Hawkesbury City Council

Attachment 1 to item189

Hawkesbury Traffic Modelling Report

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Traffic Modelling Report

Hawkesbury Traffic Study – Stage 2

Prepared for Hawkesbury City Council
24 October 2019

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1 Introduction

1.1 Background

SMEC has been commissioned by Hawkesbury City Council (Council) to undertake a traffic study to assist in planning for the transport and traffic needs of the Hawkesbury community, as well as cross regional requirements. The study also enables the impact of proposed development and growth to be assessed and any required improvements or capacity needs to be determined.

The project was divided into two stages. Stage 1 of the study, which was completed in June 2018, involved the collection of existing data and review of previous reports relevant to the study, undertaking a gap analysis detailing additional information required to progress the study, preliminary assessment of bridge crossings and the associated intersections in accordance with the brief, as well as preparation and delivery of the Stage 1 study report.

Stage 2 of the study involved developing a mesoscopic model using Aimsun software to include the key road network within the Hawkesbury City Council Local Government Area (LGA). The Aimsun traffic model was developed for the 2018 AM and PM peak periods and was calibrated and validated in early 2019. In this regard, a separate calibration and validation report was submitted to Council in early 2019. The purpose of the model and traffic report is discussed in Section 1.3.

1.2 Study Area

The Hawkesbury City Council LGA is located on the north-western fringe of the Sydney Metropolitan Area. The LGA is transected, in part, by the Bells Line of Road route, which serves as one of only two roads from the Sydney basin to western NSW and is connected to the south by The Northern Road, Londonderry Road and Castlereagh Road. To the east, Windsor Road and Richmond/ Blacktown Road provide connections to the Metropolitan area and its motorway network, whilst to the north Putty Road provides a connection to the Hunter Region.

The LGA is divided by the Hawkesbury River, which currently only has two principal bridge crossings, one at Windsor and one at North Richmond, supplemented by a low-level bridge at Yarramundi.

The extent of the LGA included in the mesoscopic traffic model was identified in consultation with Council and includes the whole of the LGA to the east, west and south, whilst to the north the model extends a short distance north of the Colo River crossing on Putty Road.

1.3 Purpose of this Report

The purpose of this report is to assess future year development and infrastructure scenarios agreed with Council and to report on relevant road network impacts utilising the mesoscopic model developed. The future year scenarios assessed are as follows:

- 2027 future year base case. This includes committed development and future infrastructure upgrades agreed with Council, including the new Grose River Bridge at Navua Reserve
- Scenario 1 – Impact on the road network without the Grose River Bridge in 2027
- Scenario 2 – Impact of the proposed Kurmond and Kurrajong Investigation Area in 2027
- Scenario 3 – Impact of 5% uplift in trips in the Richmond and Windsor town centre areas in 2027.

Details of each of the above referred future year scenarios is further discussed in Section 2 of this report.

The assessment carried out for the above scenarios is of a high-level nature due to the nature of mesoscopic model outputs. The purpose of the assessment is to identify potential areas of concern and to understand impacts associated with the above noted scenarios on the road network, which, if required, could be studied in more detail at a microscopic level.

2 Future Year Assessment Scenarios

2.1 Introduction

As discussed, the purpose of developing the Aimsun mesoscopic model in Stage 2 of the study is to assess the impact of proposed future development and road network infrastructure upgrades. Following discussion with Council, it was agreed to assess four future year scenarios, including the future base year, as well as three future year scenarios involving potential future development and road network infrastructure upgrades.

Key assumptions and modifications adopted in the traffic model for purposes of assessment relating to each of the future year scenarios are discussed in the following section.

It should be noted that the future year scenarios analysed in this study along with the assumptions adopted were based on the current network conditions and information available at time of study preparation. SMEC are aware of strategic land use planning being undertaken by Hawkesbury City Council and adjoining councils external to the model area, which may trigger the need to revisit assumptions including trip patterns and trip tables in the future. In this regard, further analysis may be required at a future time to update the model where significant changes to either the road network or trip patterns occur or are identified as warranting adjustment to the model.

2.2 Future Year Scenarios

2.2.1 2027 Future Year Base Case

In order to assess the 2027 future year base case, several adjustments were required to the model and input data.

2.2.1.1 Road Network Adjustments

It was agreed with Council that the following infrastructure upgrades are to be included in the future year base case. These projects are either in the construction stage, have recently been completed, or are deemed to be committed projects that will be completed by 2027.

- Intersection upgrades along the Bells Line of Road corridor in Richmond and North Richmond. These include completed upgrades at the following intersections:
  - Bells Line of Road / Grose Vale Road/ Terrace Road
  - Bells Line of Road/ Yarramundi Lane/ Old Kurrajong Road
  - March Street/ Chapel Street
  - March Street/ Bosworth Street
- Bridge and intersection upgrades along Bridge Street in Windsor, including:
  - Converting the existing roundabout at Bridge Street/ George Street to a signalised intersection and removing the northbound right turn movement from Bridge Street into George Street
  - Realigning the intersections north of the Windsor bridge to form a roundabout at the intersection of Bridge Street/ Wilberforce Road/ Freemans Reach Road/ Macquarie Park Access
  - Replacement of the existing Windsor Bridge with a new bridge providing additional capacity in the southbound direction from one traffic lane to two traffic lanes
  - Reduction of the speed limit from 60 kph to 50 kph on Bridge Street within the upgrade area
- Upgrade of the intersection of Boundary Road/ Windsor Road
- A new Grose River Bridge at Navua and Yarramundi Reserves connecting the Grose River Road on the north side of the Grose River to Springwood Road on the south side of the Grose River, including construction of a priority intersection at Springwood Road to link Grose River Road with the road network south of the Grose River.

2.2.1.2 Future Development

In addition to the above noted road network infrastructure upgrades, it was agreed with Council to include the following land use developments in the future year base case:

- Redbank development – remaining 1,250 residential dwellings and 80 retirement village dwellings
- Glossodia development – 250 residential dwellings
- Vineyard development – 900 residential dwellings
- Pitt Town development – 150 residential dwellings.

Figure 2-1 shows the location of road network upgrades, as well as land use developments assumed in the future year base case model.

Figure 2-1 Location of road infrastructure upgrades and proposed land use developments assumed in the future base case model

2.2.1.3 Trip Generation and Distribution of Committed Development Traffic

Due to the addition of committed development, adjustments to the model demand trip tables were required to include the estimated newly generated trips on the future road network. The demand trip tables were adjusted to accommodate the following:

- Organic background traffic growth which was obtained from the Sydney Strategic Transport Forecasting Model (STFM). It should be noted that the STFM was not locally recalibrated for the study area, as mentioned in the Stage 1 report. Due to the lack of other available data, the STFM is considered the best tool to provide an indication of background future traffic growth
- Additional trips generated as a result of proposed committed land use developments.

It was agreed with Council that the following trip rates should be adopted for committed land use developments:

- 0.85 vph/dwelling during both the AM and PM peak hours for residential dwellings
- 0.4 vph/dwelling during both the AM and PM peak hours for retirement village dwellings.

It is noted that the revised *RMS Guide to Traffic Generating Developments Technical Direction 2013/04a (GTTGD TDT 2013/04a)* published in August 2013 suggested average trip rates of 0.71 vph/dwelling and 0.78 vph/dwelling for low density residential dwellings in the regional areas during the morning and evening peak hours respectively. However, the trip rate of 0.85 vph/dwelling adopted for the Hawkesbury mesoscopic model is within the range of trip rates suggested by RMS and provides a robust assessment of impacts.

The trip rate adopted for the retirement village dwellings is in accordance with *RMS GTTGD TDT 2013/04a*.

The Hawkesbury mesoscopic traffic model was created with a 3-hour trip demand during each peak period, supplemented with an additional 30-minute warm-up demand. It was anticipated that committed development traffic would not generate the maximum number of trips during the whole 3.5 hours. As such, apart from the peak hour within each peak period, other hours within the peak period would experience lower trip rates. The lower trip rates were determined based on the following methodology:

- The trip distribution and traffic profile patterns for each committed development were based on a nearby existing zone within the model. The existing zone was selected based on its proximity, as well as its land use similarity to the committed land use development

- The traffic profile for each committed development during each hour within the assessed peak period was determined based on the profile of the selected existing zone. The percentage of traffic demand for each hour compared to the peak hour within the peak period was calculated and was later applied to the trip rates agreed for each land use to obtain the lower trip rates for the corresponding hour.

It was assumed that all the trips generated by committed land use developments would have either destinations or origins external to the development, except for the residential dwellings and retirement village dwellings associated with the Redbank development. As the development covers a substantial area with a high number of dwellings and likely local amenities within the development, it was agreed with Council that 5% of the trips generated would remain internal to the development.

A directional split of 20% inbound trips and 80% outbound trips was assumed and agreed with Council for all committed development during the AM peak. A reverse split of 80% inbound trips and 20% outbound trips was adopted for the PM peak.

The trip rates adopted and relevant assumptions are provided in Table 2-1 and Table 2-2 below for the AM and PM peak periods respectively.

Table 2-1 Committed Development Trip Generation Rates and Assumptions – AM Peak

Development	Time Period	Trip Rate (vph/dwelling)	Internal Trips (%)	Directional Split (%)
				IN : OUT
Redbank Residential	0530 – 0600	0.21	5%	20 : 80
	0600 – 0700	0.70	5%	20 : 80
	0700 – 0800	0.66	5%	20 : 80
	0800 – 0900	0.85	5%	20 : 80
Redbank Retirement Village	0530 – 0600	0.10	5%	20 : 80
	0600 – 0700	0.33	5%	20 : 80
	0700 – 0800	0.31	5%	20 : 80
	0800 – 0900	0.40	5%	20 : 80
Glossodia	0530 – 0600	0.21	0%	20 : 80
	0600 – 0700	0.70	0%	20 : 80
	0700 – 0800	0.66	0%	20 : 80
	0800 – 0900	0.85	0%	20 : 80
Vineyard	0530 – 0600	0.25	0%	20 : 80
	0600 – 0700	0.85	0%	20 : 80
	0700 – 0800	0.73	0%	20 : 80
	0800 – 0900	0.81	0%	20 : 80
Pitt Town	0530 – 0600	0.19	0%	20 : 80
	0600 – 0700	0.64	0%	20 : 80
	0700 – 0800	0.85	0%	20 : 80
	0800 – 0900	0.54	0%	20 : 80

Table 2-2 Committed Development Trip Generation Rates and Assumptions – PM Peak

Development	Time Period	Trip Rate (vph/dwelling)	Internal Trips (%)	Directional Split (%)
				IN : OUT
Redbank Residential	1430 – 1500	0.26	5%	80 : 20
	1500 – 1600	0.85	5%	80 : 20
	1600 – 1700	0.69	5%	80 : 20
	1700 – 1800	0.67	5%	80 : 20
Redbank Retirement Village	1430 – 1500	0.12	5%	80 : 20
	1500 – 1600	0.40	5%	80 : 20
	1600 – 1700	0.32	5%	80 : 20
	1700 – 1800	0.32	5%	80 : 20
Glossodia	1430 – 1500	0.26	0%	80 : 20
	1500 – 1600	0.85	0%	80 : 20
	1600 – 1700	0.69	0%	80 : 20
	1700 – 1800	0.67	0%	80 : 20
Vineyard	1430 – 1500	0.25	0%	80 : 20
	1500 – 1600	0.85	0%	80 : 20
	1600 – 1700	0.79	0%	80 : 20
	1700 – 1800	0.66	0%	80 : 20
Pitt Town	1430 – 1500	0.25	0%	80 : 20
	1500 – 1600	0.83	0%	80 : 20
	1600 – 1700	0.85	0%	80 : 20
	1700 – 1800	0.79	0%	80 : 20

2.2.1.4 Other Adjustments

Optimisation of several signalised intersections was carried out, where necessary, particularly at intersections adjacent to the Richmond and Windsor bridges in order to ensure that capacity of the network is maximised.

2.2.2 Scenario 1 – Impact on road network without the Grose River Bridge

For Scenario 1, all model modifications and assumptions adopted for the future base case described above were included, except for the new Grose River Bridge at Navua Reserve. This scenario was developed to assess the impact on the surrounding road network in the event that the bridge was not completed in 2027, particularly impacts from the proposed Redbank development on key intersections in the North Richmond area, including the existing Richmond Bridge. The location of the proposed Grose River Bridge, which was removed from the road network, is shown in Figure 2-2 below.

Figure 2-2 Location of the Grose River Bridge which was removed from the road network in Scenario 1

2.2.1 Scenario 2 – Impact of the Kurmond and Kurrajong Investigation Area

Scenario 2 was developed to evaluate the impact of proposed future development associated with the Kurmond and Kurrajong Investigation Area. The approximate location of the investigation area is shown in Figure 2-3. Trips generated by proposed development in the investigation area are in addition to background traffic growth and trips generated by committed development, which are included in the future base case.

Figure 2-3 Location of the Kurmond and Kurrajong Investigation Area assumed in Scenario 2

2.2.1.1 Proposed Future Development

Future development at the Kurmond and Kurrajong Investigation Area would include 200 residential dwellings. Similar to the future base case, a trip rate of 0.85 vph/dwelling was used to estimate the total number of trips that would be generated by proposed development in the investigation area.

It is understood that the proposed development would be separated by the Bells Line of Road into northern and southern development areas. This is reflected in network coding as part of model adjustments for the scenario, with the assumption that the northern area would consist of 50 dwellings and the southern area would consist of 150 dwellings, as agreed with Council.

2.2.1.2 Trip Generation and Distribution

The method for estimating the number of trips generated by the Kurmond and Kurrajong Investigation Area is similar to the estimation method utilised for committed development in the future base case. The traffic profile from an adjacent selected existing zone was utilised as the base for estimating the trip rates for hours other than the peak hour of each peak periods.

Table 2-3 and Table 2-4 list the AM and PM trip rates adopted for each hour within the peak periods. No internal trips were assumed for the development. The same directional splits as the future base case were adopted with the IN : OUT ratio being 20% : 80% in the morning and 80% : 20% in the evening.

The trip distribution pattern adopted for the Kurmond and Kurrajong Area is based on the same existing zone utilised for the trip estimation.

Table 2-3 Kurmond and Kurrajong Area Trip Generation Rates and Assumptions – AM Peak

Development	Time Period	Trip Rate (vph/dwelling)	Internal Trips (%)	Directional Split (%)
				IN : OUT
Kurmond and Kurrajong Investigation Area	0530 – 0600	0.21	0%	20 : 80
	0600 – 0700	0.70	0%	20 : 80
	0700 – 0800	0.66	0%	20 : 80
	0800 – 0900	0.85	0%	20 : 80

Table 2-4 Kurmond and Kurrajong Area Trip Generation Rates and Assumptions – PM Peak

Development	Time Period	Trip Rate (vph/dwelling)	Internal Trips (%)	Directional Split (%)
				IN : OUT
Kurmond and Kurrajong Investigation Area	1430 – 1500	0.26	0%	80 : 20
	1500 – 1600	0.85	0%	80 : 20
	1600 – 1700	0.69	0%	80 : 20
	1700 – 1800	0.67	0%	80 : 20

2.2.2 Scenario 3 – Impact of 5% uplift in trips in the Richmond and Windsor town centre areas

It is understood that Council is undertaking studies relating to the revitalisation of both the Richmond and Windsor town centres. Revitalisation of both town centres would indicate potential densification and growth in both areas. As a result, trips to and from the town centres would likely increase and the surrounding road network would be required to accommodate the growth in traffic demand.

Scenario 3 was developed to assist Council assess the potential impact on the road network of the revitalisation program. As planning of the revitalisation is still in its infancy, details of potential growth areas within the town centres are uncertain at this stage. It was agreed with Council that a 'broad-brush' 5% increase in traffic demand should be applied to trips originating and attracted to both town centres (refer Figure 2-4). This would provide a high-level assessment of potential issues relating to the road network, which could then be studied in greater detail in future, if required.

Figure 2-4 5% uplift in trips in Richmond and Windsor town centre areas assumed in Scenario 3

3 Future Year Scenario Traffic Model Outputs

To assess the impact of future year scenarios on the road network, a number of different network performance measures were considered as part of the impact evaluation.

As the Hawkesbury road network includes a high number of rural roads with low traffic volumes, it was considered that reporting average network results would dilute potential issues in localised areas. It was therefore considered more relevant to report area-based statistics. The following sections provide results separated into the Richmond and Windsor areas to provide a more meaningful evaluation of the impact for each scenario.

Figure 3-1 illustrates the cordons adopted for each investigation area. The Richmond investigation area includes both the Richmond Town Centre, as well as the suburb of North Richmond. The Windsor investigation area consists of Windsor Town Centre, as well as the suburb of South Windsor.

Figure 3-1 Richmond and Windsor investigation area cordons

The following sections discuss the impact of each future year scenario on the road network. Key network performance parameters adopted for discussion purposes include Vehicle Hours Travelled (VHT) and traffic flow density. Intersection performance has also been considered at locations agreed with Council.

Each performance parameter is discussed in the following sections followed by the results obtained for each scenario for the relevant parameter. As a number of network performance parameters have been used to provide a better understanding of impacts on the road network, results relating to all performance parameters for each scenario are discussed in Section 4 in order to allow a comprehensive understanding of findings to be provided.

The 2027 Base Case is compared against the 2018 Base Case, while the three future year assessment scenarios are compared against the 2027 future year base case.

3.1 Network Performance

3.1.1 Vehicle Hours Travelled (VHT)

VHT provides an overview of the time required for all vehicles to travel to, from, through and within the cordoned areas during the peak periods. A higher VHT may be a result of an increased demand but also would indicate possible congestion within the cordoned areas resulting in travel time delays.

3.1.1.1 Richmond/ North Richmond area

Table 3-1 provides a summary of VHT in the Richmond area during the AM peak for the 2018 Base Case, as well as for all future scenarios assessed, including the 2027 Base Case, whilst Table 3-2 provides a summary of VHT during the PM peak.

VHT provided is generally for the worst one-hour period within the 3.5-hour peak period assessed. It should be noted that the 2027 Base Case was compared to the 2018 Base Case to obtain difference in VHT, while all other future year scenarios (Scenario 1 to Scenario 3) were compared against the 2027 Base Case to obtain difference in VHT.

It can be seen that VHT experienced by drivers in future years generally increases, which is anticipated given the increase in traffic demand. Further detailed discussion of traffic modelling results for each future year scenario is provided in Section 4 of this report.

Table 3-1 VHT during the AM peak within the Richmond cordoned area for 2018 and all 2027 future scenarios (1hr)

Scenario	2018AM Base Case	2027AM Base Case *	2027AM Scenario 1	2027AM Scenario 2	2027AM Scenario 3
VHT (hrs/hr)	535	685	744	716	708
Difference in VHT (hrs)	-	150	59	31	23
Difference in VHT (%)	-	28%	9%	5%	3%

*Note: *2027 Base Case was compared to 2018 Base Case to obtain the difference in VHT*

Table 3-2 VHT during the PM peak within the Richmond cordoned area for 2018 and all 2027 future scenarios

Scenario	2018PM Base Case	2027PM Base Case *	2027PM Scenario 1	2027PM Scenario 2	2027PM Scenario 3
VHT (hrs/hr)	584	746	1,150	789	813
Difference in VHT (hrs)	-	161	404	43	68
Difference in VHT (%)	-	28%	54%	6%	9%

*Note: *2027 Base Case was compared to 2018 Base Case to obtain the difference in VHT*

3.1.1.2 Windsor area

Similar to the Richmond area, Table 3-3 summarises VHT experienced in the Windsor area during the morning peak period, while Table 3-4 provides a summary of VHT experienced during the evening peak period. As per the Richmond area, VHT for each future year scenario generally increases when compared to the relevant corresponding base case. Further more detailed results are discussed in Section 4 of this report.

Table 3-3 VHT during the AM peak within the Windsor cordoned area for 2018 and all 2027 future scenarios

Scenario	2018AM Base Case	2027AM Base Case *	2027AM Scenario 1	2027AM Scenario 2	2027AM Scenario 3
VHT (hrs/hr)	827	924	959	924	926
Difference in VHT (hrs)	-	96	36	0	2
Difference in VHT (%)	-	12%	4%	0%	0%

*Note: *2027 Base Case was compared to 2018 Base Case to obtain the difference in VHT*

Table 3-4 VHT during the PM peak within the Windsor cordoned area for 2018 and all 2027 future scenarios

Scenario	2018PM Base Case	2027PM Base Case *	2027PM Scenario 1	2027PM Scenario 2	2027PM Scenario 3
VHT (hrs)	798	1,109	1,156	1,165	1,229
Difference in VHT (hrs)	-	311	47	55	120
Difference in VHT (%)	-	39%	4%	5%	11%

*Note: *2027 Base Case was compared to 2018 Base Case to obtain the difference in VHT*

3.2 Intersection Performance

SIDRA analysis was conducted for a number of key intersections utilising turning volumes extracted from the dynamic simulation for future year scenarios. For the intersection assessment in 2018, traffic volumes obtained from Council were utilised. The traffic volumes obtained from Council were adjusted to include growth factors where appropriate and were balanced against adjacent intersection counts.

The results reported are in accordance with the recommendations in the RMS Traffic Modelling Guidelines, where the average delays of the worst performing movement are reported for priority-controlled intersections and roundabouts. Average delays for the whole intersection are reported for signalised intersections. The RMS criteria for assessing the LOS of intersections are reproduced in Table 3-5 below.

Table 3-5 Key RMS Level of Service Criteria for Intersections

Level of Service	Average Delay per Vehicle (sec/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	<14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays. Roundabouts require other control mode	At capacity, requires other control mode
F	>70	Unsatisfactory with excessive queuing	Unsatisfactory with excessive queuing

3.2.1 Richmond/ North Richmond area

Three key intersections were analysed in SIDRA within the Richmond area, as follows:

- Bells Line of Road (BLOR)/ Charles Street (priority-controlled)
- BLOR/ Grose Vale Road/ Terrace Road (signalised)
- BLOR/ Yarramundi Lane/ Old Kurrajong Road (priority-controlled)

The first two intersections were modelled as a network in SIDRA, while the intersection of BLOR/ Yarramundi Lane/ Old Kurrajong Road was modelled as a single isolated intersection.

Table 3-6 provides a summary of the results obtained from SIDRA for each scenario during the AM peak, while Table 3-7 tabulates the results for each scenario during the PM peak. For the intersection of BLOR/ Yarramundi Lane/ Old Kurrajong, average approach delays in the PM peak were extracted from AIMSUN with the worst approach delays reported in the table. This is because SIDRA is unable to provide an assessment of the left turn merge from Yarramundi Lane into BLOR westbound mainline traffic.

Table 3-6 Key Intersection performance during the AM peak at Richmond for 2018 and all 2027 future year scenarios

Scenario	BLOR/ Charles St			BLOR/ Grose Vale Rd/ Terrace Rd			BLOR/ Yarramundi Ln/ Old Kurrajong Rd		
	DOS	Avg Delay (s)	LOS	DOS	Avg Delay (s)	LOS	DOS	Avg Delay (s)	LOS
2018 AM Base Case	0.54	29	C	0.84	39	C	0.66	54	D
2027 AM Base Case	0.54	33	C	0.86	40	C	0.83	85	F
2027 AM Scenario 1	1.57	552	F	1.02*	75	F	0.76	143	F
2027 AM Scenario 2	0.61	32	C	0.95	51	D	0.85	92	F
2027 AM Scenario 3	0.56	32	C	0.90	43	D	0.85	94	F

Note: * constrained arrival due to upstream intersection operating at capacity

Table 3-7 Key Intersection performance during the PM peak at Richmond for 2018 and all 2027 future year scenarios

Scenario	BLOR/ Charles St			BLOR/ Grose Vale Rd/ Terrace Rd			BLOR/ Yarramundi Ln/ Old Kurrajong Rd	
	DOS	Avg Delay (s)	LOS	DOS	Avg Delay (s)	LOS	Avg Delay from AIMSUN (s)*	LOS from AIMSUN*
2018 PM Base Case	0.46	23	B	0.98	52	D	12	B
2027 PM Base Case	0.54	25	B	0.85	35	C	70	E
2027 PM Scenario 1	0.51	22	B	0.87	36	C	615	F
2027 PM Scenario 2	0.66	28	B	0.97	43	C	131	F
2027 PM Scenario 3	0.56	23	B	0.98	46	D	223	F

Note: * Approach average delays from Aimsun reported as SIDRA was unable to provide assessment of left turn merge capacity issue from Yarramundi Lane to BLOR

Figure 3-2 to Figure 3-6 provide visual presentation of the LOS at each intersection for all the scenarios during the morning peak. Also included in the figures are the estimated hourly traffic volumes crossing the Richmond Bridge in the southbound direction, which represents the peak direction during the AM peak.

Figure 3-7 to Figure 3-11 provide visual presentation of intersections LOS during the PM peak, as well as the estimated hourly traffic volumes crossing the Richmond Bridge in the peak northbound direction. Detailed discussion of the results may be found in Section 4 of this report.

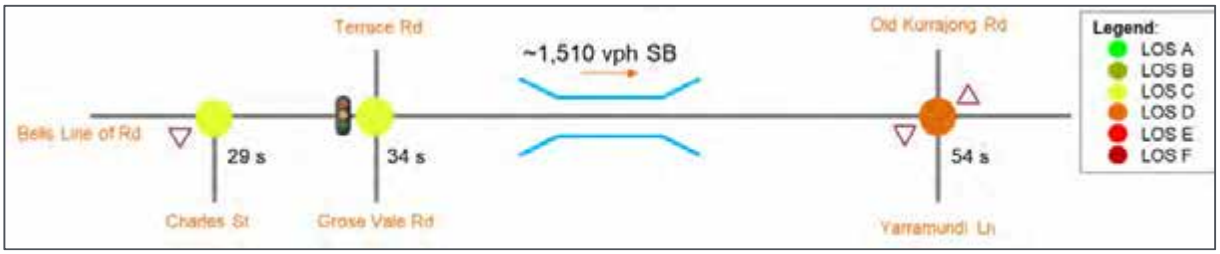


Figure 3-2 LOS of intersections adjacent to Richmond Bridge for 2018 Base Case during the morning peak

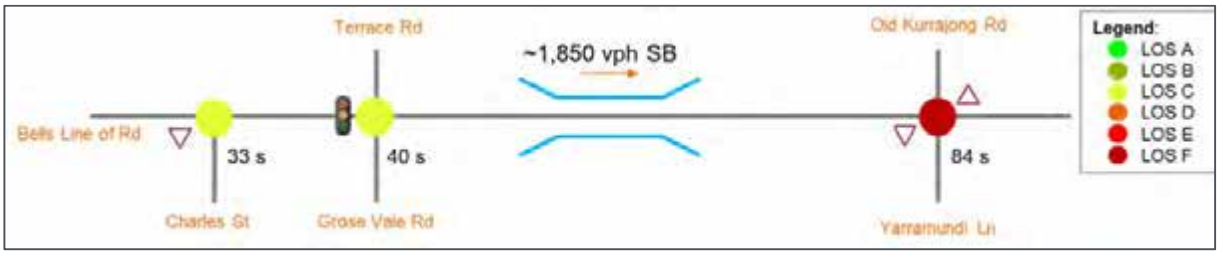


Figure 3-3 LOS of intersections adjacent to Richmond Bridge for 2027 Base Case during the morning peak

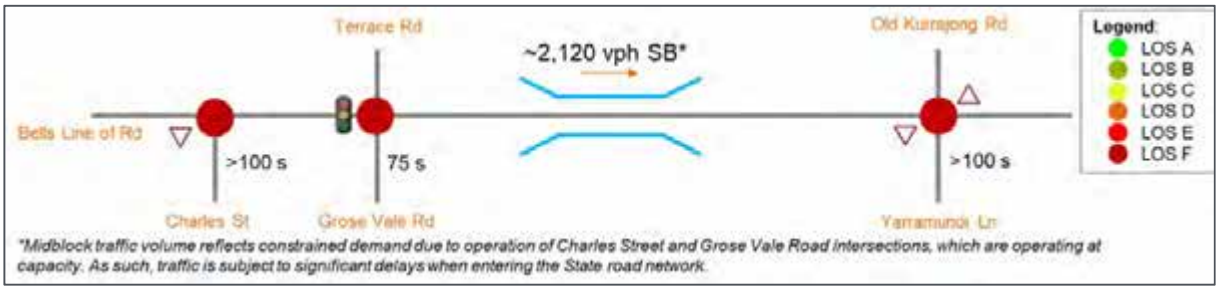


Figure 3-4 LOS of intersections adjacent to Richmond Bridge for 2027 Scenario 1 during the morning peak

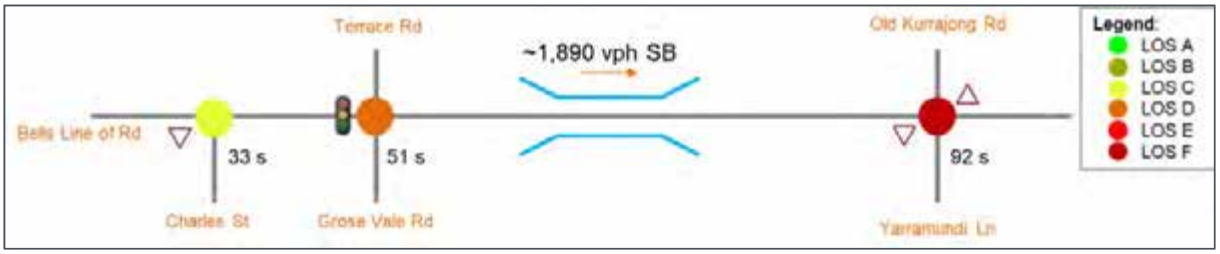


Figure 3-5 LOS of intersections adjacent to Richmond Bridge for 2027 Scenario 2 during the morning peak

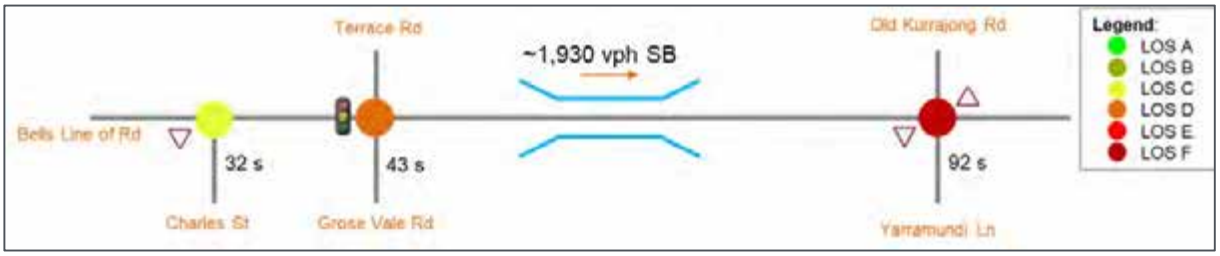


Figure 3-6 LOS of intersections adjacent to Richmond Bridge for 2027 Scenario 3 during the morning peak

