0	445	0.393	100	30.1	LOS C	5.1	36.6	Short	55	0.0	NA
Lane 2	168	2.0	467	0.360	92[5]	24.3	LOS B	4.9	34.9	Full	500	0.0	0.0
Approach	343	2.0		0.393		27.3	LOS B	5.1	36.6				
East: Wellington Road													
Lane 1	237	2.0	1123	0.211	66[6]	7.7	LOS A	3.8	27.0	Short (P)	100	0.0	NA
Lane 2	362	2.0	1127	0.321	100	7.9	LOS A	6.3	44.8	Full	500	0.0	0.0
Approach	599	2.0		0.321		7.9	LOS A	6.3	44.8				
North: Chisholm Road													
Lane 1	225	2.0	465	0.485	53[5]	25.8	LOS B	6.8	48.4	Short	100	0.0	NA
Lane 2	212	2.0	229	0.922	100	55.2	LOS D	9.7	69.3	Full	500	0.0	0.0
Approach	437	2.0		0.922		40.1	LOS C	9.7	69.3				
West: Wellington Road													
Lane 1	980	2.0	1113	0.881	100	24.8	LOS B	36.4	259.0	Short	150	0.0	NA
Lane 2	195	2.0	433	0.450	100	18.2	LOS B	4.5	31.8	Full	500	0.0	0.0
Approach	1175	2.0		0.881		23.7	LOS B	36.4	259.0				
Intersection	2554	2.0		0.922		23.3	LOS B	36.4	259.0				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

LANE SUMMARY

Site: Chisholm Road / Wellington Road 2018 PM

New Site
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Practical Cycle Time)

Lane Use and Performance

	Demand Flows Total veh/h	HV %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Average Delay sec	Level of Service	95% Back of Queue Veh	Dist m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Chishom Road													
Lane 1	296	2.0	308[1]	0.959	100	86.5	LOS F	22.3	158.6	Short (P)	55	0.0	NA
Lane 2	205	2.0	367	0.559	58[5]	48.4	LOS D	11.0	78.6	Full	500	0.0	0.0
Approach	501	2.0		0.959		70.9	LOS F	22.3	158.6				
East: Wellington Road													
Lane 1	290	2.0	993	0.292	66[6]	17.6	LOS B	9.5	67.7	Short (P)	60	0.0	NA
Lane 2	427	2.0	958[1]	0.445	100	19.1	LOS B	15.3	108.7	Full	500	0.0	0.0
Approach	717	2.0		0.445		18.5	LOS B	15.3	108.7				
North: Chisholm Road													
Lane 1	145	2.0	271	0.536	56[5]	53.4	LOS D	8.1	57.6	Short (P)	40	0.0	NA
Lane 2	217	2.0	228[1]	0.952	100	86.1	LOS F	15.9	113.5	Full	500	0.0	0.0
Approach	362	2.0		0.952		73.0	LOS F	15.9	113.5				
West: Wellington Road													
Lane 1	354	2.0	1020	0.347	37[6]	19.6	LOS B	11.3	80.8	Short	150	0.0	NA
Lane 2	582	2.0	617	0.942	100	65.6	LOS E	44.0	313.6	Full	500	0.0	0.0
Approach	936	2.0		0.942		48.2	LOS D	44.0	313.6				
Intersection	2516	2.0		0.959		47.8	LOS D	44.0	313.6				

Level of Service (LOS) Method: Delay (RTA NSW).
Lane LOS values are based on average delay per lane.
Intersection and Approach LOS values are based on average delay for all lanes.
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.

1 Reduced capacity due to a short lane effect. Short lane queues may extend into the adjacent full-length lanes. Some upstream delays at entry to short lanes are not included.
5 Lane under-utilisation found by the program
6 Lane under-utilisation due to downstream effects

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