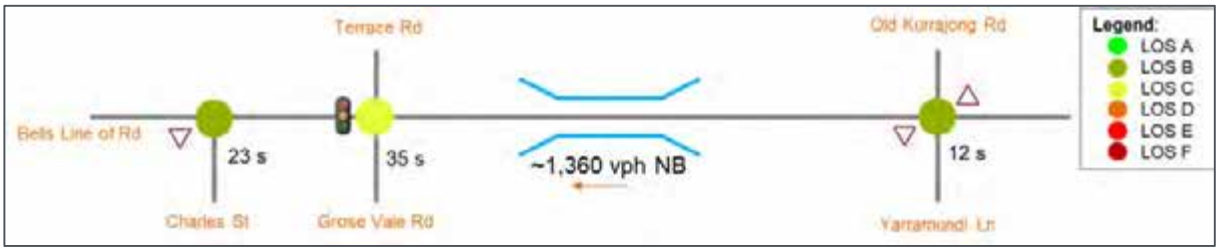


Figure 3-7 LOS of intersections adjacent to Richmond Bridge for 2018 Base Case during the evening peak

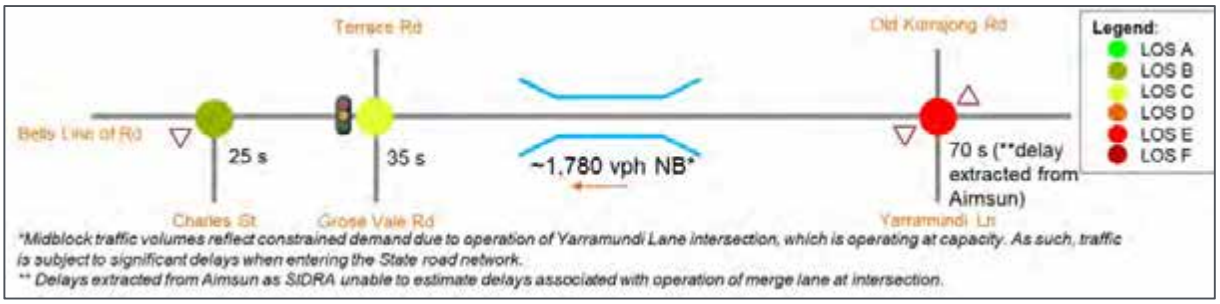


Figure 3-8 LOS of intersections adjacent to Richmond Bridge for 2027 Base Case during the evening peak

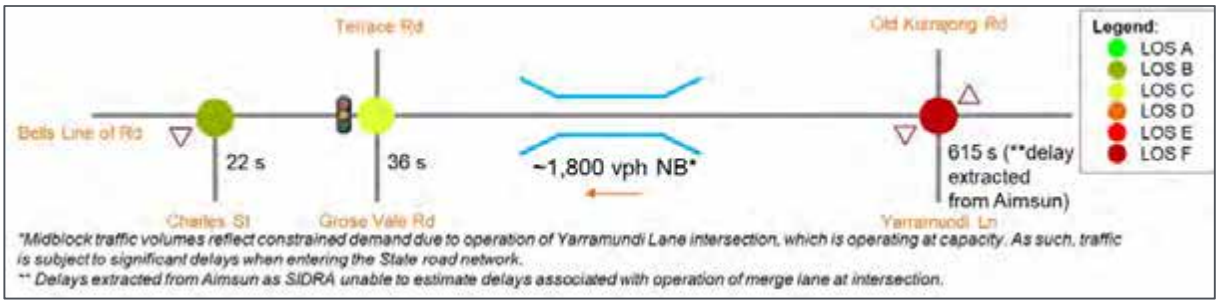


Figure 3-9 LOS of intersections adjacent to Richmond Bridge for 2027 Scenario 1 during the evening peak

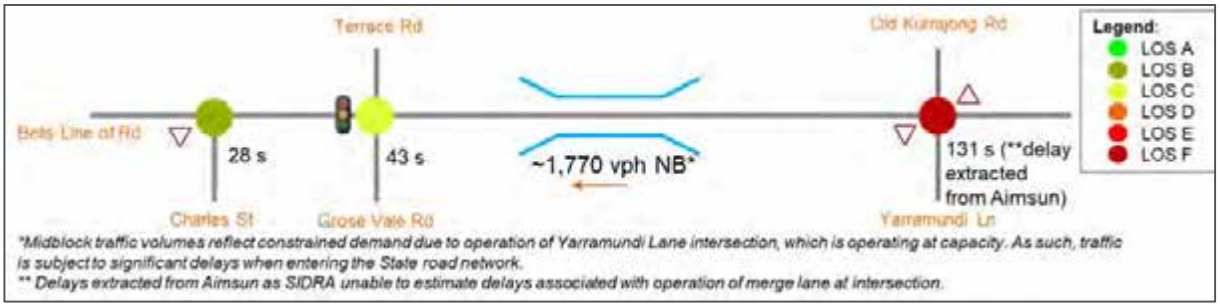


Figure 3-10 LOS of intersections adjacent to Richmond Bridge for 2027 Scenario 2 during the evening peak

Figure 3-11 LOS of intersections adjacent to Richmond Bridge for 2027 Scenario 3 during the evening peak

3.2.2 Windsor

For the Windsor area, the three key intersections analysed are as follows:

- Bridge Street/ George Street (roundabout in 2018, signalised in 2027)
- Bridge Street/ Macquarie Street (signalised)
- Bridge Street/ Court Street (priority-controlled)

All three intersections were modelled as a network in SIDRA.

Table 3-8 provides a summary of the results obtained from SIDRA for each scenario during the AM peak, while Table 3-9 provides the results for each scenario during the PM peak. It should be noted that during the PM peak, due to the high degree of saturation (DOS) at the Bridge Street/ Macquarie Street intersection in 2027, arrival flows at the other two intersections are constrained, which impacts on reported intersection performance.

Table 3-8 Key Intersection performance during the AM peak at Windsor for 2018 and all 2027 future year scenarios

Scenario	Bridge St/ George St			Bridge St/ Macquarie St			Bridge St/ Court St		
	DOS	Avg Delays (s)	LOS	DOS	Avg Delays (s)	LOS	DOS	Avg Delays (s)	LOS
2018 AM Base Case	0.75	16	B	0.88	22	B	0.47	45	D
2027 AM Base Case	0.53	2	A	0.89	24	B	0.48	34	C
2027 AM Scenario 1	0.58	3	A	0.91	23	B	0.48	34	C
2027 AM Scenario 2	0.54	3	A	0.90	23	B	0.46	36	C
2027 AM Scenario 3	0.50	2	A	0.90	23	B	0.44	32	C

Table 3-9 Key Intersection performance during the PM peak at Windsor for 2018 and all 2027 future year scenarios

Scenario	Bridge St/ George St			Bridge St/ Macquarie St			Bridge St/ Court St		
	DOS	Avg Delays (s)	LOS	DOS	Avg Delays (s)	LOS	DOS	Avg Delays (s)	LOS
2018 PM Base Case	0.93*	27	B	1.47	103	F	0.42	30	C
2027 PM Base Case	0.82*	3	A	1.14	112	F	0.72*	84	F
2027 PM Scenario 1	0.86*	3	A	1.13	114	F	0.66*	73	F
2027 PM Scenario 2	0.83*	3	A	1.10	97	F	0.77*	90	F
2027 PM Scenario 3	0.82*	3	A	1.11	101	F	0.80*	100	F

Note: * constrained arrival due to upstream intersection operating at capacity

Figure 3-12 to Figure 3-16 provide visual presentation of the LOS at each intersection for all the scenarios during the morning peak. Also included in the figures are the estimated hourly traffic volumes crossing the Windsor Bridge in the southbound direction during the AM peak.

Figure 3-17 to Figure 3-21 provide visual presentation of intersections LOS during the PM peak, as well as estimated hourly traffic volumes crossing the Windsor Bridge in the peak northbound direction. Detailed discussion of the results may be found in Section 4 of this report.

Figure 3-12 LOS of intersections adjacent to Windsor Bridge for 2018 Base Case during the morning peak

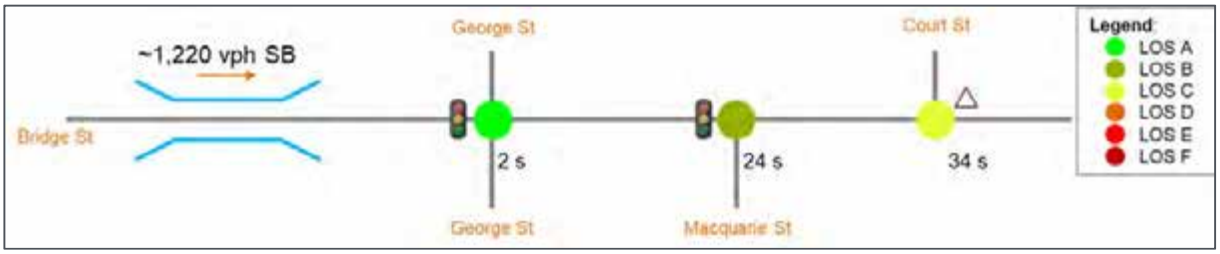


Figure 3-13 LOS of intersections adjacent to Windsor Bridge for 2027 Base Case during the morning peak

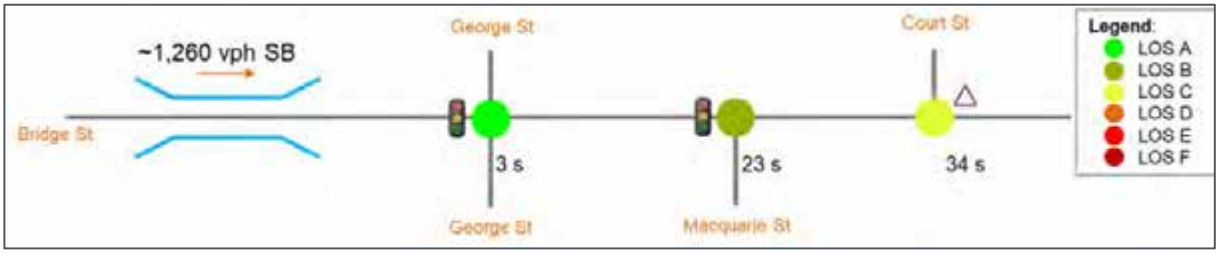


Figure 3-14 LOS of intersections adjacent to Windsor Bridge for 2027 Scenario 1 during the morning peak

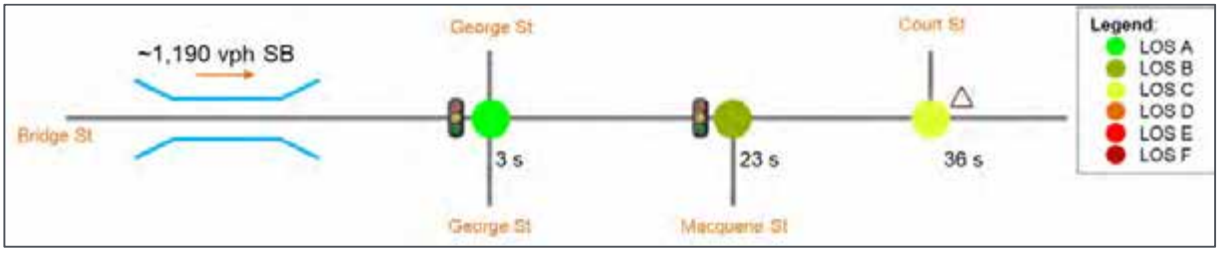


Figure 3-15 LOS of intersections adjacent to Windsor Bridge for 2027 Scenario 2 during the morning peak

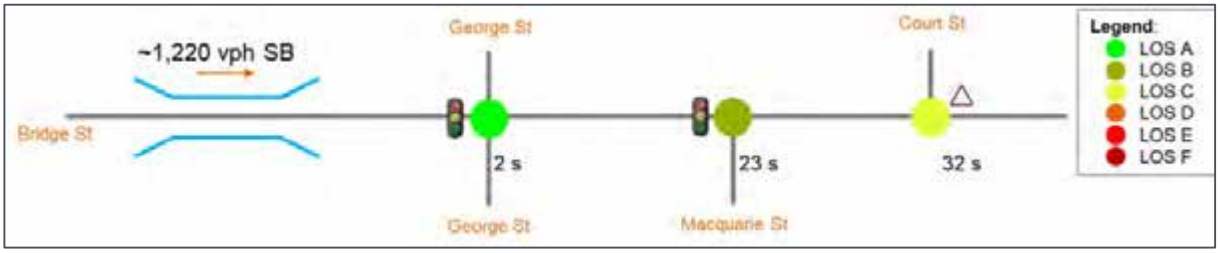


Figure 3-16 LOS of intersections adjacent to Windsor Bridge for 2027 Scenario 3 during the morning peak

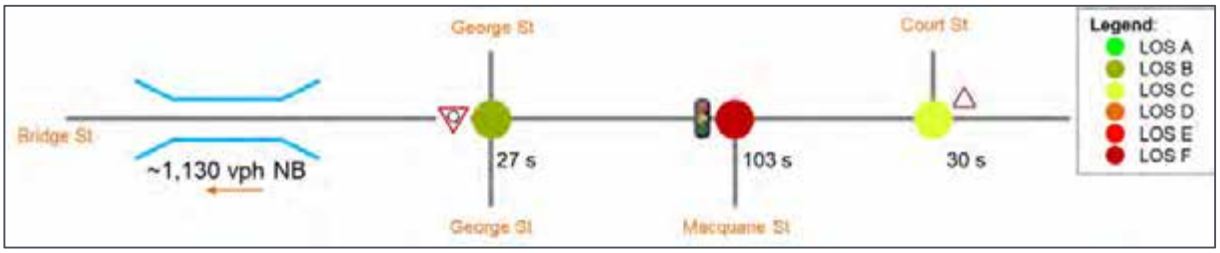


Figure 3-17 LOS of intersections adjacent to Windsor Bridge for 2018 Base Case during the evening peak

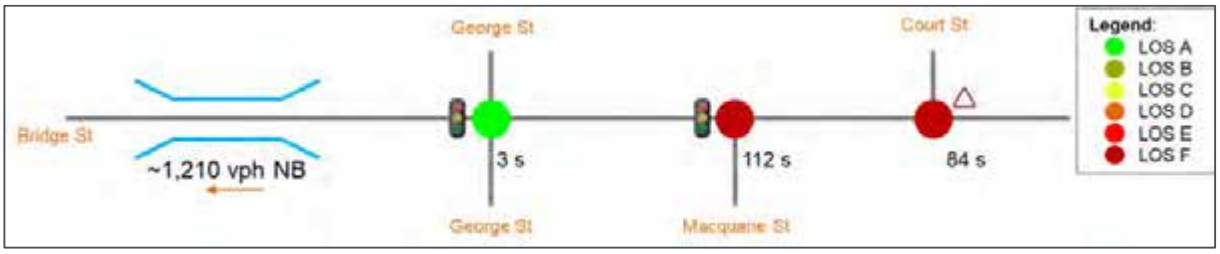


Figure 3-18 LOS of intersections adjacent to Windsor Bridge for 2027 Base Case during the evening peak

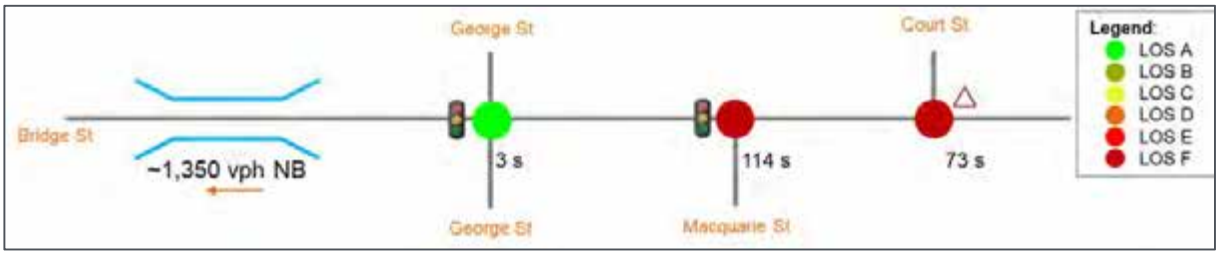


Figure 3-19 LOS of intersections adjacent to Windsor Bridge for 2027 Scenario 1 during the evening peak

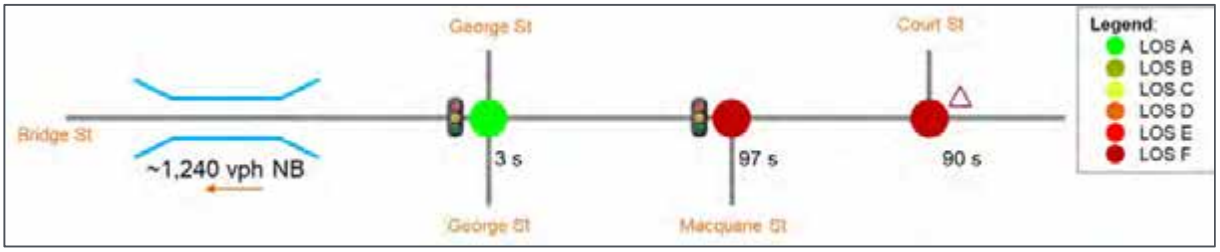


Figure 3-20 LOS of intersections adjacent to Windsor Bridge for 2027 Scenario 2 during the evening peak

Figure 3-21 LOS of intersections adjacent to Windsor Bridge for 2027 Scenario 3 during the evening peak

4 Impact on Road Network Performance

The following sections discuss the impact of each scenario on the performance of the future road network, referencing the results presented in Section 3 of this report.

4.1 2027 Future Base Case – Impact of Committed Growth on Road Network

The future base case was evaluated for the year 2027 as described in Section 2.2.1. Traffic demand increases in 2027 due to both background traffic growth and committed development. The 2027 Base Case includes all committed infrastructure upgrades and future development, as advised by Council.

4.1.1 Richmond

Within the Richmond area, Table 3-1 and Table 3-2 show that the VHT in the 2027 Base Case would increase approximately 28% during both the AM and PM peak hours when compared to 2018. This is anticipated due to the additional hours contributed by higher traffic demand, as well as by the increase in delays, as a result of higher vehicle trips. This is also supported by traffic flow density plots for the worst half hour period, which show higher density on the northbound approach to the Richmond Bridge in the 2027 Base Case during both the AM peak hour (refer Figure 4-1 for 2018 Base Case plot and Figure 4-2 for 2027 Base Case plot) and PM peak hour (refer Figure 4-3 for 2018 Base Case plot and Figure 4-4 for 2027 Base Case plot).

Figure 4-1 Traffic density plot at Richmond for 2018 Base Case during the morning peak

Figure 4-2 Traffic density plot at Richmond for 2027 Base Case during the morning peak

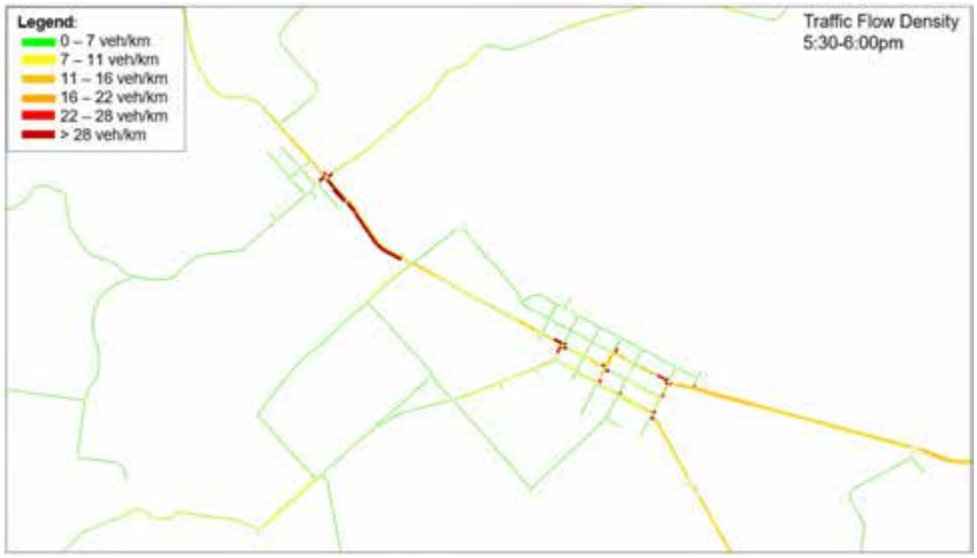


Figure 4-3 Traffic density plot at Richmond for 2018 Base Case during the evening peak

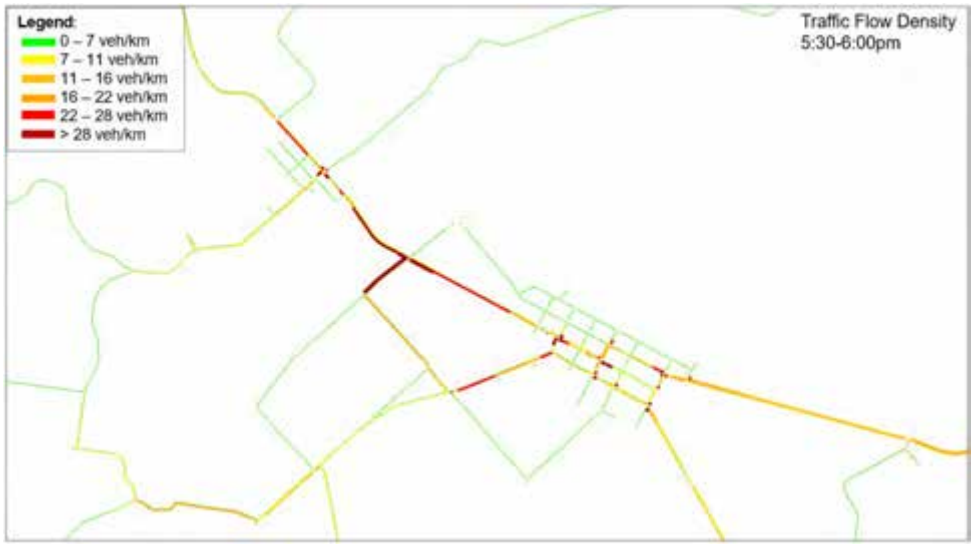


Figure 4-4 Traffic density plot at Richmond for 2027 Base Case during the evening peak

A comparison of the SIDRA results in Table 3-6 and Table 3-7 also shows that in the 2027 Base Case, there would be increases in both DOS and average delays at all three intersections. It should be noted that although the LOS for the BLOR/ Yarramundi Lane/ Kurrajong Road intersection was reported as F during the 2027 AM Base Case, the traffic volume for the worst performing movement is anticipated to be low and would be unlikely to result in significant disruptions to the road network.

The Richmond Bridge would operate at capacity in the 2027 Base Case, with average hourly traffic volumes around 1,800 vph. It is anticipated that duplication of the Richmond Bridge would be required, particularly if additional development is envisaged in the longer term within the Hawkesbury area. Upgrades to the BLOR/ Yarramundi Lane/ Old Kurrajong Road intersection would also increase traffic demand across the Richmond Bridge during the PM peak.

The new Grose River Bridge, which is included in the future base case, would provide additional north-south capacity to the road network, particularly for vehicles travelling to/ from North Richmond and further afield.

The analysis was carried out to understand the potential for redistribution of traffic due to the completion of the new bridge, particularly relating to local roads between Kurrajong Village and the new bridge, including Old Bells Line of Road, Grose Vale Road and Grose Wold Road.

In this regard, analysis suggests that the new bridge may result in some 100 additional trips being diverted from Bells Line of Road in the peak direction during each peak period. Instead of using the Bells Line of Road and the Richmond Bridge, this traffic would be diverted to use the Old Bells Line of Road and Grose Vale Road to utilise the Grose River Bridge. Whilst some redistribution of traffic is to be expected, modelling suggests that potential increase in volumes on Old Bells Line of Road as a result of redistributed traffic is unlikely to be significant.

4.1.2 Windsor

For the Windsor area there was also a general increase in VHT in the 2027 Base Case when compared to 2018. The increase in VHT was 12% during the morning peak, with a more significant increase of 39% during the evening peak. This suggests that there might be localised areas operating at capacity, increasing the time required for traffic to travel to, from, through or within the Windsor area. The significant increase in VHT is reflected in the traffic flow density plot for the 2027 PM Base Case (Figure 4-6) when compared to the 2018 PM Base Case traffic flow density plot (Figure 4-5). There were more road sections with higher density in the 2027 PM Base Case.

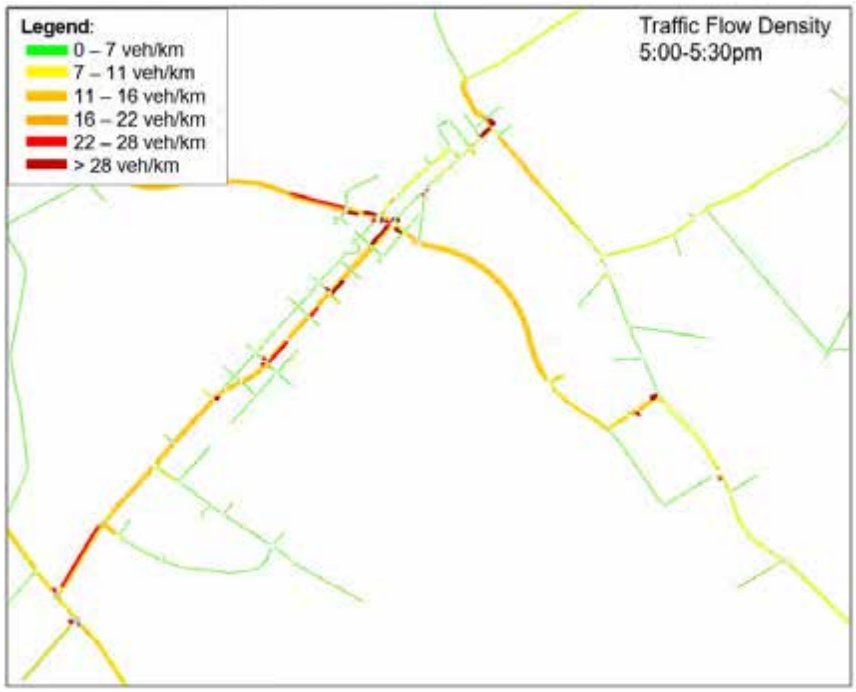


Figure 4-5 Traffic density plot at Windsor for 2018 Base Case during the evening peak

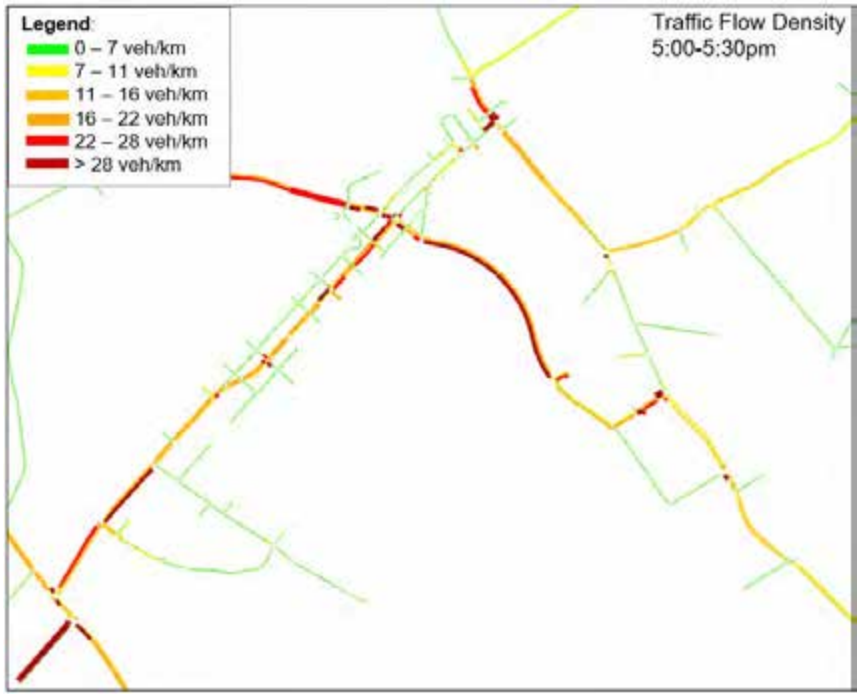


Figure 4-6 Traffic density plot at Windsor for 2027 Base Case during the evening peak

When comparing the SIDRA intersection results for both the 2027 AM Base Case and 2018 AM Base Case, it may be seen that the DOS for both the Bridge Street/ George Street and Bridge Street/ Macquarie Street intersections reduced during the morning peak. This may be due to signalisation of the Bridge Street/ George Street intersection, which increases capacity at the intersection. The upgrade has also likely contributed to maintaining the LOS of all three intersections, with the intersection of Bridge Street/ Court Street experiencing a slight improvement in LOS.

During the evening peak, however, due to an increase in traffic volumes, both the Bridge Street/ Macquarie Street and Bridge Street/ Court Street intersections would experience deterioration in LOS. The Bridge Street/ Macquarie Street intersection would operate at a DOS higher than 1, indicating that traffic demand would exceed capacity. Due to DOS exceeding 1, arrival flows at both the Bridge Street/ George Street and Bridge Street/ Court Street intersections would be reduced, as vehicles would be held up at the Bridge Street/ Macquarie Street intersection.

4.2 Scenario 1 – Impact on road network without the Grose River Bridge

Scenario 1 was considered to evaluate the impact on road network performance in the event that the Grose River Bridge was not in place by 2027. The key performance parameters for Scenario 1 were compared to the 2027 Base Case to determine quantitative impacts of the Grose River Bridge.

4.2.1 Richmond

It can be observed from Table 3-1 and Table 3-2 that there would be an increase in VHT during both peak hours, particularly during the PM peak, when the VHT would increase by approximately 54% compared to the 2027 PM Base Case.

During the AM peak, although the increase in VHT would be less than 10%, the impact of not having the Grose River Bridge would be significant at North Richmond, particularly at intersections providing access to the BLOR. This is evident in the traffic flow density plot (Figure 4-7), where the density on roads surrounding the intersections of BLOR/ Charles Street and BLOR/ Grose Vale Road/ Terrace Road would significantly increase compared to the 2027 AM Base Case (Figure 4-2). However, as North Richmond forms only a small part of the Richmond cordoned area, the average VHT reported at Richmond does not reflect the impact at North Richmond.

Figure 4-7 Traffic density plot at Richmond for 2027 Scenario 1 during the morning peak

The impact of not having the Grose River Bridge as part of the future road network is also supported by the results obtained from the SIDRA traffic modelling, which shows that the intersections of BLOR/ Charles Street and BLOR/ Grose Vale Road/ Terrace Road would both operate at LOS F with DOS higher than 1. It may also be observed from Figure 3-4 that the volume of traffic crossing Richmond Bridge increases compared to the 2027 AM Base Case. In this regard, actual demand would be even higher if traffic held back at the intersections of BLOR/ Charles Street and BLOR/ Grose Vale Road/ Terrace Road were to be released.

For the intersection of BLOR/ Yarramundi Lane/ Old Kurrajong Road, similar to the 2027 AM Base Case, traffic volumes for the critical movement during the AM peak, which would perform at LOS F, were estimated to be low compared to other movements and would be unlikely to cause major disruptions to the road network.

During the PM peak, the area-wide impact of not having the Grose River Bridge would be more prominent, as indicated by the 54% increase in VHT and the traffic density plot in Figure 4-8. The significant increase in VHT is the amplification of an issue already existing in the 2027 PM Base Case involving a bottleneck at the Bells Line of Road/ Yarramundi Lane/ Old Kurrajong Road intersection (as shown in the traffic flow density plot in Figure 4-4). In the event that the Grose River Bridge is not completed by 2027, traffic arriving from Penrith, which would otherwise utilise the Grose River Bridge, would be likely to use the BLOR/ Yarramundi Lane intersection in order to cross the Richmond Bridge. This would cause delays at the intersection to increase exponentially, as the intersection would already operate at capacity in the 2027 PM Base Case.

Figure 4-8 Traffic density plot at Richmond for 2027 Scenario 1 during the evening peak

Results obtained from SIDRA (Table 3-7) indicate similar performance of the intersections north of the Richmond Bridge compared to the 2027 PM Base. This is likely to be due to traffic being held back at the upstream intersection of BLOR/ Yarramundi Lane, resulting in lower volumes arriving at intersections north of the bridge.

SIDRA indicates that the intersection of BLOR/ Yarramundi Lane/ Old Kurrajong Road would operate at LOS E with a DOS lower than the 2027 PM Base Case. This is due to limitations in the SIDRA modelling software, as SIDRA is unable to assess delays from the left turn merge from Yarramundi Lane into northbound through traffic on BLOR. Average delays were therefore extracted from AIMSUN for Yarramundi Lane for purposes of comparison, which show delays of 615 seconds per vehicle, corresponding to the high density observed in Figure 4-8.

It may be observed from Figure 3-9 that northbound traffic volumes on Richmond Bridge are similar to the 2027 PM Base Case. This is a result of constrained capacity at the BLOR/ Yarramundi intersection merge upstream, where the volume at the crossing reflects the capacity at the merge point on BLOR.

4.2.2 Windsor

VHT at Windsor is only slightly affected by not having the Grose River Bridge in place by 2027 with a 4% increase during both the AM and PM peak hours (refer Table 3-3 and Table 3-4 respectively). As expected, the main impacts relating to the Grose River Bridge would be in the Richmond area.

At the Windsor Bridge during the AM peak, Table 3-8 shows that the three intersections assessed would perform similarly to the 2027 AM Base Case, while Figure 3-14 shows that there would only be a slight increase in traffic volumes crossing the bridge in the peak southbound direction. As congestion at the Richmond Bridge during the AM peak was not significant, only a minimal amount of traffic would detour to use the Windsor Bridge as an alternative route.

During the PM peak, however, Figure 3-18 shows there would be an increase of approximately 12% in traffic volumes (from 1,210 vph to 1,350 vph) crossing the Windsor Bridge in the peak northbound direction. This is likely due to the shift in traffic routes to avoid congestion at the intersection of BLOR/ Yarramundi Lane/ Old Kurrajong Road. The intersection assessment summarised in Table 3-9 shows that all three intersections assessed would perform similarly to the 2027 PM Base Case.

4.3 Scenario 2 – Impact of the Kurmond and Kurrajong Investigation Area

Scenario 2 was considered to assess the impact of developing 200 residential dwellings within the Kurmond and Kurrajong Investigation Area.

4.3.1 Richmond

This development would be unlikely to result in significant impacts on the surrounding road network, which is supported by only a slight increase in VHT during both the AM (5% in Table 3-1) and PM (6% in Table 3-2) peak hours. Although congestion appears to have reduced on Yarramundi Lane, the BLOR northbound approach is reported as having the highest delays (131 seconds) at the intersection, as shown in Table 3-7.

4.3.2 Windsor

Similar to the Richmond area, development at the Kurmond and Kurrajong Investigation Area is not expected to result in significant impacts to the road network at Windsor, with minimal increase in the VHT during the AM peak (0% in Table 3-3) and PM peak (5% in Table 3-4).

4.4 Scenario 3 – Impact of 5% Uplift in Trips in Richmond and Windsor Town Centres

Scenario 3 was considered to provide a high-level assessment of the impact of a 5% uplift in trips in the Richmond and Windsor town centres.

4.4.1 Richmond

In Richmond, VHT increases slightly during the AM and PM peak hours, with 3% (Table 3-1) and 9% (Table 3-2) increases respectively.

SIDRA analysis of the three intersections during the AM peak (Table 3-6) revealed similar performance as the 2027 AM Base Case. SIDRA results for the PM peak (Table 3-7) show that the intersections of BLOR/ Charles Street and BLOR/ Grose Vale Road/ Terrace Road would also perform similarly to the 2027 PM Base Case. For the intersection of BLOR/ Yarramundi Lane/ Old Kurrajong Road, delays extracted from Aimsun show an increase in delays compared to the 2027 PM Base Case.

4.4.2 Windsor

In Windsor, minimal increase in VHT was observed during the AM peak (Table 3-3), while an 11% increase in VHT was observed during the PM peak (Table 3-4).

SIDRA analysis shows that all three intersections have similar performance during the AM peak (Table 3-8) compared to the 2027 AM Base. During the PM peak (Table 3-9), the intersections of Bridge Street/ George Street and Bridge Street/ Macquarie Street show similar performance to the 2027 PM Base Case, with the intersection of Bridge Street/ Court Street performing worse than the 2027 PM Base Case.

4.5 General Findings

Analysis of all future year scenarios provides an insight into road network performance against the future year base case. Below are general findings derived from the results obtained from both AIMSUN and SIDRA models:

- The Grose River Bridge will be required by 2027 to accommodate future trips generated by the Redbank development and other committed development to reduce congestion on intersections in the Richmond area, including Yarramundi Lane in the PM peak.
- Upgrades to the BLOR/ Yarramundi Lane/ Old Kurrajong Road intersection would be required in the 2027 Base Case to improve the merging capacity for left-turn traffic from Yarramundi Lane onto BLOR.
- The Richmond Bridge would operate at capacity in the 2027 Base Case, with average hourly traffic volumes around 1,800 vph. It is anticipated that duplication of the Richmond Bridge would be required, particularly if additional development is envisaged in the longer term within the Hawkesbury area. Upgrades to the BLOR/ Yarramundi Lane/ Old Kurrajong Road intersection would also increase traffic demand across the Richmond Bridge during the PM peak.
- Congestion was observed in the model at the George Street/ Blacktown Road/ Richmond Road and The Northern Road/ Richmond Road roundabouts in the 2027 future year scenarios, which suggests possible capacity issues at these locations in future.
- Future model runs for the evening peak period also suggest insufficient capacity at the Windsor Road/ Bandon Road/ Chapman Road intersection. This is due to the proposed future extension of Bandon Road to the west. Should the project be realised, a more detailed study would be warranted to evaluate the impact of the extension on the road network.

5 Conclusions and Recommendations

SMEC was commissioned by Hawkesbury City Council (Council) to undertake a traffic study to assist in planning for the transport and traffic needs of the Hawkesbury community, as well as cross regional requirements. This stage of the study (Stage 2) involved the development of a mesoscopic model using AIMSUN software to allow evaluation of the impact of various future year scenarios on the road network supported by SIDRA modelling, where required.

It should be noted that the future year scenarios analysed in this study along with the assumptions adopted were based on the current network conditions and information available at time of study preparation. SMEC are aware of strategic land use planning being undertaken by Hawkesbury City Council and adjoining councils external to the model area, which may trigger the need to revisit assumptions including trip patterns and trip tables in the future. In this regard, further analysis may be required at a future time to update the model where significant changes to either the road network or trip patterns occur or are identified as warranting adjustment to the model.

Four future year scenarios were assessed using the AIMSUN mesoscopic model:

- 2027 future year base case. This includes committed development and future infrastructure upgrades agreed with Council, including the new Grose River Bridge at Navua Reserve
- Scenario 1 – Impact on the road network without the Grose River Bridge in 2027
- Scenario 2 – Impact of the proposed Kurmond and Kurrajong Investigation Area in 2027
- Scenario 3 – Impact of 5% uplift in trips in the Richmond and Windsor town centre areas in 2027.

In addition to assessing future year scenarios using the AIMSUN mesoscopic model, SIDRA models were set up to assess six key intersections, as agreed with Council, including three intersections in the Richmond area and three intersections in the Windsor area.

Key findings obtained from traffic modelling are summarised below:

- The Grose River Bridge will be required in 2027 to accommodate future background traffic growth, as well as future trips generated by the Redbank development and other committed development to reduce congestion on intersections particularly in the Richmond area, including Yarramundi Lane in the PM peak.
- The new Grose River Bridge, which is included in the future base case, would provide additional north-south capacity to the road network, particularly for vehicles travelling to/ from North Richmond and further afield. A high-level analysis was carried out to understand the potential for redistribution of traffic due to the completion of the new bridge, particularly relating to local roads between Kurrajong Village and the new bridge, including Old Bells Line of Road, Grose Vale Road and Grose Wold Road. Whilst some redistribution of traffic is to be expected, modelling suggests that potential volumes are unlikely to be significant.
- Without the Grose River Bridge, the most impacted area would be North Richmond from trips generated by future dwellings associated with the Redbank development.
- Whilst the 200 residential dwellings assessed at the Kurmond and Kurrajong Investigation Area would increase the number of trips on the road network, particularly in the Richmond area, this is not anticipated to have a significant impact on the surrounding road network.
- Revitalisation of both the Richmond and Windsor town centres (assuming a 5% uplift in trips) would not have significant impact on either the Richmond, or Windsor road networks, apart from in the PM peak in the Windsor area, where there would be an 11% increase in VHT. It should however be noted that a more in-depth study of the impact of town centre revitalisation is recommended.
- Upgrades to the BLOR/ Yarramundi Lane/ Old Kurrajong Road intersection would be required in 2027 even with the new Grose River Bridge to improve the merging capacity for left-turn traffic from Yarramundi Lane onto BLOR.
- The Richmond Bridge would operate at capacity in the 2027 Base Case, with average hourly traffic volumes around 1,800 vph. It is anticipated that duplication of the Richmond Bridge would be required, particularly if additional development is envisaged in the longer term within the Hawkesbury area. Upgrades to the BLOR/ Yarramundi Lane/ Old Kurrajong Road intersection would be likely to increase traffic demand on Richmond Bridge during the PM peak, as demand on the bridge is currently constrained by capacity at this intersection.
- Congestion was observed in the model at the George Street/ Blacktown Road/ Richmond Road and The Northern Road/ Richmond Road roundabouts in the 2027 future year scenarios, which suggests possible capacity issues at these locations in future.

- Future model runs for the evening peak period also suggest insufficient capacity at the Windsor Road/ Bandon Road/ Chapman Road intersection. This is due to the proposed future extension of Bandon Road to the west. Should this extension be realised, a more detailed study would be warranted to evaluate the impact of the extension on the road network.

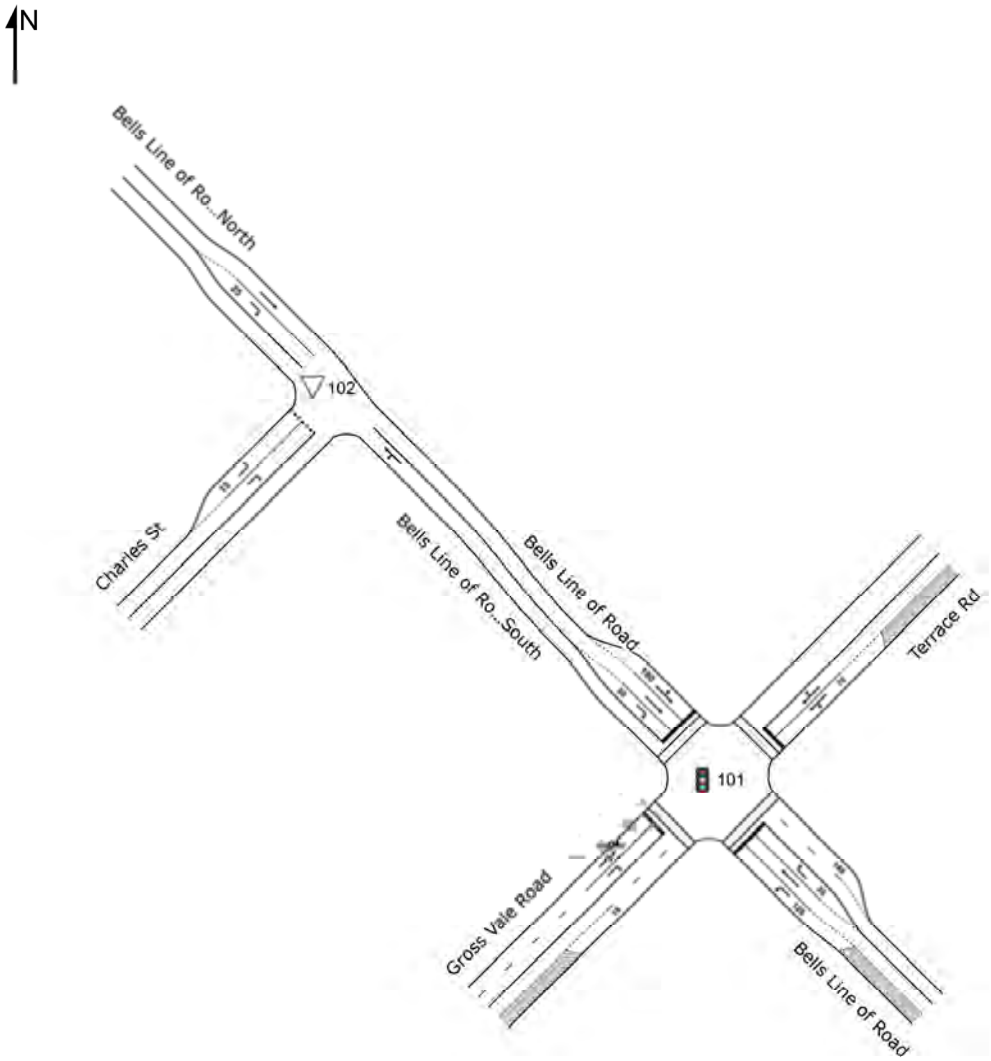
Appendix A SIDRA Model Outputs

RICHMOND

NETWORK LAYOUT

Network: N101 [2018AM BC With Bridge 8-9am]

New Network
Network Category: (None)



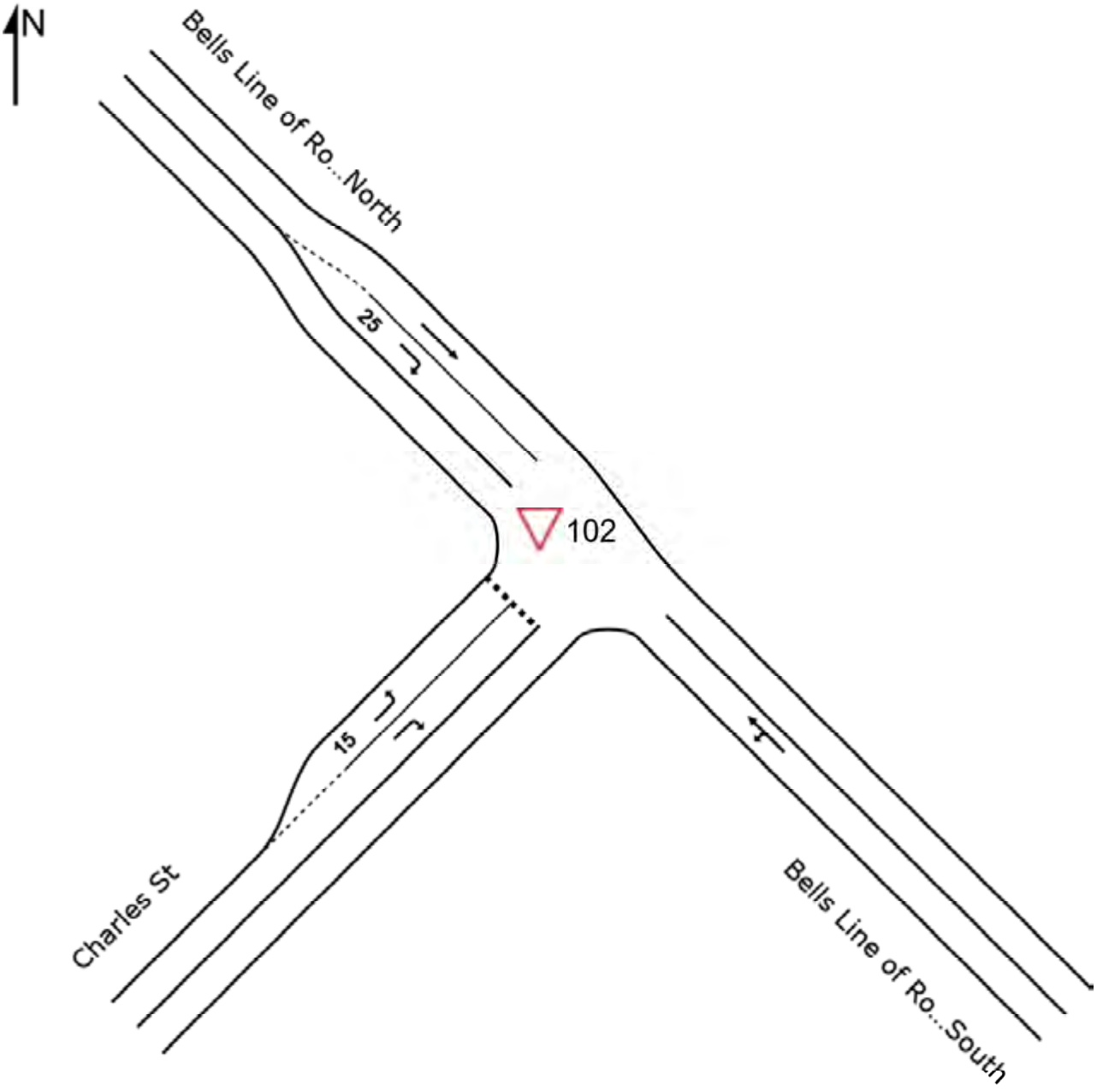
SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽102	NA	2018AM BC Charles St/ Bells Line of Rd -with new bridge 8-9am
101	NA	2018AM BC Bells Line of Road/Gross Vale Road/Terrace Rd-with new bridge 8-9am

Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 11:43:54 AM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

SITE LAYOUT

Site: 102 [2018AM BC Charles St/ Bells Line of Rd -with new bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:00:47 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 102 [2018AM BC Charles St/ Bells Line of Rd -with new bridge 8-9am]

Network: N101 [2018AM BC With Bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

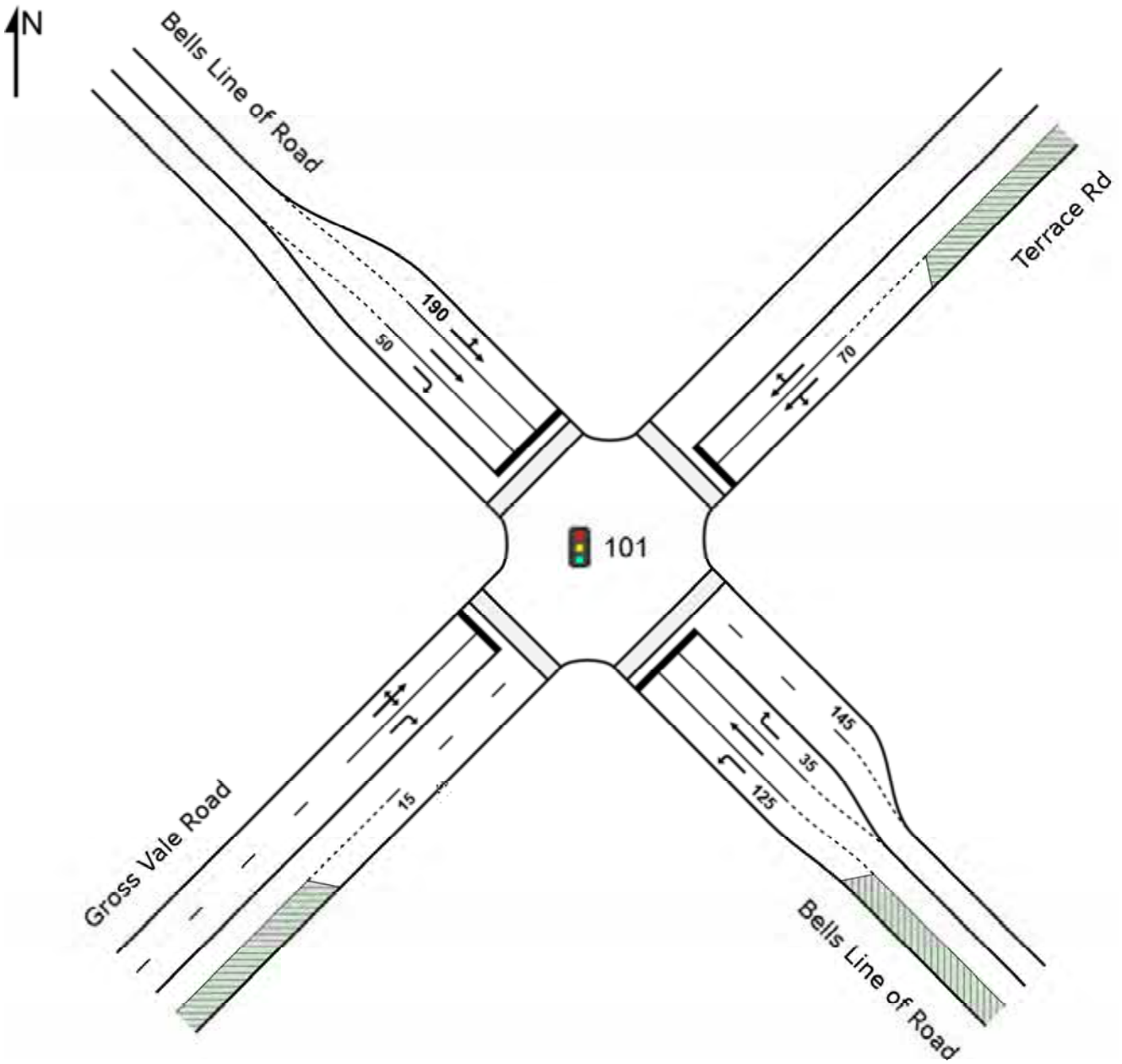
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road South														
1	L2	17	93.8	17	93.8	0.251	6.6	LOS A	0.0	0.0	0.00	0.02	0.00	43.6
2	T1	421	7.0	421	7.0	0.251	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	59.9
Approach		438	10.3	438	10.3	0.251	0.3	NA	0.0	0.0	0.00	0.02	0.00	59.5
NorthWest: Bells Line of Road North														
8	T1	909	3.2	909	3.2	0.501	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
9	R2	61	6.9	61	6.9	0.052	7.1	LOS A	0.1	0.7	0.46	0.63	0.46	47.3
Approach		971	3.5	971	3.5	0.501	0.5	NA	0.1	0.7	0.03	0.04	0.03	58.6
SouthWest: Charles St														
10	L2	117	7.2	117	7.2	0.107	6.1	LOS A	0.2	1.3	0.44	0.62	0.44	47.5
12	R2	104	7.1	104	7.1	0.537	29.3	LOS C	0.8	6.3	0.90	1.08	1.31	13.2
Approach		221	7.1	221	7.1	0.537	17.0	LOS B	0.8	6.3	0.66	0.84	0.85	33.2
All Vehicles		1629	5.8	1629	5.8	0.537	2.7	NA	0.8	6.3	0.11	0.14	0.13	54.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2018AM BC Bells Line of Road/Gross Vale Road/Terrace Rd-with new bridge 8-9am]

Site Category: (None)
Signals - Fixed Time Isolated



MOVEMENT SUMMARY

Site: 101 [2018AM BC Bells Line of Road/Gross Vale Road/ Terrace Rd-with new bridge 8-9am]

Network: N101 [2018AM BC With Bridge 8-9am]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 124 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road														
1	L2	148	8.5	148	8.5	0.152	11.6	LOS A	1.3	9.7	0.47	0.69	0.47	45.0
2	T1	367	10.3	367	10.3	0.843	40.3	LOS C	12.1	92.1	0.80	0.82	0.97	26.1
3	R2	126	10.0	126	10.0	0.463	27.6	LOS B	2.4	18.5	0.86	0.78	0.86	40.4
Approach		642	9.8	642	9.8	0.843	31.2	LOS C	12.1	92.1	0.74	0.78	0.84	33.1
NorthEast: Terrace Rd														
4	L2	239	3.1	239	3.1	0.727	35.8	LOS C	5.8	41.6	0.99	0.85	1.05	37.1
5	T1	53	4.0	53	4.0	0.520	57.9	LOS E	3.6	26.8	0.99	0.78	0.99	25.0
6	R2	47	8.9	47	8.9	0.520	63.6	LOS E	3.6	26.8	0.99	0.78	0.99	20.4
Approach		339	4.0	339	4.0	0.727	43.1	LOS D	5.8	41.6	0.99	0.83	1.03	32.9
NorthWest: Bells Line of Road														
7	L2	36	5.9	36	5.9	0.607	36.2	LOS C	13.0	94.1	0.84	0.75	0.84	34.4
8	T1	909	3.5	909	3.5	0.777	32.0	LOS C	15.2	109.5	0.86	0.77	0.87	34.8
9	R2	68	4.6	68	4.6	0.179	23.7	LOS B	1.3	9.1	0.73	0.73	0.73	29.9
Approach		1014	3.6	1014	3.6	0.777	31.6	LOS C	15.2	109.5	0.85	0.77	0.86	34.5
SouthWest: Gross Vale Road														
10	L2	11	30.0	11	30.0	0.656	56.0	LOS D	7.5	54.7	0.97	0.83	0.98	11.5
11	T1	33	3.2	33	3.2	0.656	50.1	LOS D	7.5	54.7	0.97	0.83	0.98	26.4
12	R2	441	4.5	441	4.5	0.831	61.2	LOS E	10.6	77.3	0.99	0.89	1.10	24.4
Approach		484	5.0	484	5.0	0.831	60.3	LOS E	10.6	77.3	0.99	0.88	1.09	24.4
All Vehicles		2479	5.6	2479	5.6	0.843	38.7	LOS C	15.2	109.5	0.87	0.80	0.92	31.5

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

Movement Performance - Pedestrians

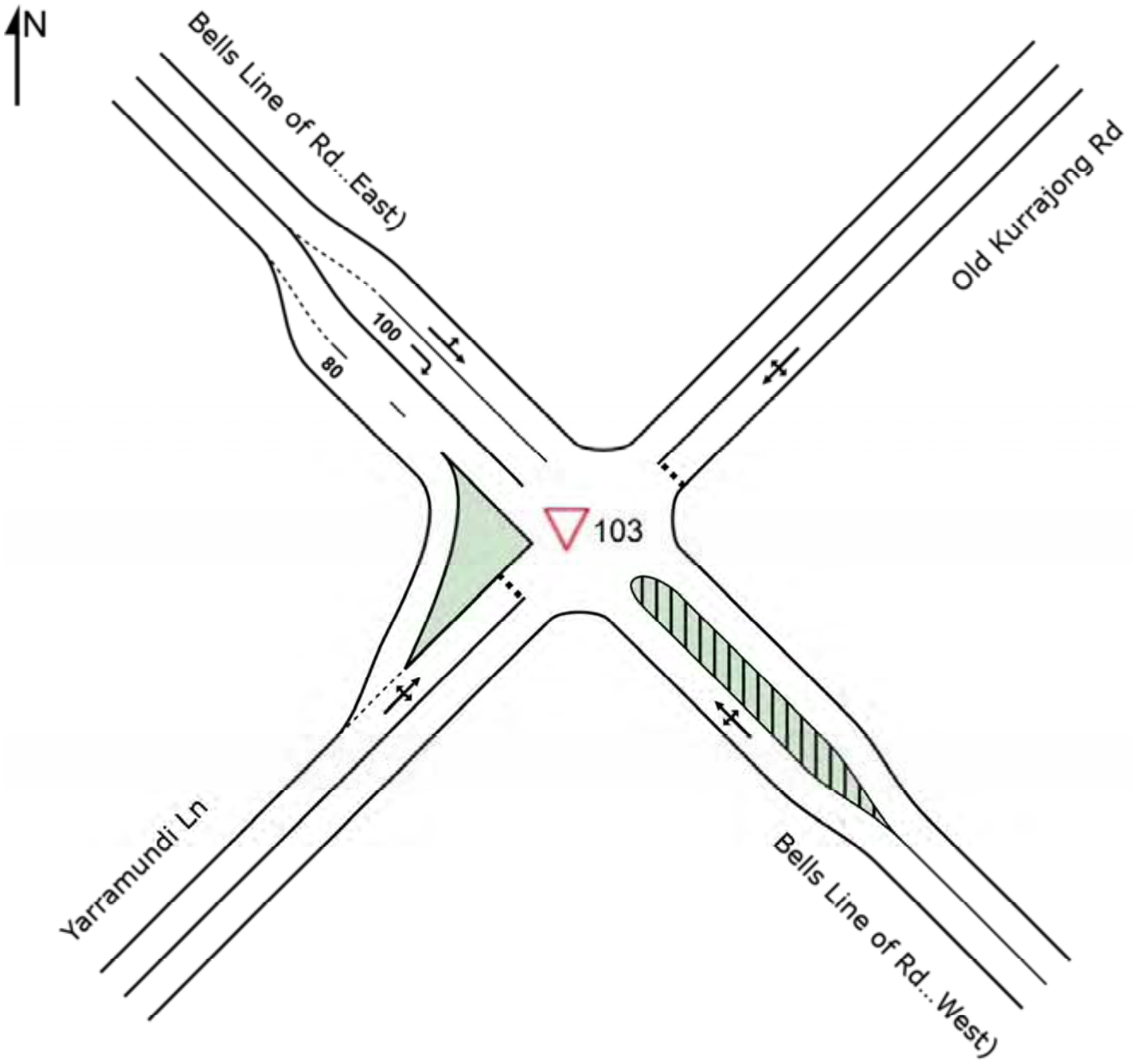
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	56.2	LOS E	0.1	0.1	0.95	0.95
P2	NorthEast Full Crossing	21	27.1	LOS C	0.0	0.0	0.66	0.66
P3	NorthWest Full Crossing	21	48.8	LOS E	0.1	0.1	0.89	0.89
P4	SouthWest Full Crossing	21	27.1	LOS C	0.0	0.0	0.66	0.66
All Pedestrians		84	39.8	LOS D			0.79	0.79

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 103 [2018AM BC Yarramundi Ln/ Bells Line of Rd -with new bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:22:12 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 103 [2018AM BC Yarramundi Ln/ Bells Line of Rd -with new bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bells Line of Rd (West)												
4	L2	2	0.0	0.312	24.2	LOS B	0.2	1.5	0.02	0.00	0.02	59.1
5	T1	556	11.4	0.312	0.2	LOS A	0.2	1.5	0.02	0.00	0.02	59.8
6	R2	1	100.0	0.312	29.9	LOS C	0.2	1.5	0.02	0.00	0.02	57.5
Approach		559	11.5	0.312	0.4	NA	0.2	1.5	0.02	0.00	0.02	59.8
NorthEast: Old Kurrajong Rd												
7	L2	2	0.0	0.044	9.3	LOS A	0.1	0.8	0.89	0.92	0.89	47.8
8	T1	1	0.0	0.044	39.6	LOS C	0.1	0.8	0.89	0.92	0.89	41.2
9	R2	2	0.0	0.044	51.0	LOS D	0.1	0.8	0.89	0.92	0.89	43.6
Approach		5	0.0	0.044	32.1	LOS C	0.1	0.8	0.89	0.92	0.89	45.3
NorthWest: Bells Line of Rd (East)												
10	L2	186	0.6	0.663	5.8	LOS A	0.0	0.0	0.00	0.09	0.00	58.0
11	T1	1059	3.9	0.663	0.3	LOS A	0.0	0.0	0.00	0.09	0.00	59.3
12	R2	357	4.1	0.336	8.3	LOS A	1.9	14.1	0.62	0.80	0.68	53.8
Approach		1602	3.5	0.663	2.7	NA	1.9	14.1	0.14	0.25	0.15	58.3
SouthWest: Yarramundi Ln												
1	L2	242	8.3	0.160	9.0	LOS A	0.7	5.2	0.09	0.48	0.09	54.3
2	T1	1	0.0	0.160	54.2	LOS D	0.7	5.2	0.09	0.48	0.09	52.6
3	R2	1	0.0	0.160	43.4	LOS D	0.7	5.2	0.09	0.48	0.09	55.2
Approach		244	8.2	0.160	9.3	NA	0.7	5.2	0.09	0.48	0.09	54.3
All Vehicles		2411	5.9	0.663	2.9	NA	1.9	14.1	0.11	0.22	0.12	58.4

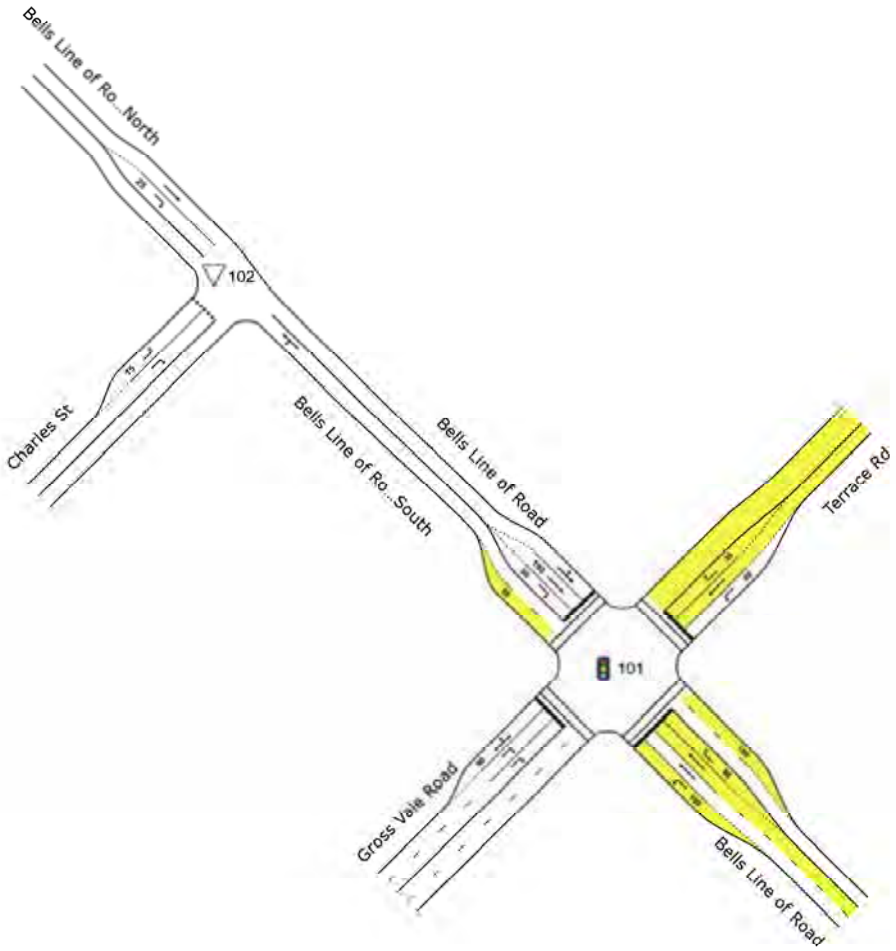
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N101 [2027AM BC With Bridge 8-9am]

New Network
Network Category: (None)

N



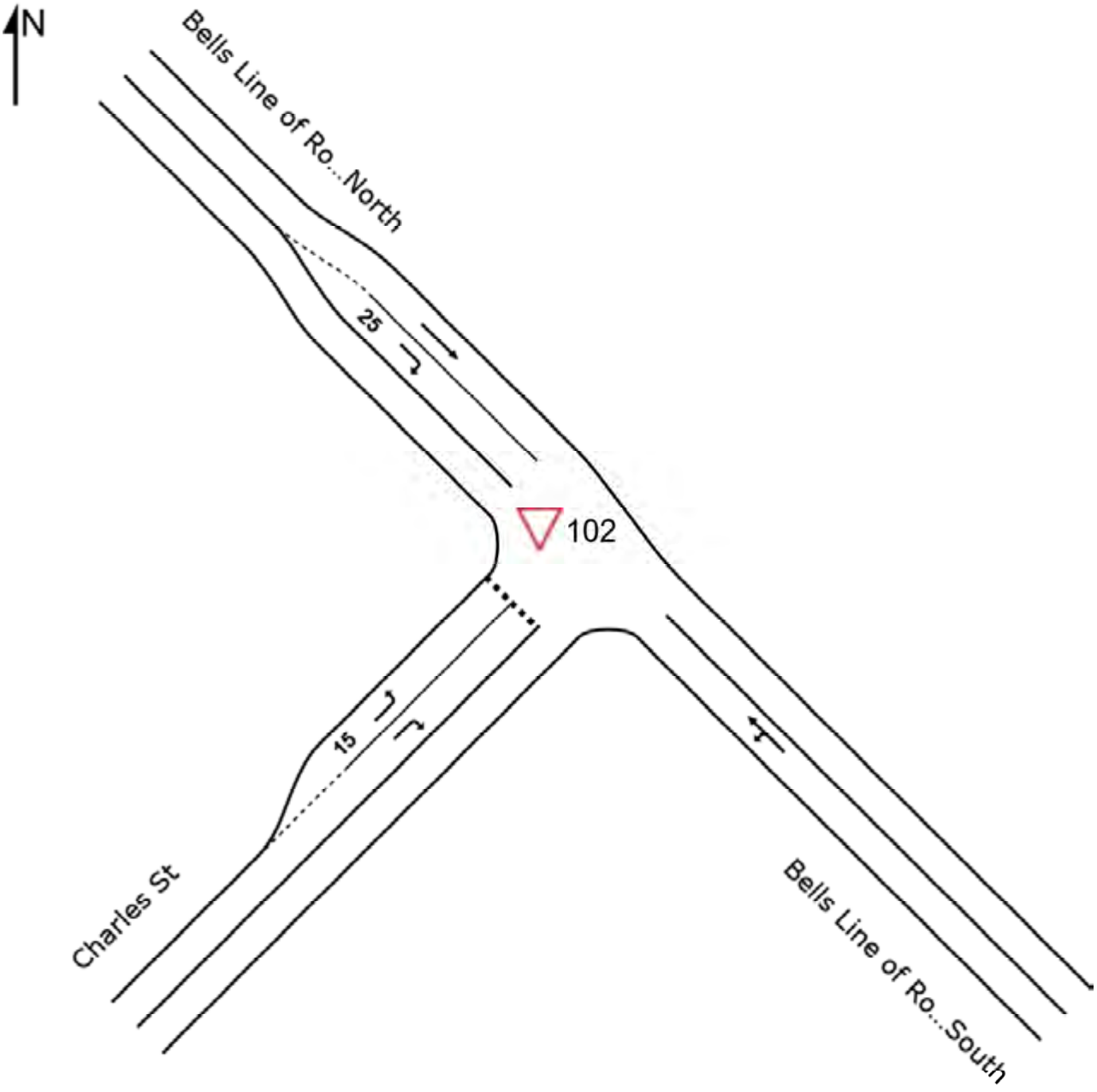
SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽102	NA	2027AM BC Charles St/ Bells Line of Rd -with new bridge 8-9am
101	NA	2027AM BC Bells Line of Road/Gross Vale Road/Terrace Rd-with new bridge 8-9am

Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:03:19 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

SITE LAYOUT

Site: 102 [2027AM BC Charles St/ Bells Line of Rd -with new bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:04:32 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 102 [2027AM BC Charles St/ Bells Line of Rd -with new bridge 8-9am]

Network: N101 [2027AM BC With Bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

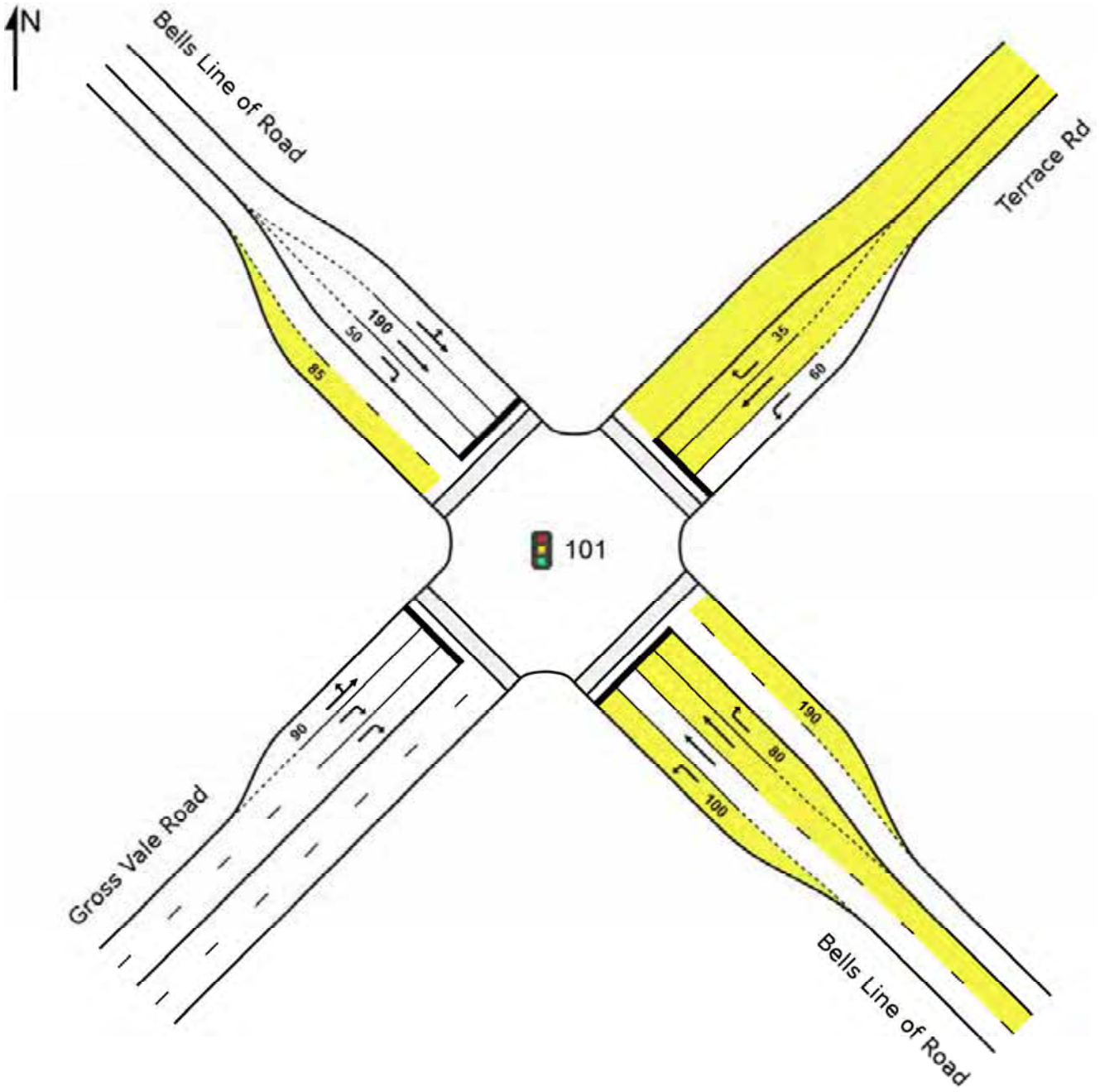
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road South														
1	L2	1	5.0	1	5.0	0.266	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	54.9
2	T1	480	5.0	480	5.0	0.266	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		481	5.0	481	5.0	0.266	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
NorthWest: Bells Line of Road North														
8	T1	964	5.0	964	5.0	0.536	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
9	R2	197	5.0	197	5.0	0.171	7.4	LOS A	0.3	2.4	0.51	0.69	0.51	47.3
Approach		1161	5.0	1161	5.0	0.536	1.3	NA	0.3	2.4	0.09	0.12	0.09	56.7
SouthWest: Charles St														
10	L2	215	5.0	215	5.0	0.203	6.4	LOS A	0.4	2.6	0.49	0.68	0.49	47.4
12	R2	59	5.0	59	5.0	0.397	32.6	LOS C	0.5	3.8	0.91	1.02	1.12	12.2
Approach		274	5.0	274	5.0	0.397	12.1	LOS A	0.5	3.8	0.58	0.75	0.63	40.6
All Vehicles		1916	5.0	1916	5.0	0.536	2.5	NA	0.5	3.8	0.14	0.18	0.14	54.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2027AM BC Bells Line of Road/Gross Vale Road/Terrace Rd-with new bridge 8-9am]

Site Category: (None)
Signals - Fixed Time Isolated



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:04:56 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 101 [2027AM BC Bells Line of Road/Gross Vale Road/ Terrace Rd-with new bridge 8-9am]

Network: N101 [2027AM BC With Bridge 8-9am]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road														
1	L2	191	12.0	191	12.0	0.202	10.9	LOS A	1.4	10.7	0.49	0.70	0.49	45.3
2	T1	445	6.0	445	6.0	0.516	28.4	LOS B	7.3	53.4	0.83	0.70	0.83	31.4
3	R2	120	10.0	120	10.0	0.824	61.9	LOS E	4.0	30.5	1.00	0.94	1.35	29.4
Approach		756	8.1	756	8.1	0.824	29.3	LOS C	7.3	53.4	0.77	0.74	0.83	33.7
NorthEast: Terrace Rd														
4	L2	188	3.0	188	3.0	0.740	31.6	LOS C	3.3	23.4	1.00	0.86	1.13	38.8
5	T1	16	2.5	16	2.5	0.126	49.5	LOS D	0.5	3.3	0.97	0.67	0.97	28.0
6	R2	7	7.0	7	7.0	0.064	54.7	LOS D	0.2	1.6	0.96	0.66	0.96	21.8
Approach		212	3.1	212	3.1	0.740	33.7	LOS C	3.3	23.4	1.00	0.84	1.11	37.4
NorthWest: Bells Line of Road														
7	L2	32	0.0	32	0.0	0.845	45.7	LOS D	15.8	113.0	0.99	0.99	1.14	30.8
8	T1	973	3.0	973	3.0	0.845	40.3	LOS C	15.8	113.0	0.99	0.99	1.14	31.5
9	R2	16	0.0	16	0.0	0.101	52.4	LOS D	0.5	3.2	0.95	0.69	0.95	19.8
Approach		1020	2.9	1020	2.9	0.845	40.6	LOS C	15.8	113.0	0.99	0.98	1.14	31.3
SouthWest: Gross Vale Road														
10	L2	28	4.0	28	4.0	0.158	34.1	LOS C	1.8	12.5	0.78	0.66	0.78	18.1
11	T1	51	0.0	51	0.0	0.158	28.5	LOS C	1.8	12.5	0.78	0.66	0.78	35.2
12	R2	787	3.0	787	3.0	0.859	52.3	LOS D	13.0	93.1	1.00	0.97	1.22	26.7
Approach		866	2.9	866	2.9	0.859	50.3	LOS D	13.0	93.1	0.98	0.94	1.18	27.0
All Vehicles		2854	4.3	2854	4.3	0.859	40.1	LOS C	15.8	113.0	0.93	0.89	1.07	30.9

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

Movement Performance - Pedestrians

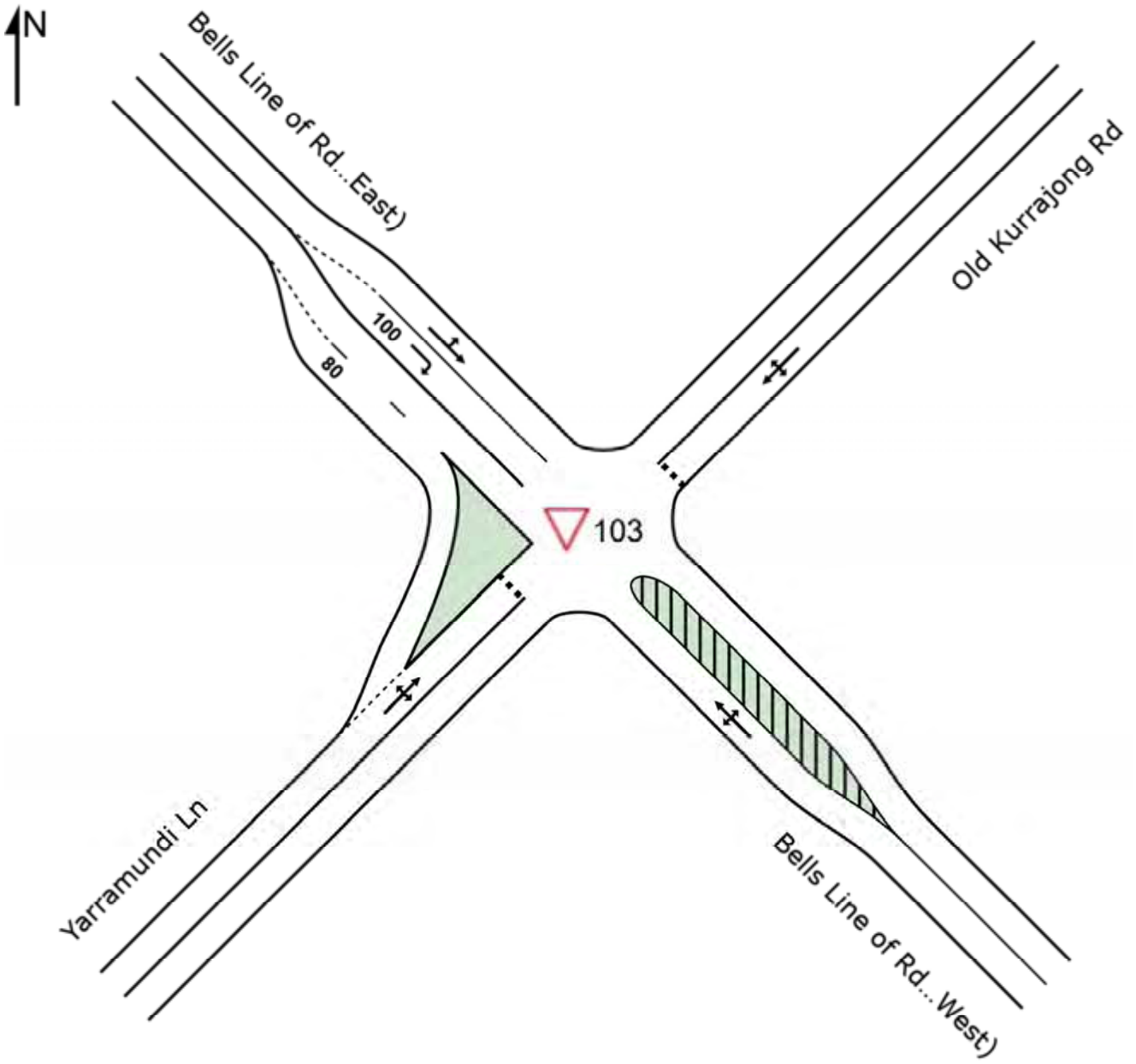
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	30.4	LOS D	0.0	0.0	0.78	0.78
P3	NorthWest Full Crossing	21	36.2	LOS D	0.1	0.1	0.85	0.85
P4	SouthWest Full Crossing	21	31.2	LOS D	0.0	0.0	0.79	0.79
All Pedestrians		84	35.5	LOS D			0.84	0.84

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 103 [2027AM BC Yarramundi Ln/ Bells Line of Rd -with new bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:22:47 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 103 [2027AM BC Yarramundi Ln/ Bells Line of Rd -with new bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)

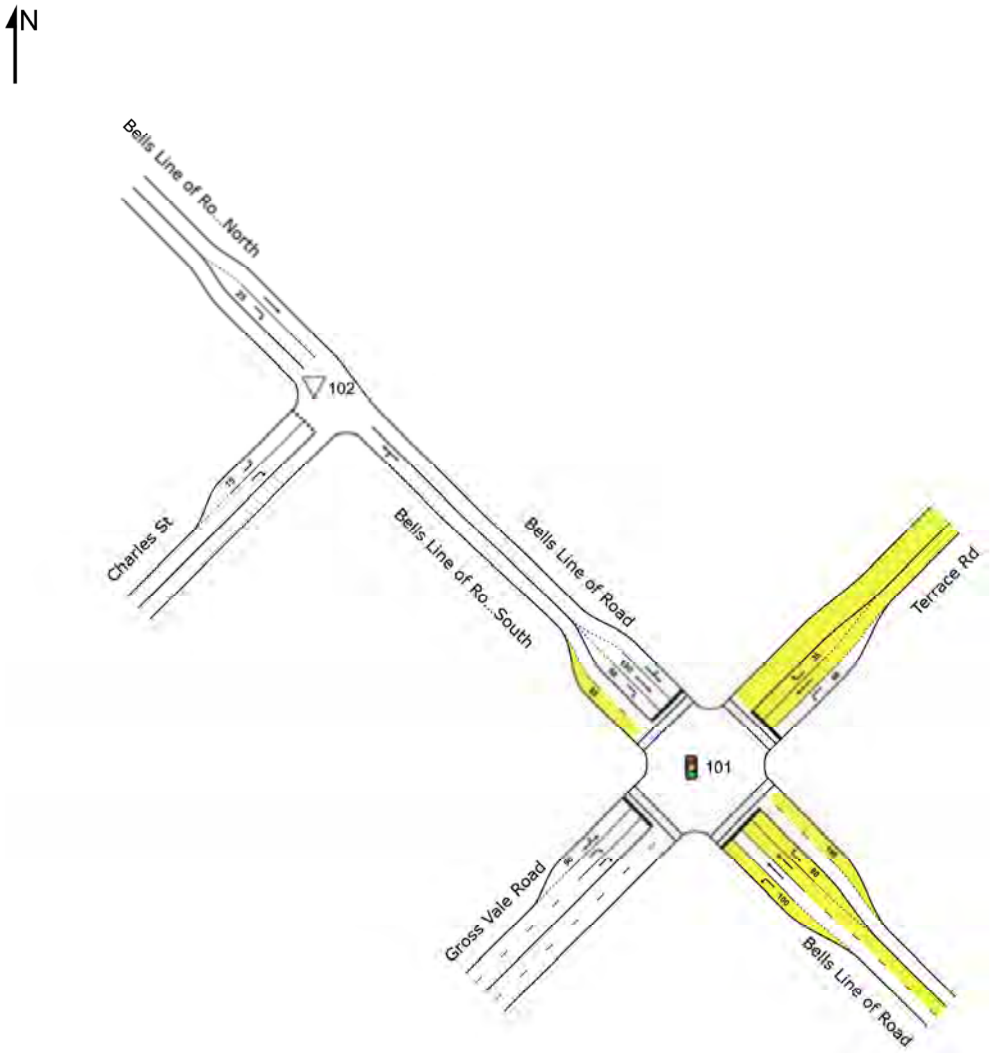
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bells Line of Rd (West)												
4	L2	1	2.0	0.309	15.0	LOS B	0.1	0.5	0.01	0.00	0.01	59.1
5	T1	589	2.0	0.309	0.1	LOS A	0.1	0.5	0.01	0.00	0.01	59.9
6	R2	1	2.0	0.309	17.3	LOS B	0.1	0.5	0.01	0.00	0.01	58.8
Approach		592	2.0	0.309	0.1	NA	0.1	0.5	0.01	0.00	0.01	59.9
NorthEast: Old Kurrajong Rd												
7	L2	1	2.0	0.151	13.0	LOS A	0.4	2.9	0.96	0.98	0.96	39.8
8	T1	4	2.0	0.151	66.9	LOS E	0.4	2.9	0.96	0.98	0.96	31.3
9	R2	3	2.0	0.151	81.8	LOS F	0.4	2.9	0.96	0.98	0.96	34.4
Approach		8	2.0	0.151	65.8	LOS E	0.4	2.9	0.96	0.98	0.96	33.8
NorthWest: Bells Line of Rd (East)												
10	L2	98	2.0	0.829	6.2	LOS A	0.0	0.0	0.00	0.04	0.00	57.9
11	T1	1481	2.0	0.829	0.7	LOS A	0.0	0.0	0.00	0.04	0.00	59.1
12	R2	399	2.0	0.372	8.5	LOS A	2.3	16.7	0.63	0.83	0.75	53.7
Approach		1978	2.0	0.829	2.6	NA	2.3	16.7	0.13	0.20	0.15	58.3
SouthWest: Yarramundi Ln												
1	L2	199	2.0	0.244	39.3	LOS C	11.3	80.3	1.00	0.04	1.08	41.5
2	T1	6	2.0	0.244	84.5	LOS F	11.3	80.3	1.00	0.04	1.08	38.2
3	R2	1	2.0	0.244	73.8	LOS F	11.3	80.3	1.00	0.04	1.08	45.3
Approach		206	2.0	0.244	40.9	NA	11.3	80.3	1.00	0.04	1.08	41.4
All Vehicles		2784	2.0	0.829	5.1	NA	11.3	80.3	0.17	0.15	0.19	57.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N101 [2027AM S1 Without Bridge 8-9am]

New Network
Network Category: (None)



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽102	NA	2027AM S1 Charles St/ Bells Line of Rd -without new bridge 8-9am
101	NA	2027AM S1 Bells Line of Road/Gross Vale Road/Terrace Rd-without new bridge 8-9am

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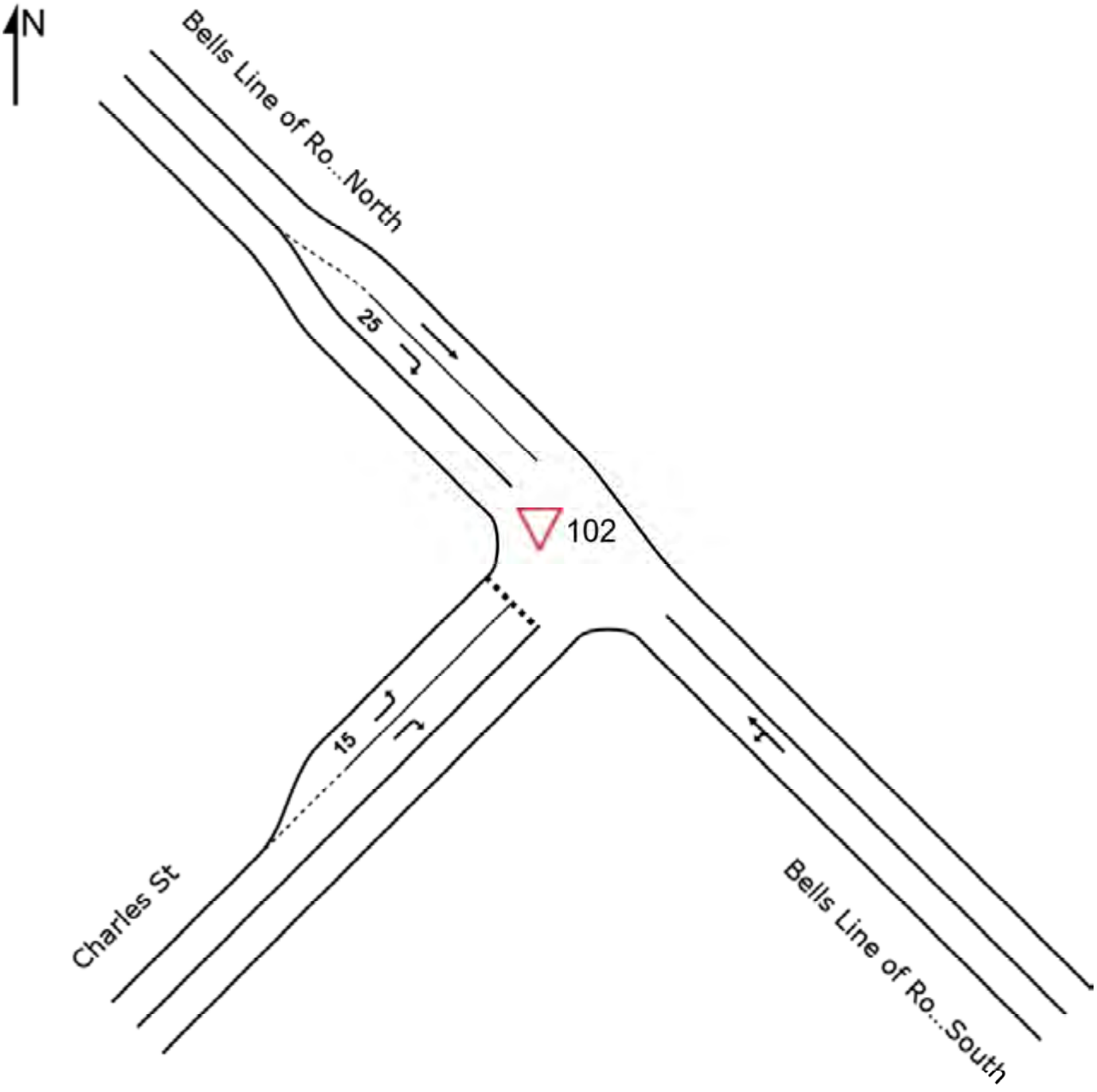
SITE LAYOUT

Site: 102 [2027AM S1 Charles St/ Bells Line of Rd -without new bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)



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Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 102 [2027AM S1 Charles St/ Bells Line of Rd -without new bridge 8-9am]

Network: N101 [2027AM S1 Without Bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

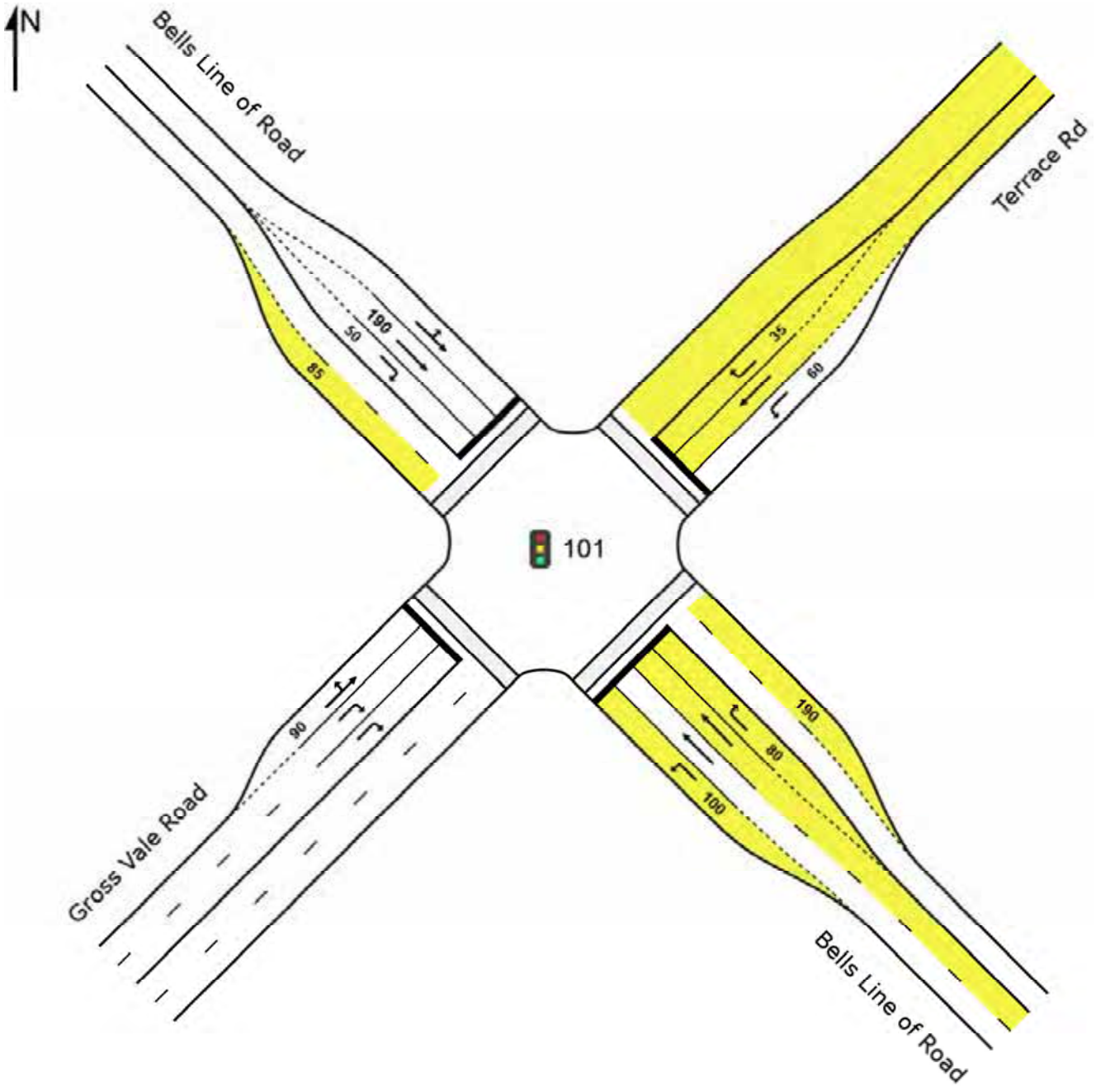
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road South														
1	L2	3	5.0	3	5.0	0.288	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	54.8
2	T1	518	5.0	518	5.0	0.288	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		521	5.0	521	5.0	0.288	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
NorthWest: Bells Line of Road North														
8	T1	987	5.0	987	5.0	0.843	0.7	LOS A	0.0	0.0	0.00	0.00	0.00	58.6
9	R2	174	5.0	174	5.0	0.157	7.5	LOS A	0.3	2.1	0.52	0.70	0.52	47.2
Approach		1161	5.0	1161	5.0	0.843	1.7	NA	0.3	2.1	0.08	0.10	0.08	56.1
SouthWest: Charles St														
10	L2	211	5.0	211	5.0	0.205	6.6	LOS A	0.4	2.6	0.51	0.69	0.51	47.4
12	R2	144	5.0	144	5.0	1.566	551.5	LOS F	14.6	106.9	1.00	4.41	13.32	0.9
Approach		355	5.0	355	5.0	1.566	228.1	LOS F	14.6	106.9	0.71	2.20	5.72	6.1
All Vehicles		2037	5.0	2037	5.0	1.566	40.7	NA	14.6	106.9	0.17	0.44	1.04	26.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2027AM S1 Bells Line of Road/Gross Vale Road/Terrace Rd-without new bridge 8-9am]

Site Category: (None)
Signals - Fixed Time Isolated



Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 101 [2027AM S1 Bells Line of Road/Gross Vale Road/ Terrace Rd-without new bridge 8-9am]

Network: N101 [2027AM S1 Without Bridge 8-9am]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bells Line of Road														
1	L2	298	12.0	298	12.0	0.306	10.8	LOS A	2.2	17.1	0.51	0.72	0.51	45.4
2	T1	502	6.0	502	6.0	0.640	31.8	LOS C	8.8	64.9	0.89	0.75	0.89	29.7
3	R2	127	10.0	127	10.0	0.983	88.7	LOS F	5.3	40.3	1.00	1.16	1.90	24.2
Approach		927	8.5	927	8.5	0.983	32.9	LOS C	8.8	64.9	0.78	0.80	0.91	32.0
NorthEast: Terrace Rd														
4	L2	147	3.0	147	3.0	0.668	31.0	LOS C	2.5	17.9	1.00	0.82	1.07	39.0
5	T1	15	2.5	15	2.5	0.137	50.9	LOS D	0.4	3.2	0.98	0.67	0.98	27.6
6	R2	7	7.0	7	7.0	0.074	56.3	LOS D	0.2	1.6	0.97	0.66	0.97	21.4
Approach		169	3.1	169	3.1	0.668	33.8	LOS C	2.5	17.9	1.00	0.80	1.06	37.3
NorthWest: Bells Line of Road														
7	L2	45	0.0	43	0.0	1.011	98.0	LOS F	26.7	191.4	1.00	1.41	1.72	19.2
8	T1	1102	3.0	1055	3.0	1.011	92.6	LOS F	26.7	191.4	1.00	1.41	1.72	19.4
9	R2	7	0.0	7	0.0	0.051	53.0	LOS D	0.2	1.4	0.95	0.66	0.95	19.6
Approach		1155	2.9	1106[N1]	2.9	1.011	92.6	LOS F	26.7	191.4	1.00	1.41	1.72	19.4
SouthWest: Gross Vale Road														
10	L2	12	4.0	12	4.0	0.096	30.4	LOS C	1.1	8.1	0.72	0.59	0.72	20.3
11	T1	44	0.0	44	0.0	0.096	24.8	LOS B	1.1	8.1	0.72	0.59	0.72	37.5
12	R2	1098	3.0	1098	3.0	1.018	102.8	LOS F	27.7	198.7	1.00	1.22	1.77	17.5
Approach		1154	2.9	1154	2.9	1.018	99.1	LOS F	27.7	198.7	0.99	1.19	1.72	17.9
All Vehicles		3405	4.4	3356[N1]	4.5	1.018	75.4	LOS F	27.7	198.7	0.93	1.13	1.46	21.6

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	32.8	LOS D	0.0	0.0	0.81	0.81
P3	NorthWest Full Crossing	21	32.0	LOS D	0.0	0.0	0.80	0.80
P4	SouthWest Full Crossing	21	33.6	LOS D	0.0	0.0	0.82	0.82

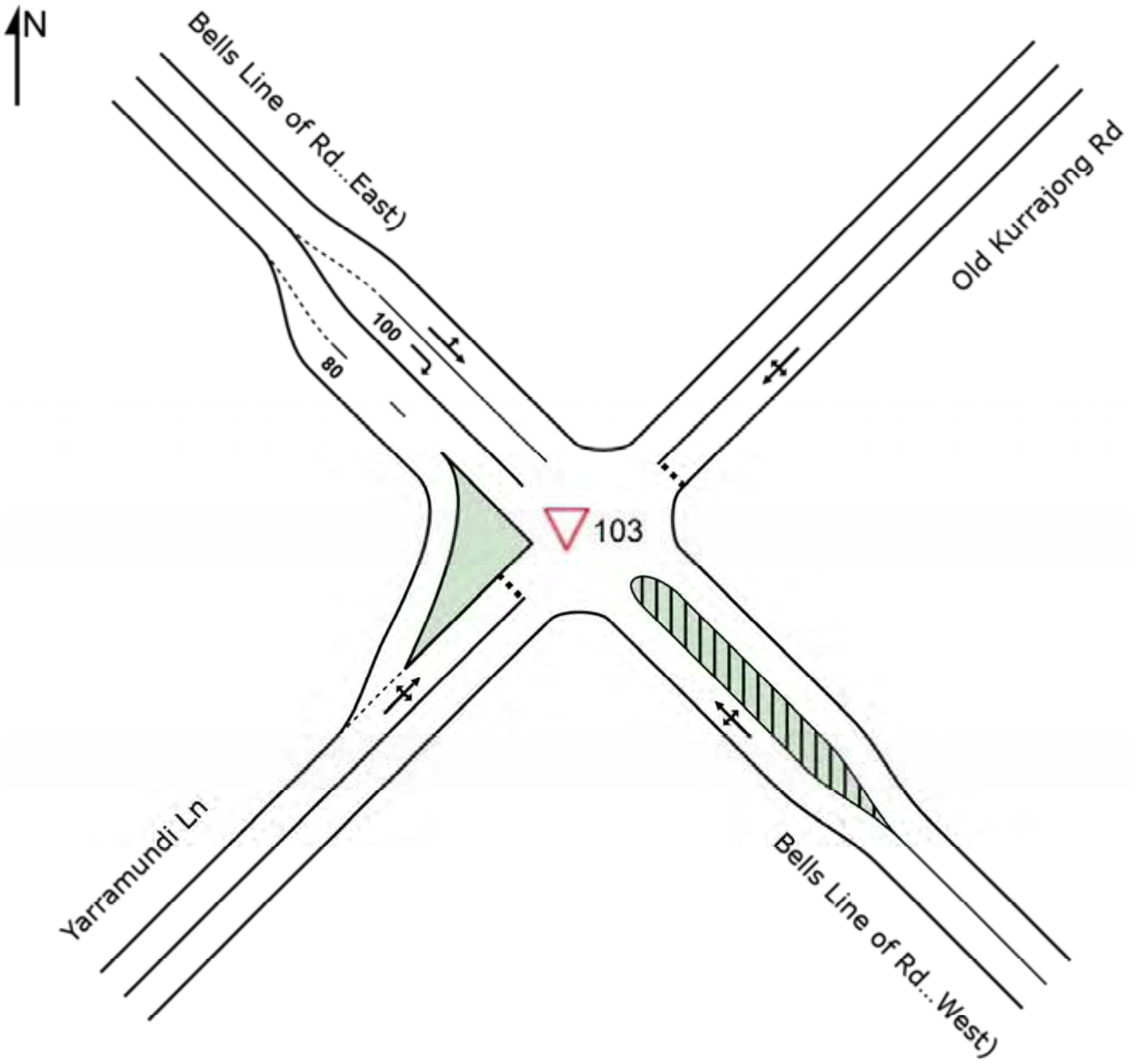
All Pedestrians	84	35.7	LOS D	0.84	0.84

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 103 [2027AM S1 Yarramundi Ln/ Bells Line of Rd -without new bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)



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Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 103 [2027AM S1 Yarramundi Ln/ Bells Line of Rd -without new bridge 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)

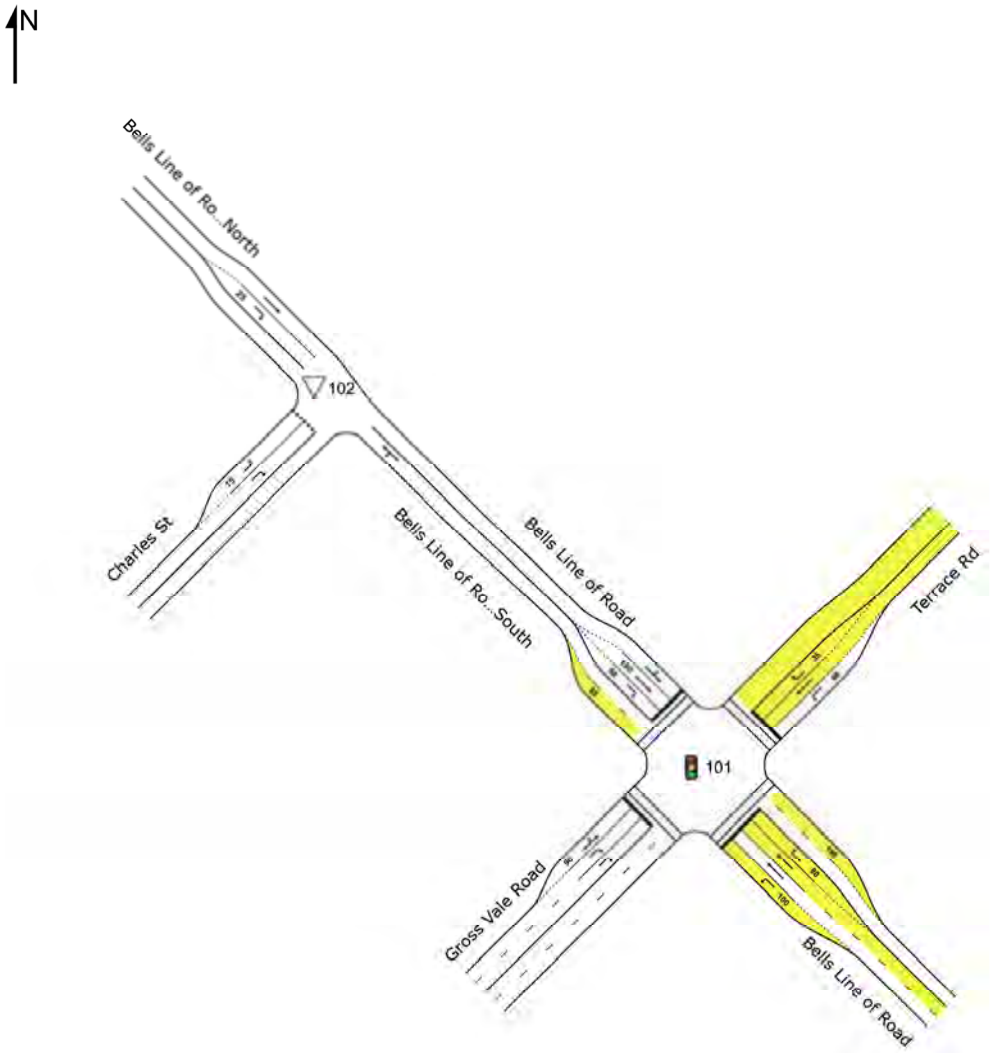
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bells Line of Rd (West)												
4	L2	1	2.0	0.355	11.3	LOS A	0.0	0.3	0.01	0.00	0.01	59.2
5	T1	679	2.0	0.355	0.0	LOS A	0.0	0.3	0.01	0.00	0.01	60.0
6	R2	1	2.0	0.355	13.4	LOS A	0.0	0.3	0.01	0.00	0.01	58.9
Approach		681	2.0	0.355	0.1	NA	0.0	0.3	0.01	0.00	0.01	60.0
NorthEast: Old Kurrajong Rd												
7	L2	1	2.0	0.169	15.0	LOS B	0.4	3.2	0.97	0.99	0.99	34.3
8	T1	4	2.0	0.169	107.5	LOS F	0.4	3.2	0.97	0.99	0.99	25.5
9	R2	1	2.0	0.169	141.4	LOS F	0.4	3.2	0.97	0.99	0.99	28.6
Approach		6	2.0	0.169	97.8	LOS F	0.4	3.2	0.97	0.99	0.99	27.9
NorthWest: Bells Line of Rd (East)												
10	L2	118	2.0	0.760	6.0	LOS A	0.0	0.0	0.00	0.05	0.00	58.1
11	T1	1329	2.0	0.760	0.5	LOS A	0.0	0.0	0.00	0.05	0.00	59.3
12	R2	845	2.0	0.606	10.3	LOS A	7.9	56.5	0.83	1.06	1.37	52.8
Approach		2293	2.0	0.760	4.4	NA	7.9	56.5	0.31	0.42	0.51	57.4
SouthWest: Yarramundi Ln												
1	L2	268	2.0	0.308	56.5	LOS D	23.4	166.9	1.00	0.02	1.11	36.7
2	T1	4	2.0	0.308	143.3	LOS F	23.4	166.9	1.00	0.02	1.11	33.3
3	R2	1	2.0	0.308	121.1	LOS F	23.4	166.9	1.00	0.02	1.11	41.3
Approach		274	2.0	0.308	58.1	NA	23.4	166.9	1.00	0.02	1.11	36.7
All Vehicles		3254	2.0	0.760	8.2	NA	23.4	166.9	0.30	0.30	0.45	56.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N101 [2027AM S2 Kurrajong+Kurmond 8-9am]

New Network
Network Category: (None)



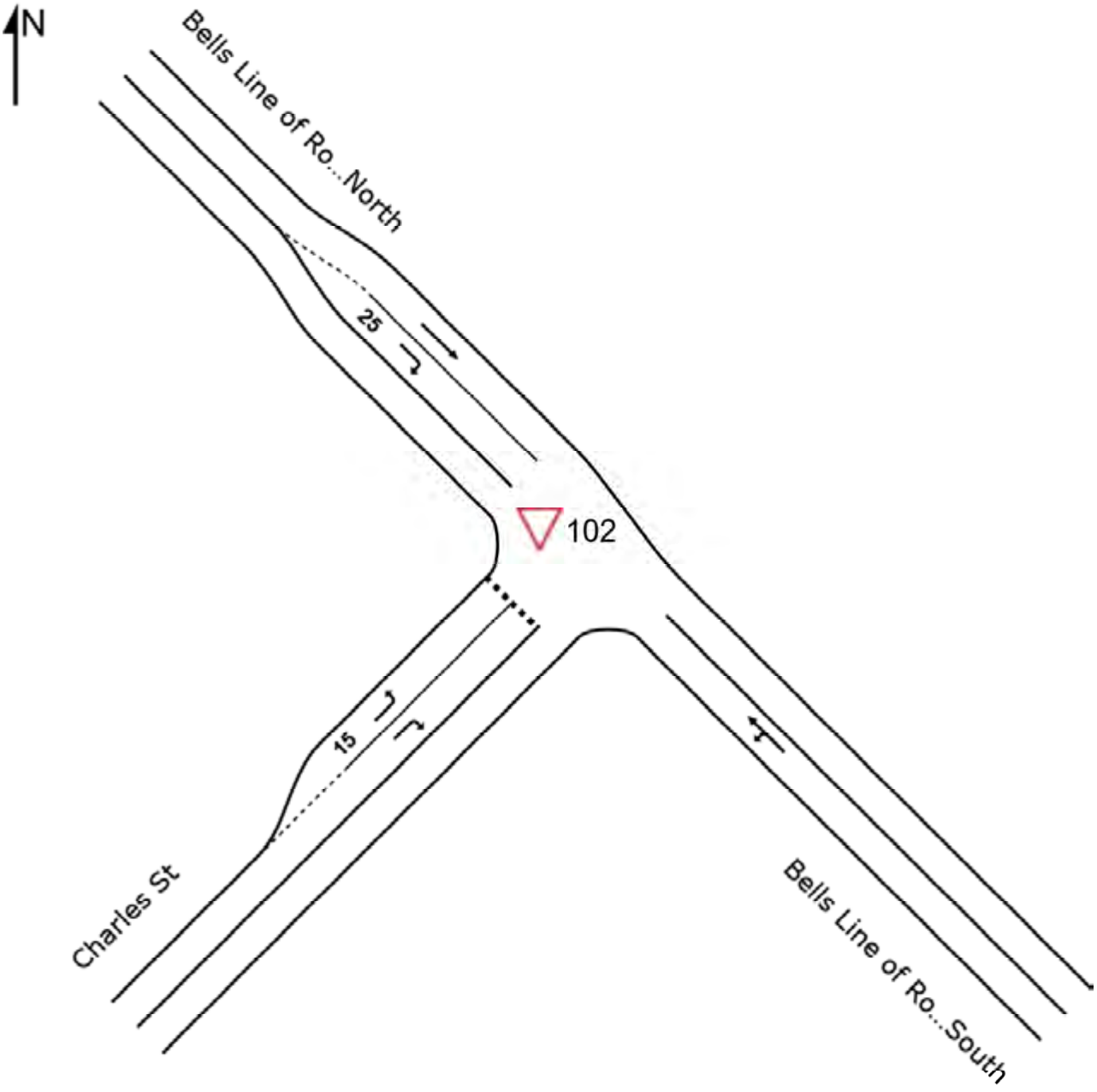
SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽102	NA	2027AM S2 Charles St/ Bells Line of Rd -Kurrajong+Kurmond
101	NA	2027AM S2 Bells Line of Road/Gross Vale Road/Terrace Rd -Kurrajong+ Kurmond

Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:06:49 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

SITE LAYOUT

Site: 102 [2027AM S2 Charles St/ Bells Line of Rd -Kurrajong+Kurmond]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:07:30 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 102 [2027AM S2 Charles St/ Bells Line of Rd -Kurrajong +Kurmond]

Network: N101 [2027AM S2 Kurrajong+Kurmond 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)

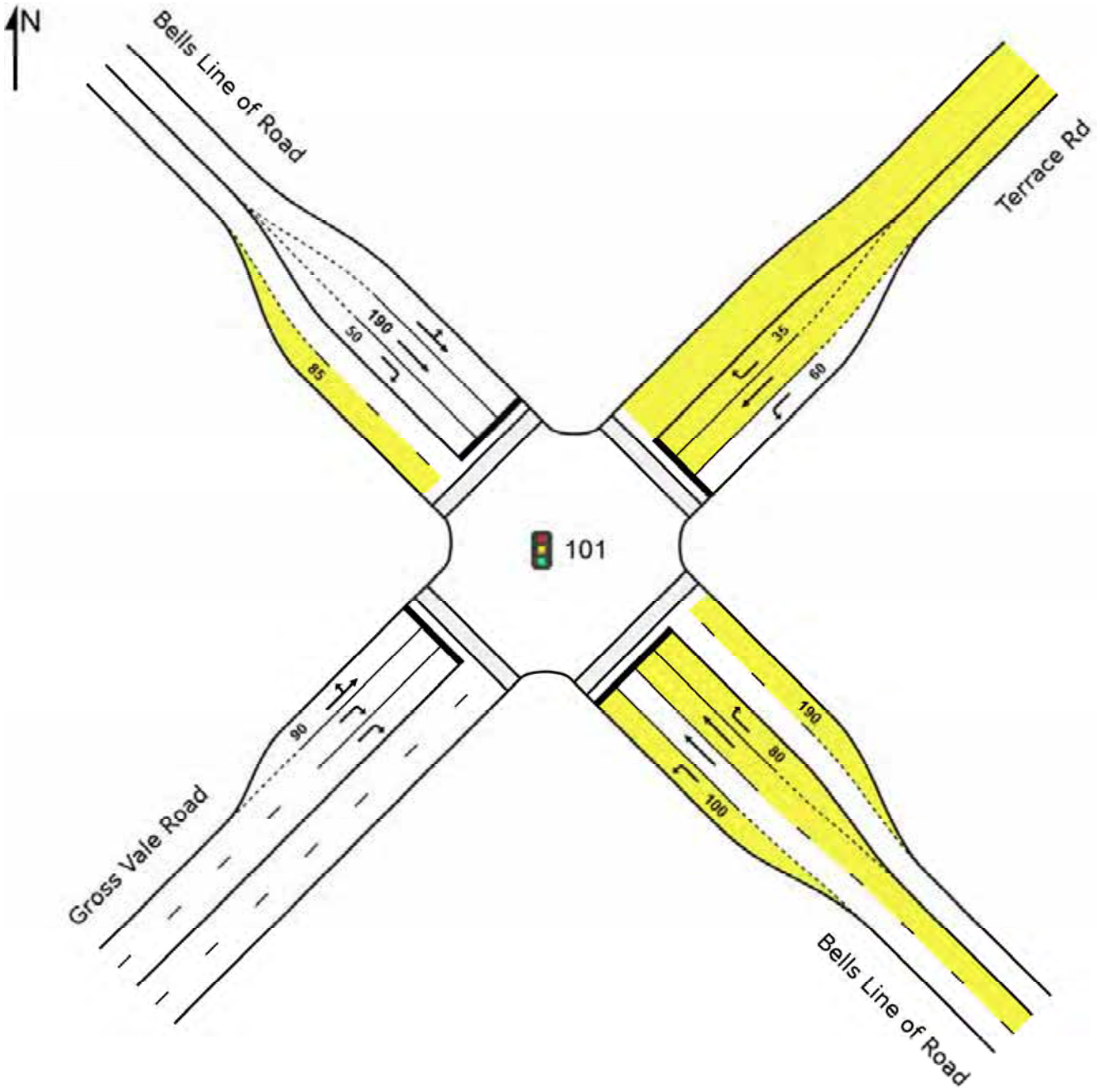
Movement Performance - Vehicles														
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road South														
1	L2	5	5.0	5	5.0	0.272	5.6	LOS A	0.0	0.0	0.00	0.01	0.00	54.8
2	T1	486	5.0	486	5.0	0.272	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.9
Approach		492	5.0	492	5.0	0.272	0.1	NA	0.0	0.0	0.00	0.01	0.00	59.8
NorthWest: Bells Line of Road North														
8	T1	985	5.0	985	5.0	0.608	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
9	R2	202	5.0	202	5.0	0.178	7.4	LOS A	0.3	2.5	0.52	0.69	0.52	47.2
Approach		1187	5.0	1187	5.0	0.608	1.4	NA	0.3	2.5	0.09	0.12	0.09	56.6
SouthWest: Charles St														
10	L2	209	5.0	209	5.0	0.199	6.4	LOS A	0.3	2.5	0.50	0.68	0.50	47.4
12	R2	43	5.0	43	5.0	0.337	32.3	LOS C	0.4	2.8	0.90	1.00	1.05	12.3
Approach		253	5.0	253	5.0	0.337	10.9	LOS A	0.4	2.8	0.56	0.73	0.59	42.1
All Vehicles		1932	5.0	1932	5.0	0.608	2.3	NA	0.4	2.8	0.13	0.17	0.13	55.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2027AM S2 Bells Line of Road/Gross Vale Road/Terrace Rd -Kurrajong+ Kurmond]

Site Category: (None)
Signals - Fixed Time Isolated



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:07:52 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 101 [2027AM S2 Bells Line of Road/Gross Vale Road/ Terrace Rd -Kurrajong+ Kurmond]

Network: N101 [2027AM S2 Kurrajong+Kurmond 8-9am]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road														
1	L2	188	12.0	188	12.0	0.214	12.0	LOS A	1.6	12.5	0.54	0.71	0.54	44.4
2	T1	438	6.0	438	6.0	0.558	31.0	LOS C	7.5	54.9	0.87	0.73	0.87	30.1
3	R2	191	10.0	191	10.0	0.905	67.1	LOS E	6.9	52.1	1.00	1.03	1.50	28.2
Approach		817	8.3	817	8.3	0.905	35.0	LOS C	7.5	54.9	0.82	0.80	0.94	31.8
NorthEast: Terrace Rd														
4	L2	208	3.0	208	3.0	0.646	27.6	LOS B	3.2	22.8	0.97	0.82	0.99	40.5
5	T1	17	2.5	17	2.5	0.134	49.5	LOS D	0.5	3.6	0.97	0.68	0.97	28.0
6	R2	7	7.0	7	7.0	0.064	54.7	LOS D	0.2	1.6	0.96	0.66	0.96	21.8
Approach		233	3.1	233	3.1	0.646	30.0	LOS C	3.2	22.8	0.97	0.80	0.99	39.0
NorthWest: Bells Line of Road														
7	L2	34	0.0	34	0.0	0.947	67.8	LOS E	20.3	145.8	1.00	1.20	1.43	24.6
8	T1	991	3.0	991	3.0	0.947	62.5	LOS E	20.3	145.8	1.00	1.20	1.44	24.9
9	R2	16	0.0	16	0.0	0.070	47.6	LOS D	0.4	3.0	0.91	0.69	0.91	21.0
Approach		1040	2.9	1040	2.9	0.947	62.4	LOS E	20.3	145.8	1.00	1.19	1.43	24.9
SouthWest: Gross Vale Road														
10	L2	46	4.0	46	4.0	0.172	34.2	LOS C	1.9	13.6	0.78	0.69	0.78	17.6
11	T1	39	0.0	39	0.0	0.172	28.6	LOS C	1.9	13.6	0.78	0.69	0.78	34.6
12	R2	806	3.0	806	3.0	0.913	61.8	LOS E	14.7	105.9	1.00	1.03	1.37	24.3
Approach		892	2.9	892	2.9	0.913	58.9	LOS E	14.7	105.9	0.98	1.00	1.31	24.5
All Vehicles		2981	4.4	2981	4.4	0.947	51.3	LOS D	20.3	145.8	0.94	0.99	1.23	27.3

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

Movement Performance - Pedestrians

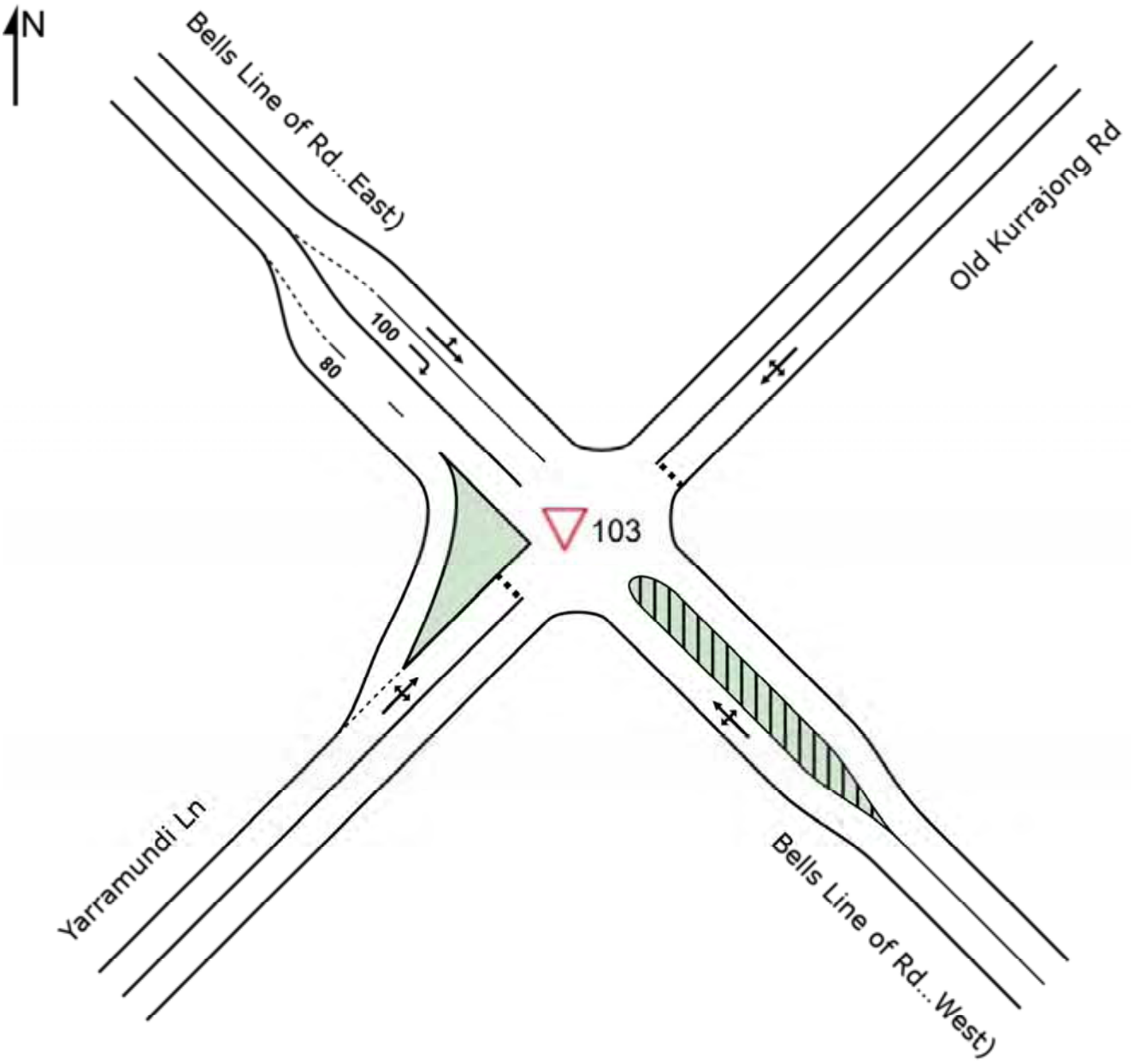
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	32.8	LOS D	0.0	0.0	0.81	0.81
P3	NorthWest Full Crossing	21	37.0	LOS D	0.1	0.1	0.86	0.86
P4	SouthWest Full Crossing	21	33.6	LOS D	0.0	0.0	0.82	0.82
All Pedestrians		84	36.9	LOS D			0.86	0.86

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 103 [2027AM S2 Yarramundi Ln/ Bells Line of Rd -Kurrajong+Kurmond 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:23:53 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 103 [2027AM S2 Yarramundi Ln/ Bells Line of Rd -Kurrajong+Kurmond 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)

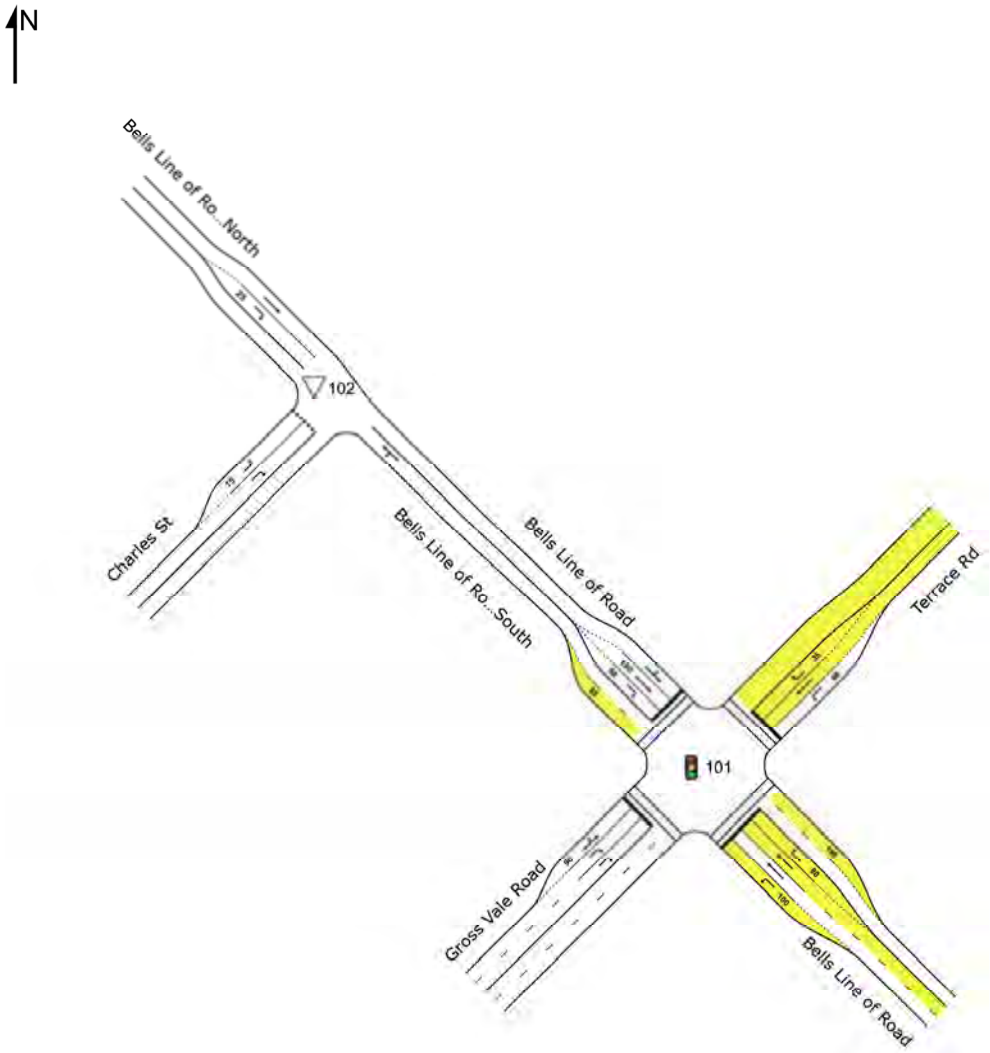
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bells Line of Rd (West)												
4	L2	1	2.0	0.322	15.7	LOS B	0.1	0.5	0.01	0.00	0.01	59.1
5	T1	614	2.0	0.322	0.1	LOS A	0.1	0.5	0.01	0.00	0.01	59.9
6	R2	1	2.0	0.322	18.1	LOS B	0.1	0.5	0.01	0.00	0.01	58.8
Approach		616	2.0	0.322	0.1	NA	0.1	0.5	0.01	0.00	0.01	59.9
NorthEast: Old Kurrajong Rd												
7	L2	1	2.0	0.138	12.5	LOS A	0.4	2.6	0.96	0.98	0.96	39.4
8	T1	4	2.0	0.138	70.6	LOS F	0.4	2.6	0.96	0.98	0.96	30.8
9	R2	2	2.0	0.138	90.0	LOS F	0.4	2.6	0.96	0.98	0.96	33.9
Approach		7	2.0	0.138	67.8	LOS E	0.4	2.6	0.96	0.98	0.96	33.3
NorthWest: Bells Line of Rd (East)												
10	L2	86	2.0	0.850	6.3	LOS A	0.0	0.0	0.00	0.03	0.00	57.8
11	T1	1533	2.0	0.850	0.8	LOS A	0.0	0.0	0.00	0.03	0.00	59.0
12	R2	391	2.0	0.371	8.6	LOS A	2.3	16.6	0.64	0.85	0.76	53.7
Approach		2009	2.0	0.850	2.6	NA	2.3	16.6	0.12	0.19	0.15	58.2
SouthWest: Yarramundi Ln												
1	L2	235	2.0	0.253	36.3	LOS C	14.0	99.4	1.00	0.03	1.08	42.5
2	T1	5	2.0	0.253	92.2	LOS F	14.0	99.4	1.00	0.03	1.08	39.3
3	R2	1	2.0	0.253	81.4	LOS F	14.0	99.4	1.00	0.03	1.08	46.1
Approach		241	2.0	0.253	37.7	NA	14.0	99.4	1.00	0.03	1.08	42.4
All Vehicles		2874	2.0	0.850	5.2	NA	14.0	99.4	0.18	0.14	0.20	57.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N101 [2027AM S3 5% Town Centre Growth 8-9am]

New Network
Network Category: (None)



SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽102	NA	2027AM S3 Charles St/ Bells Line of Rd -5% Town Centre Growth
101	NA	2027AM S3 Bells Line of Road/Gross Vale Road/Terrace Rd -5% Town Centre Growth

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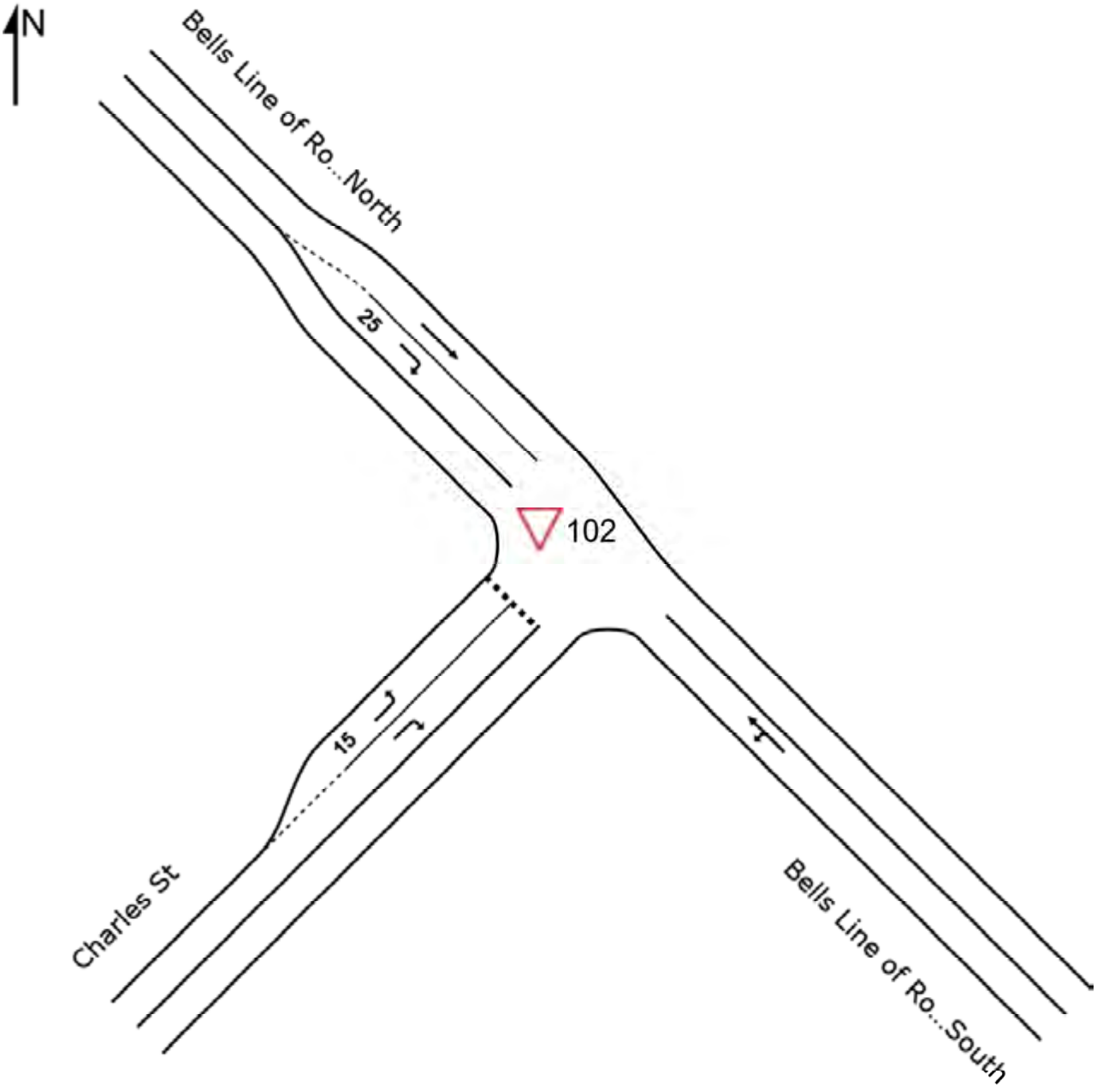
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

SITE LAYOUT

Site: 102 [2027AM S3 Charles St/ Bells Line of Rd -5% Town Centre Growth]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:09:05 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 102 [2027AM S3 Charles St/ Bells Line of Rd -5% Town Centre Growth]

Network: N101 [2027AM S3 5% Town Centre Growth 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

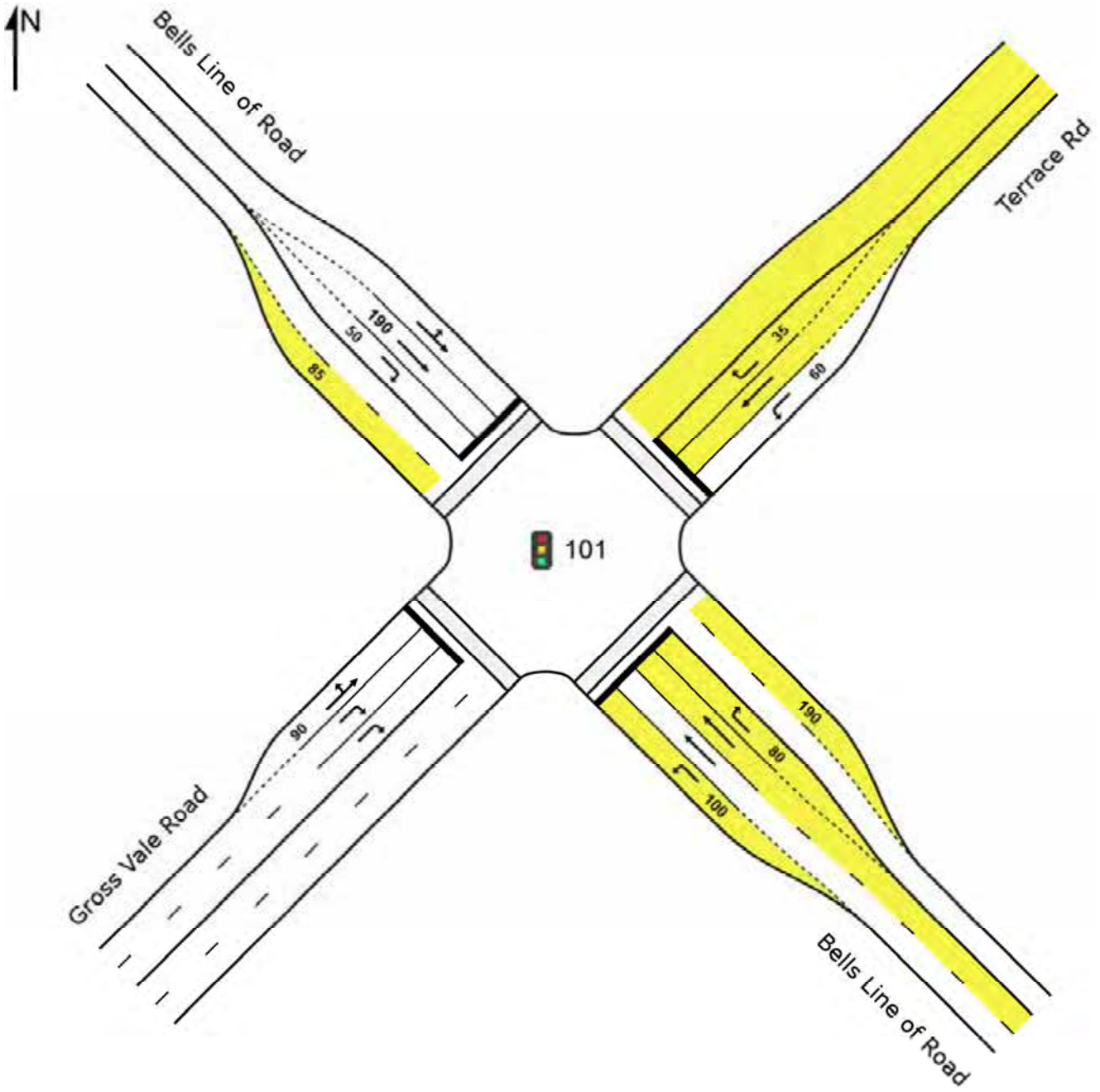
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road South														
1	L2	2	5.0	2	5.0	0.286	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	54.9
2	T1	516	5.0	516	5.0	0.286	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		518	5.0	518	5.0	0.286	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
NorthWest: Bells Line of Road North														
8	T1	1001	5.0	1001	5.0	0.556	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
9	R2	187	5.0	187	5.0	0.169	7.5	LOS A	0.3	2.3	0.53	0.70	0.53	47.2
Approach		1188	5.0	1188	5.0	0.556	1.3	NA	0.3	2.3	0.08	0.11	0.08	56.9
SouthWest: Charles St														
10	L2	182	5.0	182	5.0	0.177	6.5	LOS A	0.3	2.2	0.50	0.68	0.50	47.4
12	R2	40	5.0	40	5.0	0.291	32.2	LOS C	0.4	2.6	0.90	0.99	1.02	12.3
Approach		222	5.0	222	5.0	0.291	11.1	LOS A	0.4	2.6	0.57	0.74	0.59	41.8
All Vehicles		1928	5.0	1928	5.0	0.556	2.1	NA	0.4	2.6	0.12	0.15	0.12	55.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2027AM S3 Bells Line of Road/Gross Vale Road/Terrace Rd -5% Town Centre Growth]

Site Category: (None)
Signals - Fixed Time Isolated



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:09:28 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 101 [2027AM S3 Bells Line of Road/Gross Vale Road/ Terrace Rd -5% Town Centre Growth]

Network: N101 [2027AM S3 5% Town Centre Growth 8-9am]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road														
1	L2	207	12.0	207	12.0	0.228	11.5	LOS A	1.6	12.3	0.52	0.71	0.52	44.9
2	T1	458	6.0	458	6.0	0.531	28.5	LOS B	7.5	55.3	0.84	0.71	0.84	31.3
3	R2	144	10.0	144	10.0	0.891	66.5	LOS E	5.1	38.7	1.00	1.02	1.50	28.3
Approach		809	8.2	809	8.2	0.891	30.9	LOS C	7.5	55.3	0.78	0.76	0.87	33.1
NorthEast: Terrace Rd														
4	L2	218	3.0	218	3.0	0.755	31.2	LOS C	3.9	27.8	1.00	0.87	1.13	38.9
5	T1	9	2.5	9	2.5	0.066	47.6	LOS D	0.3	1.9	0.95	0.64	0.95	28.6
6	R2	6	7.0	6	7.0	0.048	53.2	LOS D	0.2	1.3	0.95	0.66	0.95	22.2
Approach		234	3.1	234	3.1	0.755	32.5	LOS C	3.9	27.8	1.00	0.86	1.12	38.1
NorthWest: Bells Line of Road														
7	L2	40	0.0	40	0.0	0.873	49.2	LOS D	17.2	123.0	1.00	1.04	1.20	29.6
8	T1	1003	3.0	1003	3.0	0.873	43.9	LOS D	17.2	123.0	1.00	1.04	1.20	30.2
9	R2	7	0.0	7	0.0	0.042	50.5	LOS D	0.2	1.4	0.93	0.66	0.93	20.2
Approach		1051	2.9	1051	2.9	0.873	44.1	LOS D	17.2	123.0	1.00	1.04	1.20	30.1
SouthWest: Gross Vale Road														
10	L2	54	4.0	54	4.0	0.186	34.4	LOS C	2.0	14.6	0.79	0.70	0.79	17.4
11	T1	37	0.0	37	0.0	0.186	28.8	LOS C	2.0	14.6	0.79	0.70	0.79	34.4
12	R2	760	3.0	760	3.0	0.895	58.8	LOS E	13.4	96.2	1.00	1.01	1.32	25.1
Approach		851	2.9	851	2.9	0.895	56.0	LOS D	13.4	96.2	0.98	0.97	1.27	25.1
All Vehicles		2944	4.4	2944	4.4	0.895	43.0	LOS D	17.2	123.0	0.93	0.93	1.12	29.8

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

Movement Performance - Pedestrians

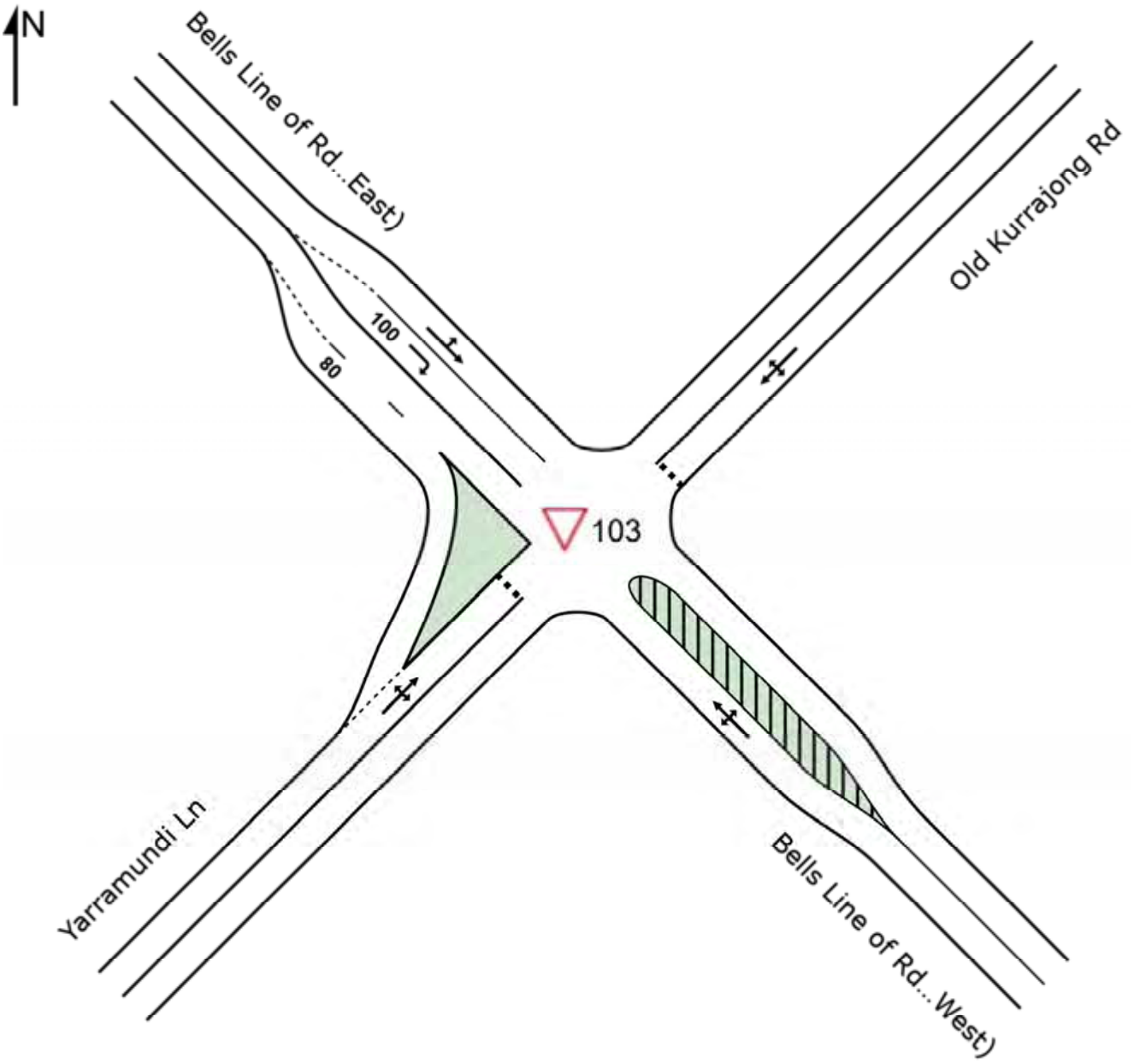
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	30.4	LOS D	0.0	0.0	0.78	0.78
P3	NorthWest Full Crossing	21	37.9	LOS D	0.1	0.1	0.87	0.87
P4	SouthWest Full Crossing	21	31.2	LOS D	0.0	0.0	0.79	0.79
All Pedestrians		84	35.9	LOS D			0.85	0.85

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 103 [2027AM S3 Yarramundi Ln/ Bells Line of Rd -5% Town Centre Growth 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:24:32 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 103 [2027AM S3 Yarramundi Ln/ Bells Line of Rd -5% Town Centre Growth 8-9am]

Site Category: (None)
Giveway / Yield (Two-Way)

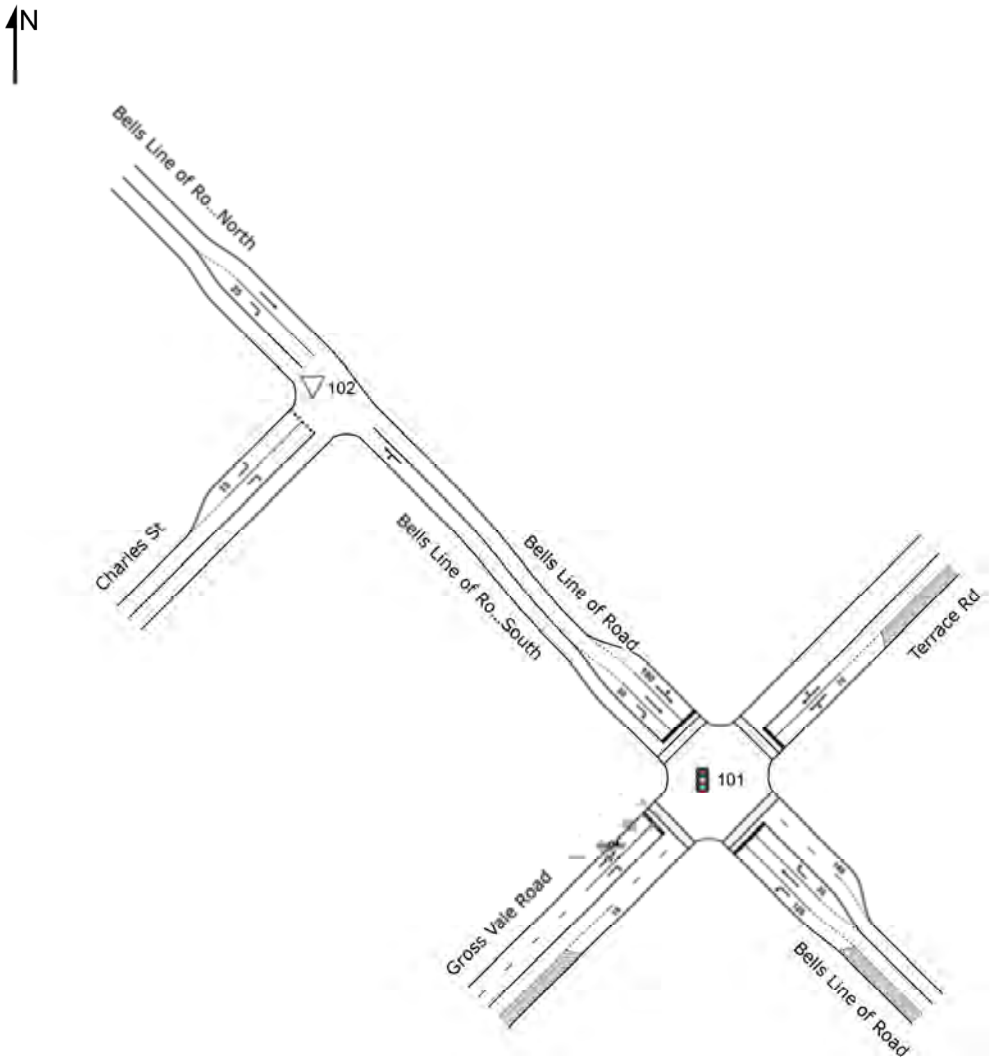
Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bells Line of Rd (West)												
4	L2	1	2.0	0.330	15.7	LOS B	0.1	0.5	0.01	0.00	0.01	59.1
5	T1	629	2.0	0.330	0.1	LOS A	0.1	0.5	0.01	0.00	0.01	59.9
6	R2	1	2.0	0.330	18.1	LOS B	0.1	0.5	0.01	0.00	0.01	58.8
Approach		632	2.0	0.330	0.1	NA	0.1	0.5	0.01	0.00	0.01	59.9
NorthEast: Old Kurrajong Rd												
7	L2	1	2.0	0.186	16.3	LOS B	0.5	3.6	0.96	0.99	0.99	38.1
8	T1	5	2.0	0.186	75.1	LOS F	0.5	3.6	0.96	0.99	0.99	29.4
9	R2	3	2.0	0.186	93.9	LOS F	0.5	3.6	0.96	0.99	0.99	32.5
Approach		9	2.0	0.186	74.8	LOS F	0.5	3.6	0.96	0.99	0.99	31.7
NorthWest: Bells Line of Rd (East)												
10	L2	96	2.0	0.846	6.3	LOS A	0.0	0.0	0.00	0.04	0.00	57.8
11	T1	1514	2.0	0.846	0.8	LOS A	0.0	0.0	0.00	0.04	0.00	59.0
12	R2	391	2.0	0.377	8.8	LOS A	2.4	17.0	0.65	0.86	0.78	53.6
Approach		2000	2.0	0.846	2.6	NA	2.4	17.0	0.13	0.20	0.15	58.2
SouthWest: Yarramundi Ln												
1	L2	228	2.0	0.229	32.6	LOS C	13.4	95.7	1.00	0.02	1.06	43.8
2	T1	4	2.0	0.229	92.0	LOS F	13.4	95.7	1.00	0.02	1.06	40.7
3	R2	1	2.0	0.229	80.4	LOS F	13.4	95.7	1.00	0.02	1.06	47.2
Approach		234	2.0	0.229	33.8	NA	13.4	95.7	1.00	0.02	1.06	43.8
All Vehicles		2875	2.0	0.846	4.9	NA	13.4	95.7	0.17	0.14	0.20	57.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

NETWORK LAYOUT

Network: N101 [2018PM BC With Bridge 15-16pm]

New Network
Network Category: (None)



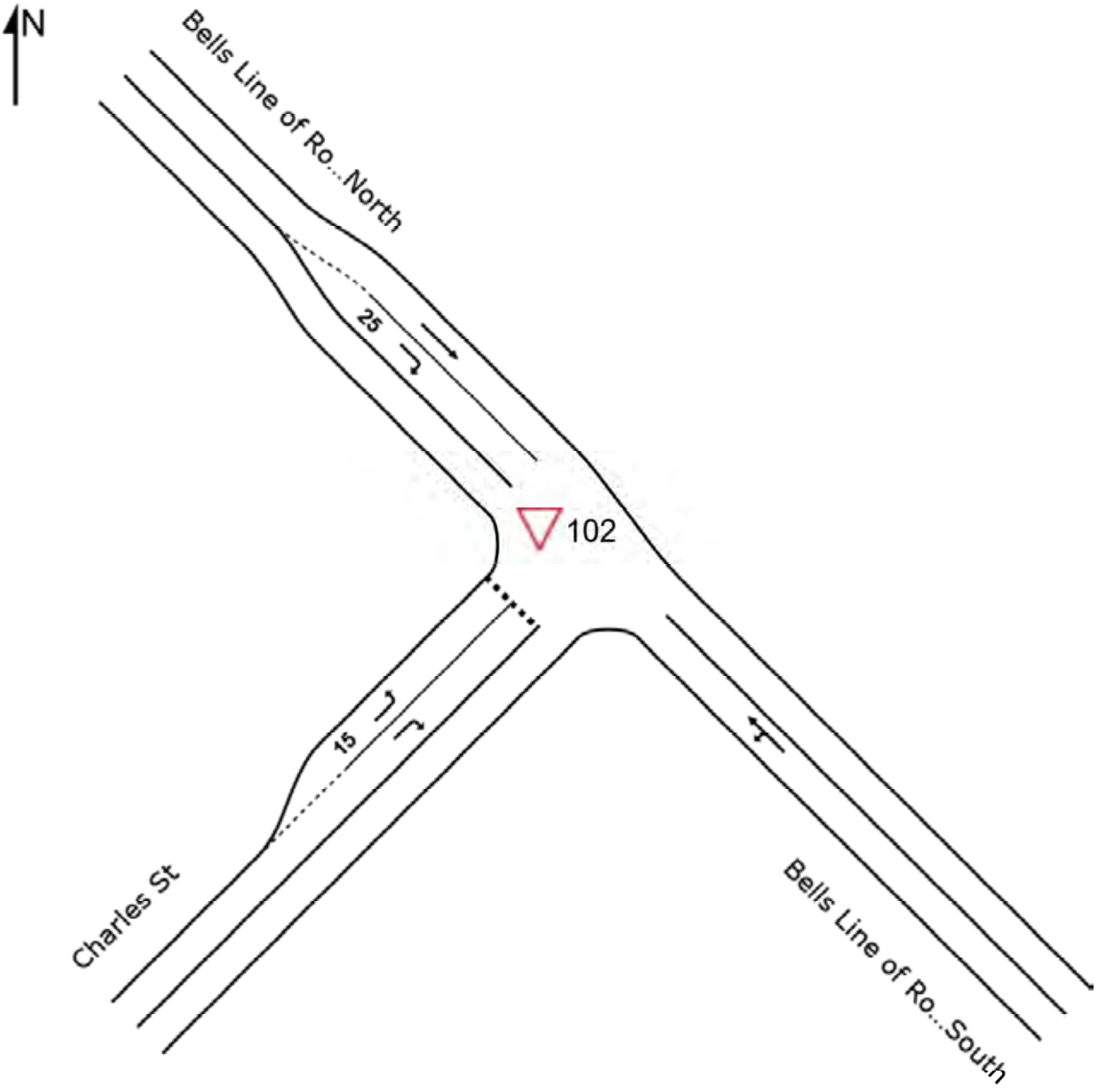
SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽102	NA	2018PM BC Charles St/ Bells Line of Rd -with new bridge 15-16pm
101	NA	2018PM BC Bells Line of Road/Gross Vale Road/Terrace Rd-with new bridge 15-16pm

Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:09:56 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

SITE LAYOUT

Site: 102 [2018PM BC Charles St/ Bells Line of Rd -with new bridge 15-16pm]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:10:33 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 102 [2018PM BC Charles St/ Bells Line of Rd -with new bridge 15-16pm]

Network: N101 [2018PM BC With Bridge 15-16pm]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

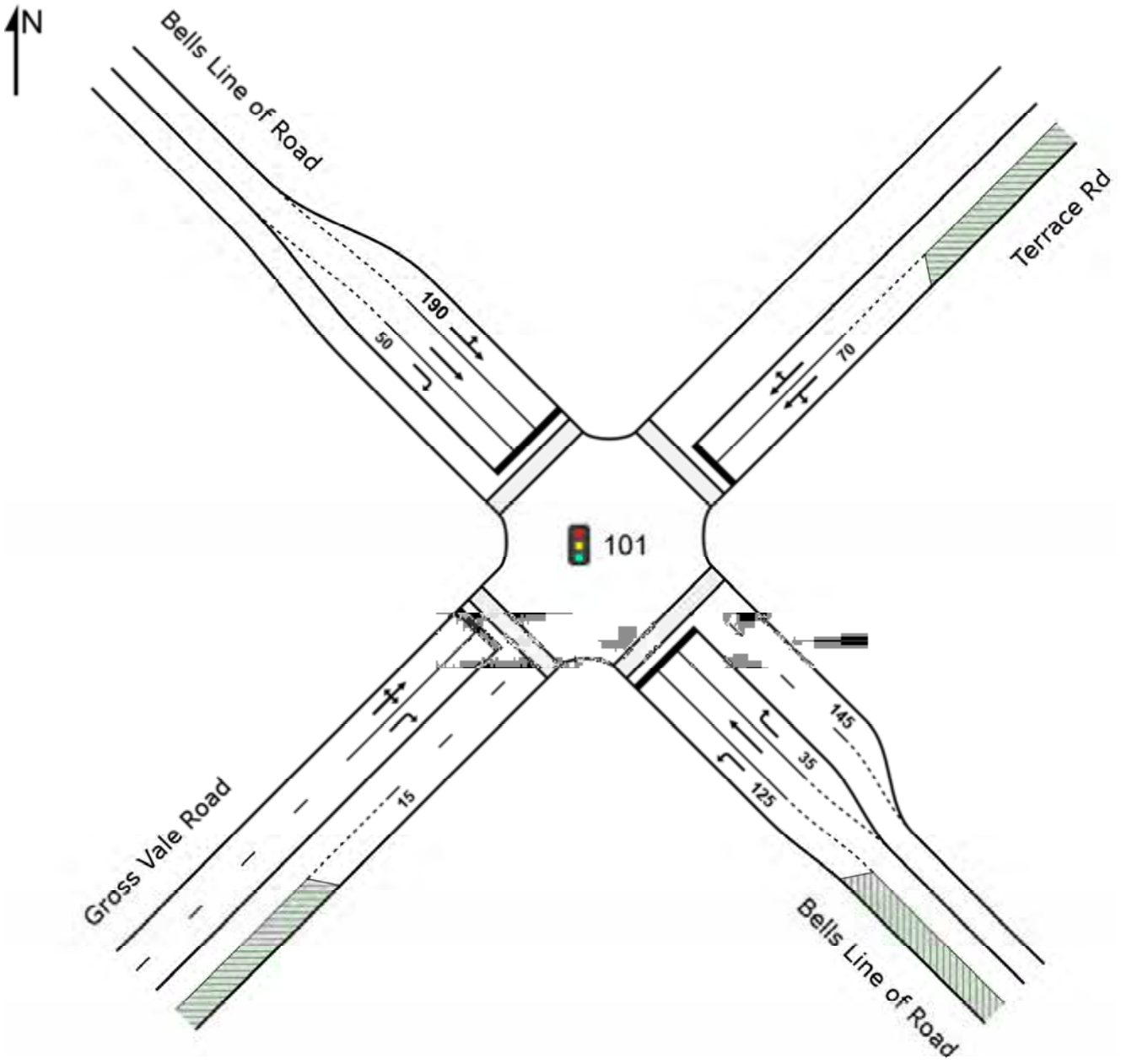
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road South														
1	L2	48	6.5	48	6.5	0.464	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	53.9
2	T1	779	7.0	779	7.0	0.464	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	59.4
Approach		827	7.0	827	7.0	0.464	0.4	NA	0.0	0.0	0.00	0.03	0.00	59.2
NorthWest: Bells Line of Road North														
8	T1	605	6.3	605	6.3	0.339	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	62	6.8	62	6.8	0.075	8.9	LOS A	0.1	0.9	0.59	0.76	0.59	46.0
Approach		667	6.3	667	6.3	0.339	0.9	NA	0.1	0.9	0.06	0.07	0.06	57.9
SouthWest: Charles St														
10	L2	123	6.8	123	6.8	0.154	7.8	LOS A	0.2	1.8	0.58	0.77	0.58	46.2
12	R2	15	7.1	15	7.1	0.084	22.6	LOS B	0.1	0.7	0.84	0.93	0.84	15.9
Approach		138	6.9	138	6.9	0.154	9.4	LOS A	0.2	1.8	0.60	0.79	0.60	44.0
All Vehicles		1633	6.7	1633	6.7	0.464	1.3	NA	0.2	1.8	0.07	0.11	0.07	57.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2018PM BC Bells Line of Road/Gross Vale Road/Terrace Rd-with new bridge 15-16pm]

Site Category: (None)
Signals - Fixed Time Isolated



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:10:54 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 101 [2018PM BC Bells Line of Road/Gross Vale Road/ Terrace Rd-with new bridge 15-16pm]

Network: N101 [2018PM BC With Bridge 15-16pm]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road														
1	L2	87	12.0	87	12.0	0.068	8.3	LOS A	0.6	5.0	0.22	0.63	0.22	47.5
2	T1	692	7.6	692	7.6	0.965	61.1	LOS E	28.4	211.8	0.75	0.99	1.14	20.2
3	R2	193	3.3	193	3.3	0.360	21.1	LOS B	3.3	23.8	0.73	0.77	0.73	43.6
Approach		972	7.2	972	7.2	0.965	48.4	LOS D	28.4	211.8	0.70	0.91	0.97	26.2
NorthEast: Terrace Rd														
4	L2	179	4.1	179	4.1	0.364	25.8	LOS B	3.4	24.4	0.84	0.78	0.84	41.3
5	T1	99	3.2	99	3.2	0.930	76.9	LOS F	7.0	50.9	1.00	1.07	1.53	21.2
6	R2	62	6.8	62	6.8	0.930	82.5	LOS F	7.0	50.9	1.00	1.07	1.53	17.0
Approach		340	4.3	340	4.3	0.930	51.0	LOS D	7.0	50.9	0.91	0.92	1.16	29.5
NorthWest: Bells Line of Road														
7	L2	39	0.0	39	0.0	0.433	39.0	LOS C	7.1	52.5	0.83	0.72	0.83	33.1
8	T1	511	7.2	511	7.2	0.554	34.0	LOS C	8.4	62.7	0.84	0.73	0.84	33.8
9	R2	71	3.0	71	3.0	0.340	41.5	LOS C	2.0	14.6	0.81	0.78	0.81	22.4
Approach		620	6.3	620	6.3	0.554	35.2	LOS C	8.4	62.7	0.84	0.73	0.84	32.6
SouthWest: Gross Vale Road														
10	L2	74	1.4	74	1.4	0.769	61.3	LOS E	8.0	57.4	1.00	0.90	1.12	10.7
11	T1	62	3.4	62	3.4	0.769	55.8	LOS D	8.0	57.4	1.00	0.90	1.12	25.1
12	R2	358	3.2	358	3.2	0.975	86.9	LOS F	13.4	96.4	1.00	1.05	1.48	19.6
Approach		494	3.0	494	3.0	0.975	79.2	LOS F	13.4	96.4	1.00	1.00	1.39	19.4
All Vehicles		2425	5.7	2425	5.7	0.975	51.7	LOS D	28.4	211.8	0.83	0.88	1.05	26.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	54.2	LOS E	0.1	0.1	0.95	0.95
P2	NorthEast Full Crossing	21	33.0	LOS D	0.1	0.1	0.74	0.74
P3	NorthWest Full Crossing	21	50.5	LOS E	0.1	0.1	0.92	0.92
P4	SouthWest Full Crossing	21	14.5	LOS B	0.0	0.0	0.49	0.49
All Pedestrians		84	38.1	LOS D			0.78	0.78

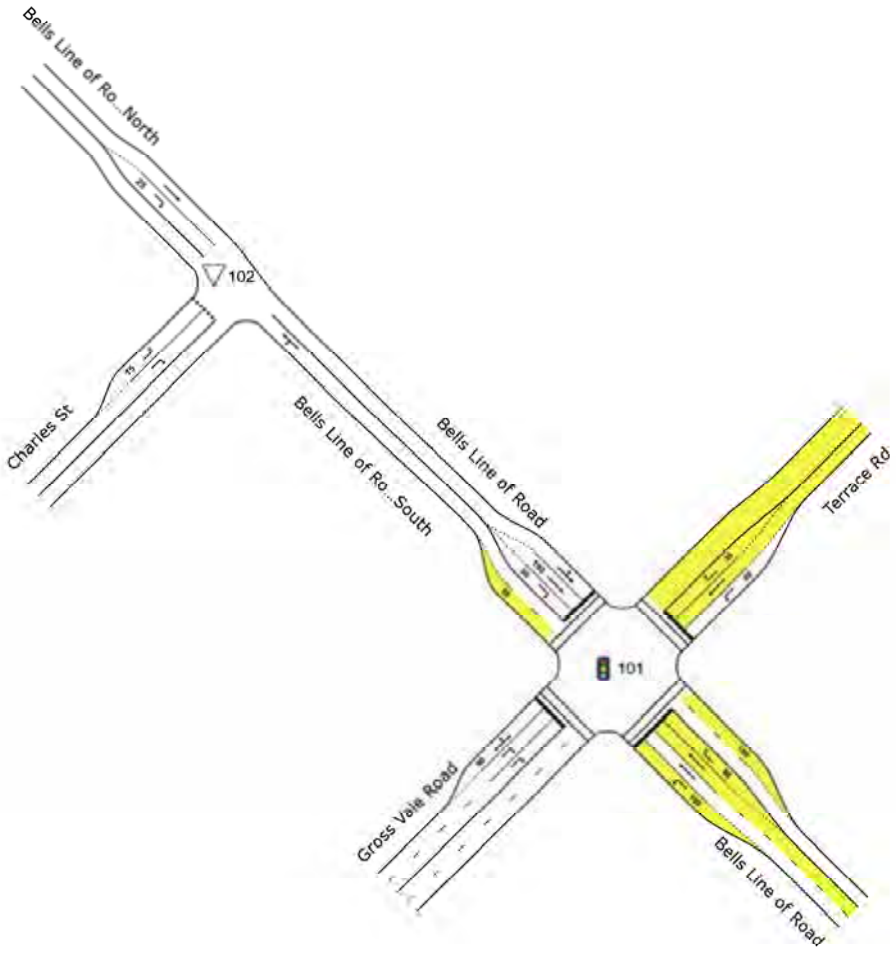
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [2027PM BC With Bridge 15-16pm]

New Network
Network Category: (None)

N



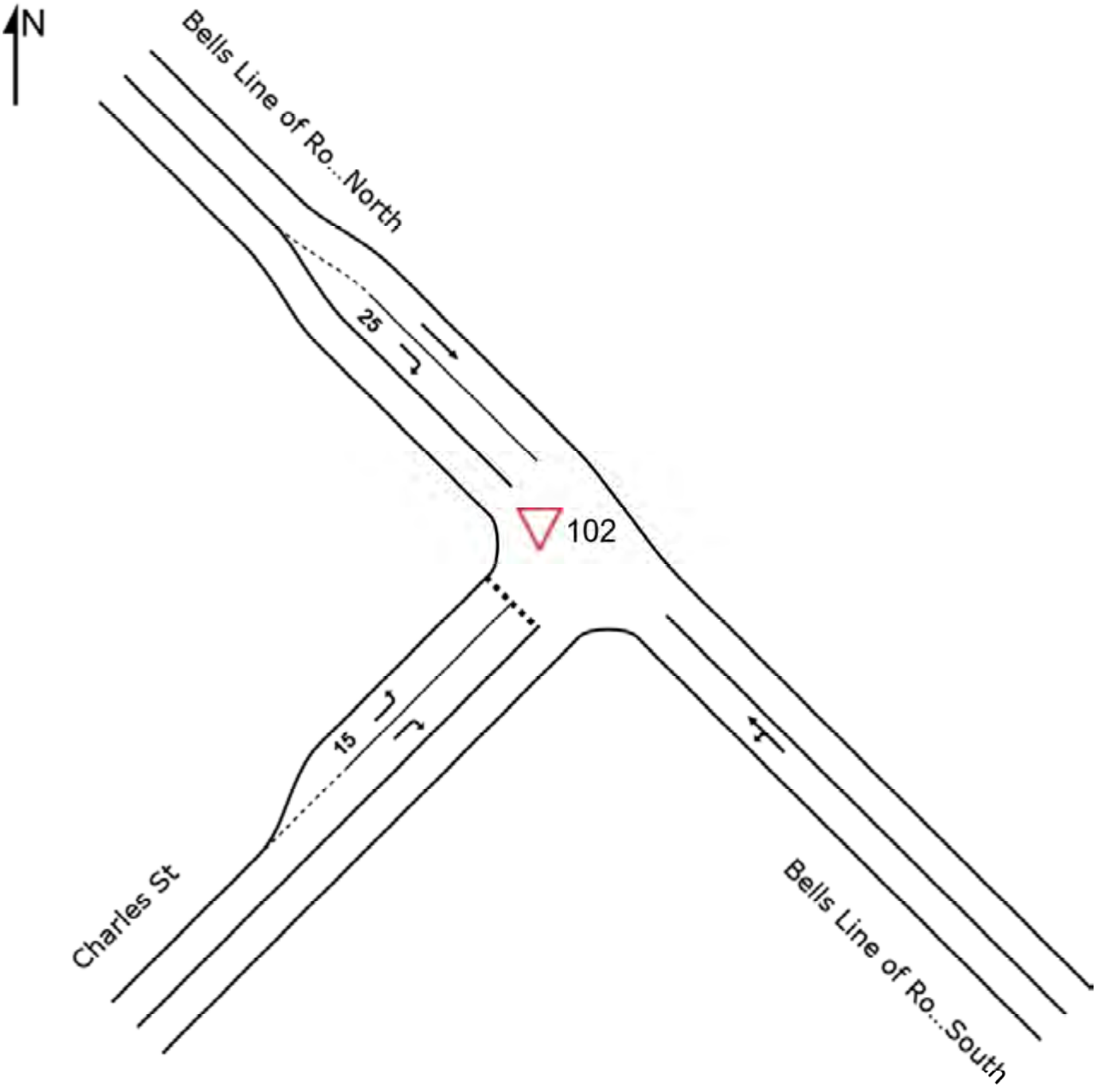
SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽102	NA	2027PM BC Charles St/ Bells Line of Rd -with new bridge 15-16pm
101	NA	2027PM BC Bells Line of Road/Gross Vale Road/Terrace Rd-with new bridge 15-16pm

Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:11:10 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

SITE LAYOUT

Site: 102 [2027PM BC Charles St/ Bells Line of Rd -with new bridge 15-16pm]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:11:52 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 102 [2027PM BC Charles St/ Bells Line of Rd -with new bridge 15-16pm]

Network: N101 [2027PM BC With Bridge 15-16pm]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

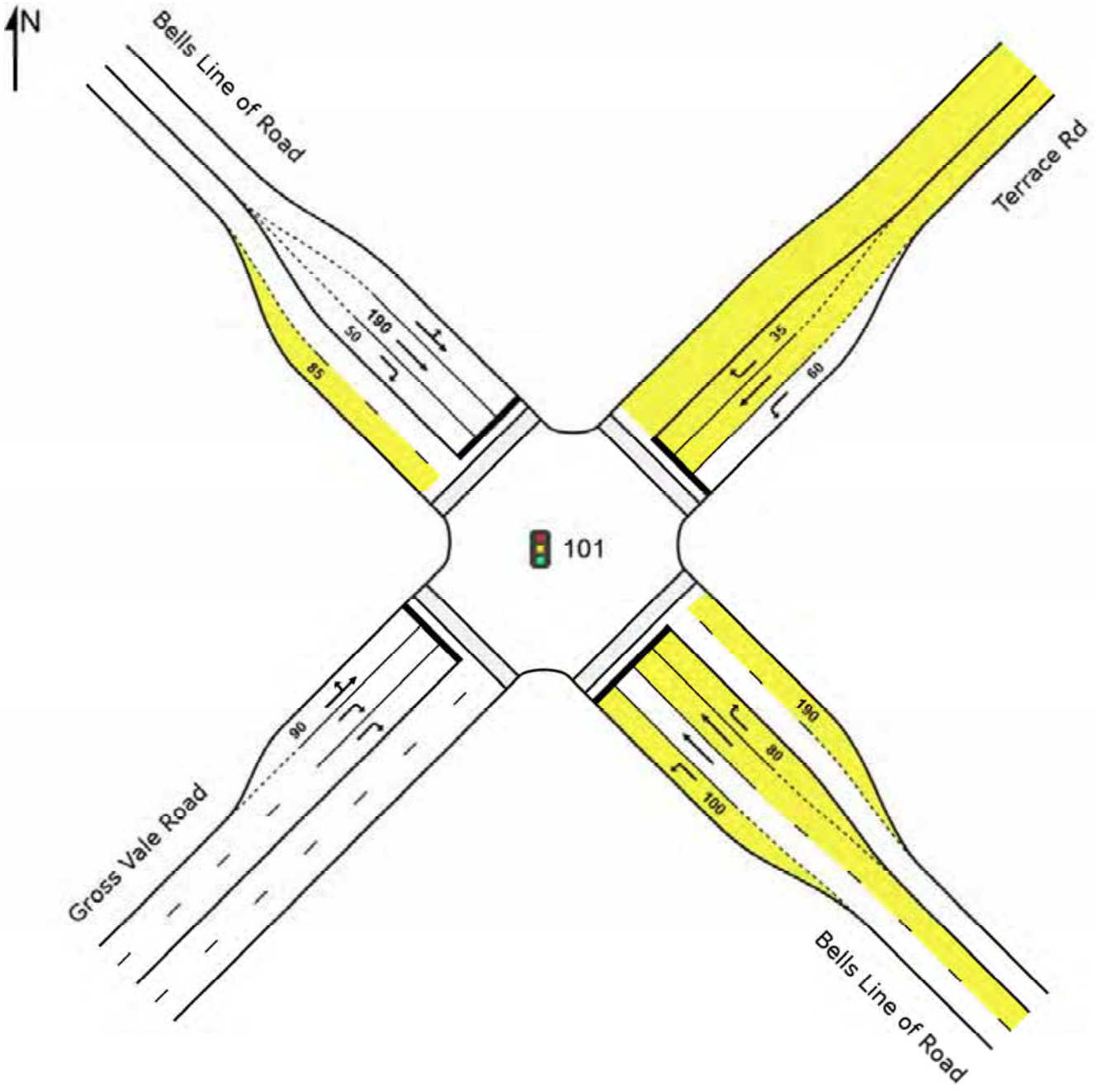
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road South														
1	L2	1	5.0	1	5.0	0.544	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	54.8
2	T1	983	5.0	983	5.0	0.544	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		984	5.0	984	5.0	0.544	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
NorthWest: Bells Line of Road North														
8	T1	612	5.0	612	5.0	0.340	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	28	5.0	28	5.0	0.039	9.4	LOS A	0.1	0.5	0.61	0.76	0.61	45.6
Approach		640	5.0	640	5.0	0.340	0.5	NA	0.1	0.5	0.03	0.03	0.03	58.9
SouthWest: Charles St														
10	L2	18	5.0	18	5.0	0.026	8.4	LOS A	0.0	0.3	0.58	0.72	0.58	45.8
12	R2	3	5.0	3	5.0	0.021	24.8	LOS B	0.0	0.2	0.85	0.93	0.85	14.9
Approach		21	5.0	21	5.0	0.026	10.8	LOS A	0.0	0.3	0.62	0.75	0.62	42.5
All Vehicles		1645	5.0	1645	5.0	0.544	0.4	NA	0.1	0.5	0.02	0.02	0.02	59.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2027PM BC Bells Line of Road/Gross Vale Road/Terrace Rd-with new bridge 15-16pm]

Site Category: (None)
Signals - Fixed Time Isolated



Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 101 [2027PM BC Bells Line of Road/Gross Vale Road/ Terrace Rd-with new bridge 15-16pm]

Network: N101 [2027PM BC With Bridge 15-16pm]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road														
1	L2	633	12.0	633	12.0	0.695	14.2	LOS A	7.7	59.7	0.77	0.82	0.77	42.8
2	T1	678	6.0	678	6.0	0.851	37.4	LOS C	13.9	102.4	0.93	0.89	1.05	27.3
3	R2	160	10.0	160	10.0	0.824	59.7	LOS E	5.3	40.2	1.00	0.94	1.30	29.9
Approach		1471	9.0	1471	9.0	0.851	29.8	LOS C	13.9	102.4	0.86	0.86	0.95	33.4
NorthEast: Terrace Rd														
4	L2	45	3.0	45	3.0	0.157	25.9	LOS B	0.6	4.6	0.89	0.72	0.89	41.2
5	T1	66	2.5	66	2.5	0.617	54.0	LOS D	2.1	15.1	1.00	0.79	1.10	26.7
6	R2	64	7.0	64	7.0	0.648	60.4	LOS E	2.1	15.4	1.00	0.81	1.14	20.4
Approach		176	4.3	176	4.3	0.648	49.1	LOS D	2.1	15.4	0.97	0.78	1.06	28.0
NorthWest: Bells Line of Road														
7	L2	23	0.0	23	0.0	0.392	34.0	LOS C	5.3	38.0	0.82	0.70	0.82	35.5
8	T1	433	3.0	433	3.0	0.392	28.5	LOS C	5.3	38.2	0.82	0.70	0.82	36.5
9	R2	153	0.0	153	0.0	0.733	55.5	LOS D	4.8	33.4	1.00	0.87	1.15	19.0
Approach		608	2.1	608	2.1	0.733	35.5	LOS C	5.3	38.2	0.87	0.74	0.90	31.6
SouthWest: Gross Vale Road														
10	L2	241	4.0	241	4.0	0.750	41.9	LOS C	10.9	77.7	0.96	0.88	1.02	14.9
11	T1	142	0.0	142	0.0	0.750	36.3	LOS C	10.9	77.7	0.96	0.88	1.02	31.2
12	R2	395	3.0	395	3.0	0.447	39.4	LOS C	5.0	36.0	0.89	0.80	0.89	30.8
Approach		778	2.8	778	2.8	0.750	39.6	LOS C	10.9	77.7	0.92	0.84	0.95	27.4
All Vehicles		3033	5.8	3033	5.8	0.851	34.6	LOS C	13.9	102.4	0.89	0.83	0.95	31.1

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

Movement Performance - Pedestrians

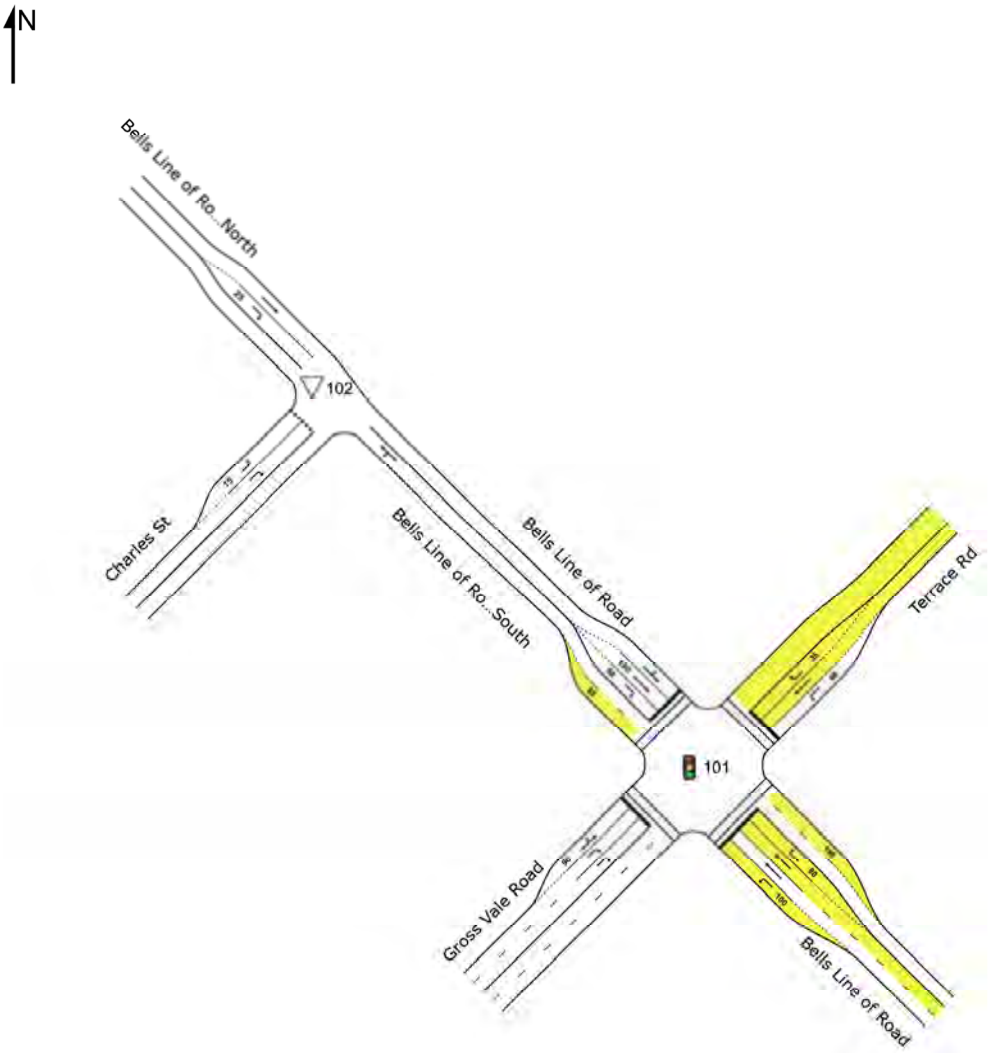
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	31.2	LOS D	0.0	0.0	0.79	0.79
P3	NorthWest Full Crossing	21	37.0	LOS D	0.1	0.1	0.86	0.86
P4	SouthWest Full Crossing	21	32.0	LOS D	0.0	0.0	0.80	0.80
All Pedestrians		84	36.1	LOS D			0.85	0.85

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [2027PM S1 Without Bridge 15-16pm]

New Network
Network Category: (None)



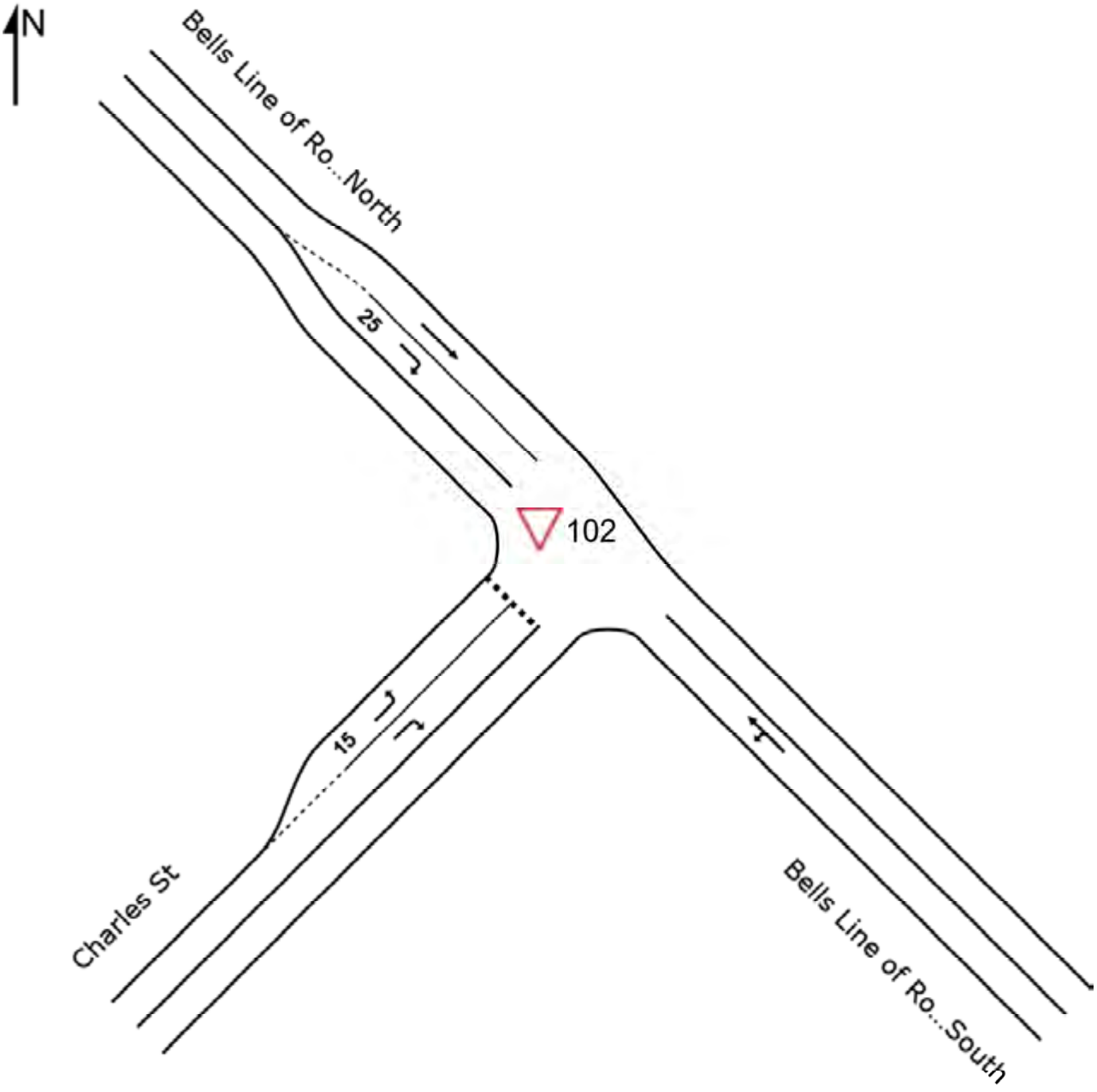
SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽102	NA	2027PM S1 Charles St/ Bells Line of Rd -without new bridge 15-16pm
101	NA	2027PM S1 Bells Line of Road/Gross Vale Road/Terrace Rd-without new bridge 15-16pm

Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:12:30 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

SITE LAYOUT

Site: 102 [2027PM S1 Charles St/ Bells Line of Rd -without new bridge 15-16pm]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:13:12 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 102 [2027PM S1 Charles St/ Bells Line of Rd -without new bridge 15-16pm]

Network: N101 [2027PM S1 Without Bridge 15-16pm]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

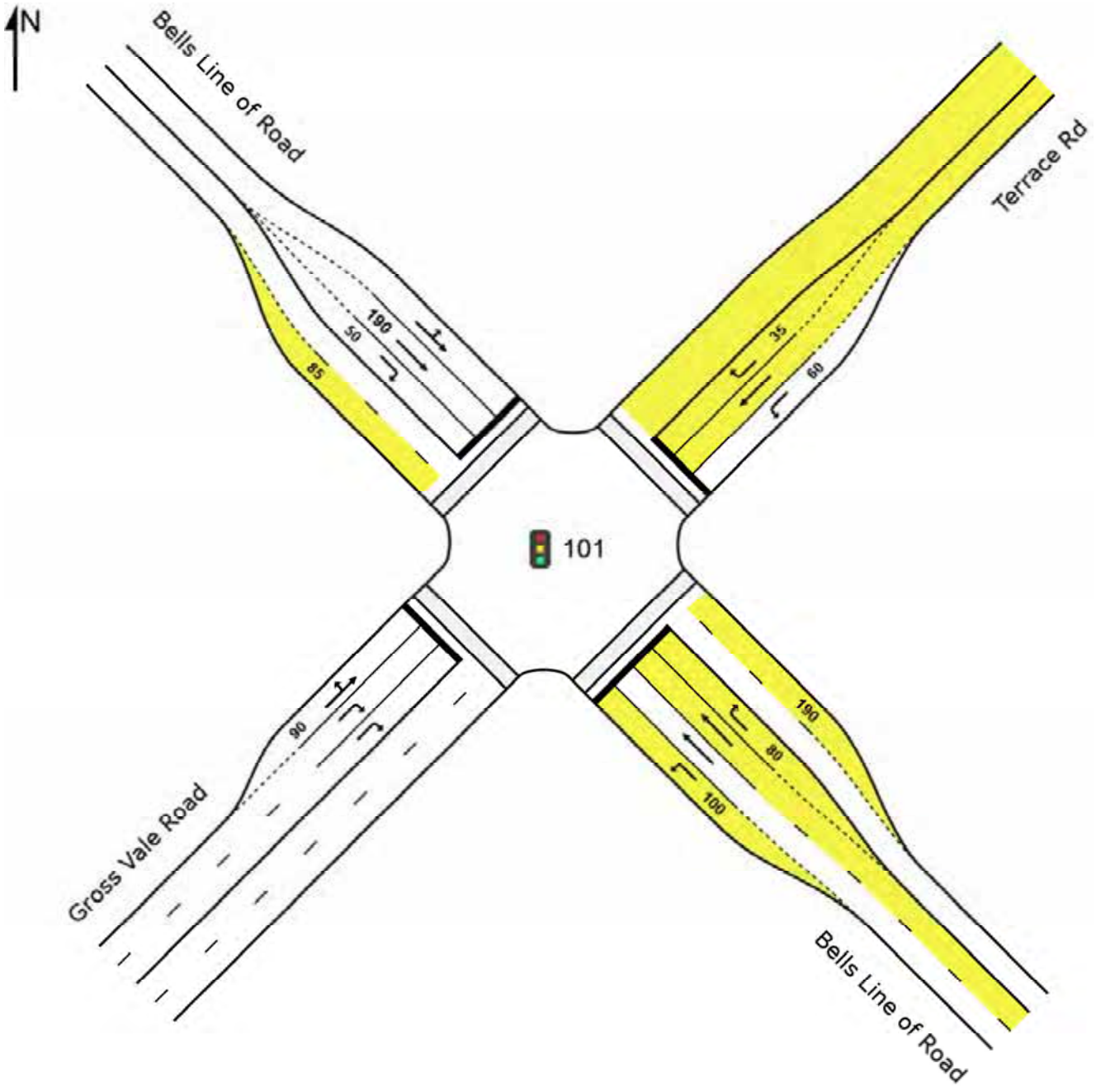
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road South														
1	L2	5	5.0	5	5.0	0.508	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	54.8
2	T1	914	5.0	914	5.0	0.508	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		919	5.0	919	5.0	0.508	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
NorthWest: Bells Line of Road North														
8	T1	563	5.0	563	5.0	0.314	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	38	5.0	38	5.0	0.049	9.1	LOS A	0.1	0.6	0.60	0.75	0.60	45.9
Approach		601	5.0	601	5.0	0.314	0.6	NA	0.1	0.6	0.04	0.05	0.04	58.5
SouthWest: Charles St														
10	L2	11	5.0	11	5.0	0.014	7.9	LOS A	0.0	0.2	0.56	0.67	0.56	46.2
12	R2	1	5.0	1	5.0	0.006	21.7	LOS B	0.0	0.1	0.83	0.87	0.83	16.3
Approach		12	5.0	12	5.0	0.014	9.2	LOS A	0.0	0.2	0.59	0.69	0.59	44.4
All Vehicles		1532	5.0	1532	5.0	0.508	0.4	NA	0.1	0.6	0.02	0.03	0.02	59.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2027PM S1 Bells Line of Road/Gross Vale Road/Terrace Rd-without new bridge 15-16pm]

Site Category: (None)
Signals - Fixed Time Isolated



Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 101 [2027PM S1 Bells Line of Road/Gross Vale Road/ Terrace Rd-without new bridge 15-16pm]

Network: N101 [2027PM S1 Without Bridge 15-16pm]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road														
1	L2	732	12.0	732	12.0	0.818	19.2	LOS B	11.7	90.3	0.87	0.88	0.93	39.6
2	T1	613	6.0	613	6.0	0.868	42.7	LOS D	13.7	100.7	0.96	0.93	1.12	25.3
3	R2	182	10.0	182	10.0	0.865	62.2	LOS E	6.2	47.4	1.00	0.98	1.38	29.3
Approach		1526	9.4	1526	9.4	0.868	33.7	LOS C	13.7	100.7	0.92	0.91	1.06	32.0
NorthEast: Terrace Rd														
4	L2	49	3.0	49	3.0	0.162	25.6	LOS B	0.7	5.2	0.88	0.73	0.88	41.4
5	T1	73	2.5	73	2.5	0.676	54.7	LOS D	2.3	16.7	1.00	0.82	1.16	26.5
6	R2	73	7.0	73	7.0	0.733	61.7	LOS E	2.4	17.7	1.00	0.85	1.25	20.1
Approach		195	4.3	195	4.3	0.733	49.9	LOS D	2.4	17.7	0.97	0.81	1.12	27.7
NorthWest: Bells Line of Road														
7	L2	27	0.0	27	0.0	0.435	38.2	LOS C	5.3	38.0	0.87	0.74	0.87	33.6
8	T1	399	3.0	399	3.0	0.435	32.8	LOS C	5.3	38.2	0.87	0.73	0.87	34.4
9	R2	133	0.0	133	0.0	0.588	51.7	LOS D	3.9	27.3	0.99	0.80	1.00	19.9
Approach		559	2.1	559	2.1	0.588	37.5	LOS C	5.3	38.2	0.90	0.75	0.90	30.9
SouthWest: Gross Vale Road														
10	L2	234	4.0	234	4.0	0.558	34.0	LOS C	8.1	58.1	0.86	0.80	0.86	17.3
11	T1	100	0.0	100	0.0	0.558	28.4	LOS B	8.1	58.1	0.86	0.80	0.86	34.3
12	R2	460	3.0	460	3.0	0.451	36.4	LOS C	5.6	40.4	0.86	0.80	0.86	32.0
Approach		794	2.9	794	2.9	0.558	34.7	LOS C	8.1	58.1	0.86	0.80	0.86	29.5
All Vehicles		3074	6.1	3074	6.1	0.868	35.7	LOS C	13.7	100.7	0.91	0.85	0.98	30.8

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

Movement Performance - Pedestrians

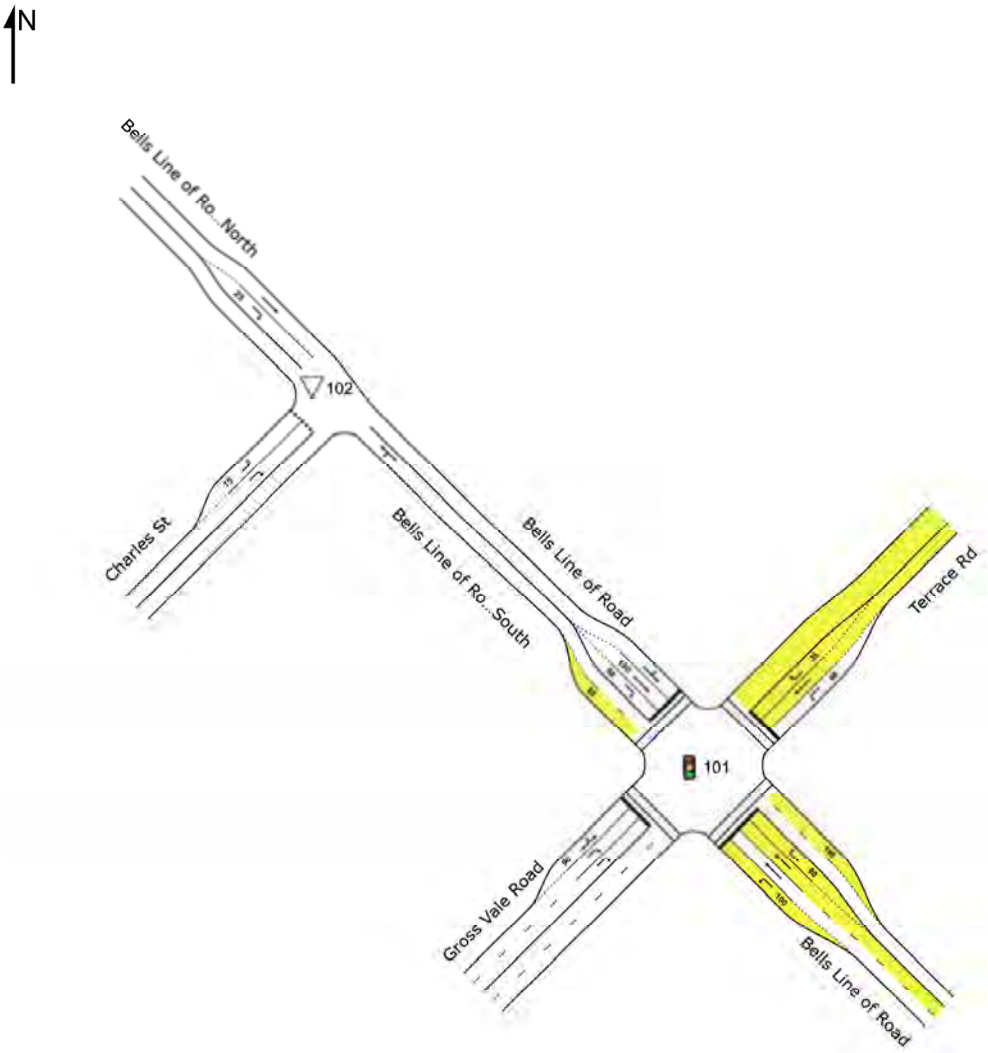
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	35.3	LOS D	0.1	0.1	0.84	0.84
P3	NorthWest Full Crossing	21	33.6	LOS D	0.0	0.0	0.82	0.82
P4	SouthWest Full Crossing	21	36.2	LOS D	0.1	0.1	0.85	0.85
All Pedestrians		84	37.3	LOS D			0.86	0.86

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [2027PM S2 Kurrajong+Kurmond 17-18pm]

New Network
Network Category: (None)



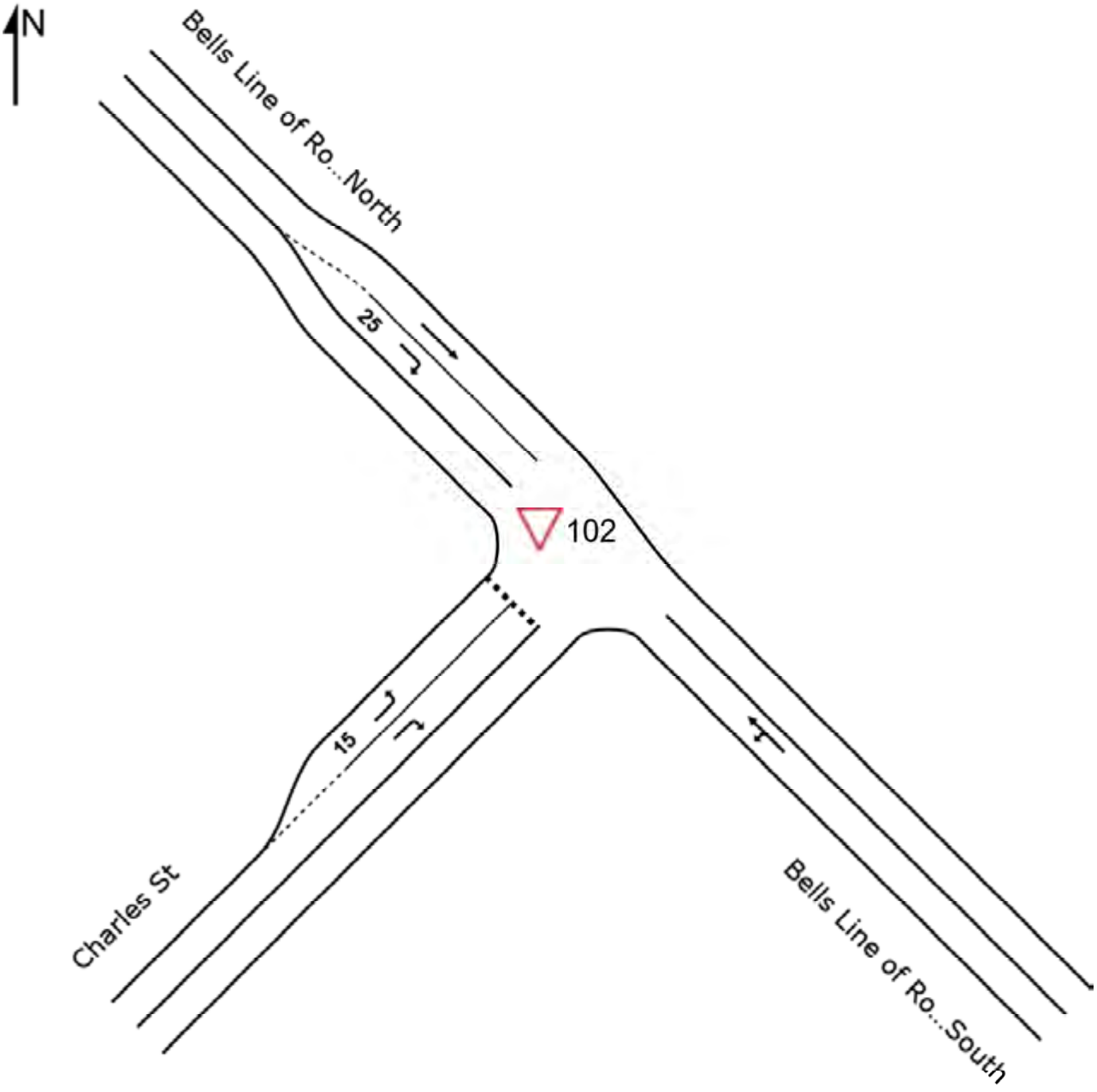
SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽102	NA	2027PM S2 Charles St/ Bells Line of Rd -Kurrajong+Kurmond 17-18pm
101	NA	2027PM S2 Bells Line of Road/Gross Vale Road/Terrace Rd -Kurrajong+ Kurmond 17-18pm

Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:13:52 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

SITE LAYOUT

Site: 102 [2027PM S2 Charles St/ Bells Line of Rd -Kurrajong+Kurmond 17-18pm]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:14:31 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 102 [2027PM S2 Charles St/ Bells Line of Rd -Kurrajong +Kurmond 17-18pm]

Network: N101 [2027PM S2 Kurrajong+Kurmond 17-18pm]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

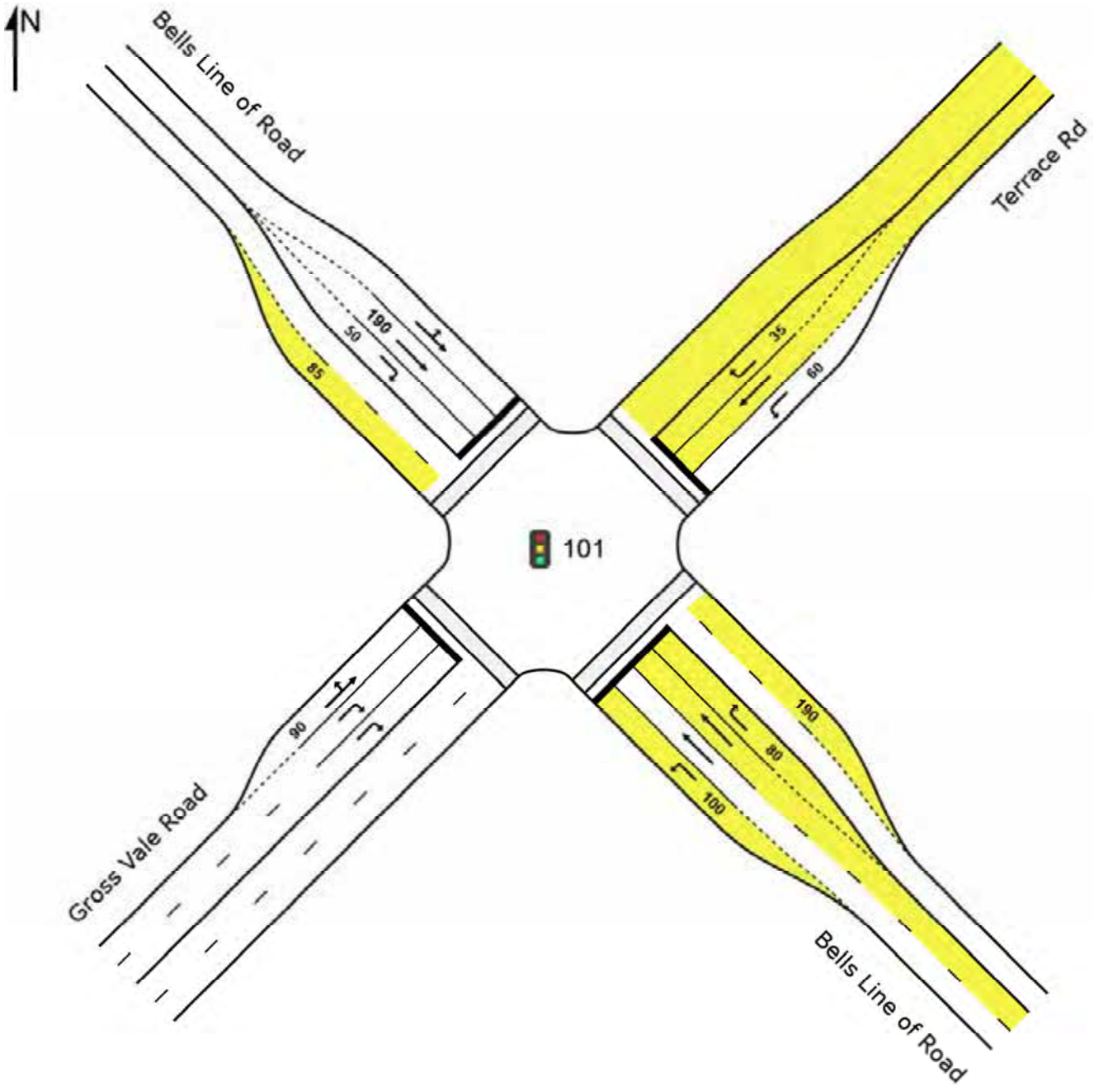
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road South														
1	L2	1	5.0	1	5.0	0.662	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	54.7
2	T1	1198	5.0	1198	5.0	0.662	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.7
Approach		1199	5.0	1199	5.0	0.662	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.7
NorthWest: Bells Line of Road North														
8	T1	478	5.0	478	5.0	0.266	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	21	5.0	21	5.0	0.035	10.7	LOS A	0.1	0.4	0.66	0.80	0.66	44.5
Approach		499	5.0	499	5.0	0.266	0.5	NA	0.1	0.4	0.03	0.03	0.03	58.9
SouthWest: Charles St														
10	L2	63	5.0	63	5.0	0.112	9.9	LOS A	0.2	1.2	0.67	0.85	0.67	44.4
12	R2	13	5.0	13	5.0	0.091	27.7	LOS B	0.1	0.8	0.87	0.94	0.87	13.8
Approach		76	5.0	76	5.0	0.112	12.9	LOS A	0.2	1.2	0.71	0.86	0.71	40.5
All Vehicles		1774	5.0	1774	5.0	0.662	0.7	NA	0.2	1.2	0.04	0.05	0.04	58.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2027PM S2 Bells Line of Road/Gross Vale Road/Terrace Rd -Kurrajong+ Kurmond 17-18pm]

Site Category: (None)
Signals - Fixed Time Isolated



Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 101 [2027PM S2 Bells Line of Road/Gross Vale Road/ Terrace Rd -Kurrajong+ Kurmond 17-18pm]

Network: N101 [2027PM S2 Kurrajong+Kurmond 17-18pm]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road														
1	L2	656	12.0	656	12.0	0.733	14.8	LOS B	8.0	61.4	0.80	0.83	0.80	42.4
2	T1	854	6.0	854	6.0	0.967	53.7	LOS D	23.0	169.5	0.94	1.07	1.27	22.0
3	R2	165	10.0	165	10.0	0.928	72.0	LOS F	6.2	46.8	1.00	1.07	1.61	27.2
Approach		1675	8.7	1675	8.7	0.967	40.3	LOS C	23.0	169.5	0.89	0.98	1.12	28.9
NorthEast: Terrace Rd														
4	L2	74	3.0	74	3.0	0.241	26.2	LOS B	1.2	8.3	0.89	0.75	0.89	41.1
5	T1	129	2.5	129	2.5	0.903	62.5	LOS E	4.6	32.8	1.00	1.02	1.56	24.6
6	R2	55	7.0	55	7.0	0.414	55.9	LOS D	1.7	12.3	0.99	0.75	0.99	21.5
Approach		258	3.6	258	3.6	0.903	50.7	LOS D	4.6	32.8	0.97	0.89	1.25	28.3
NorthWest: Bells Line of Road														
7	L2	8	0.0	8	0.0	0.273	29.9	LOS C	3.8	27.1	0.75	0.63	0.75	37.7
8	T1	348	3.0	348	3.0	0.273	24.4	LOS B	3.8	27.1	0.75	0.63	0.75	38.7
9	R2	143	0.0	143	0.0	0.750	56.8	LOS E	4.5	31.7	1.00	0.88	1.18	18.7
Approach		500	2.1	500	2.1	0.750	33.8	LOS C	4.5	31.7	0.82	0.70	0.87	32.1
SouthWest: Gross Vale Road														
10	L2	292	4.0	292	4.0	0.903	59.3	LOS E	14.5	103.9	1.00	1.04	1.34	11.1
11	T1	113	0.0	113	0.0	0.903	53.7	LOS D	14.5	103.9	1.00	1.04	1.34	25.6
12	R2	129	3.0	129	3.0	0.182	41.0	LOS C	1.6	11.6	0.86	0.74	0.86	30.3
Approach		534	2.9	534	2.9	0.903	53.7	LOS D	14.5	103.9	0.97	0.97	1.22	19.8
All Vehicles		2966	6.1	2966	6.1	0.967	42.5	LOS C	23.0	169.5	0.90	0.92	1.11	27.7

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

Movement Performance - Pedestrians

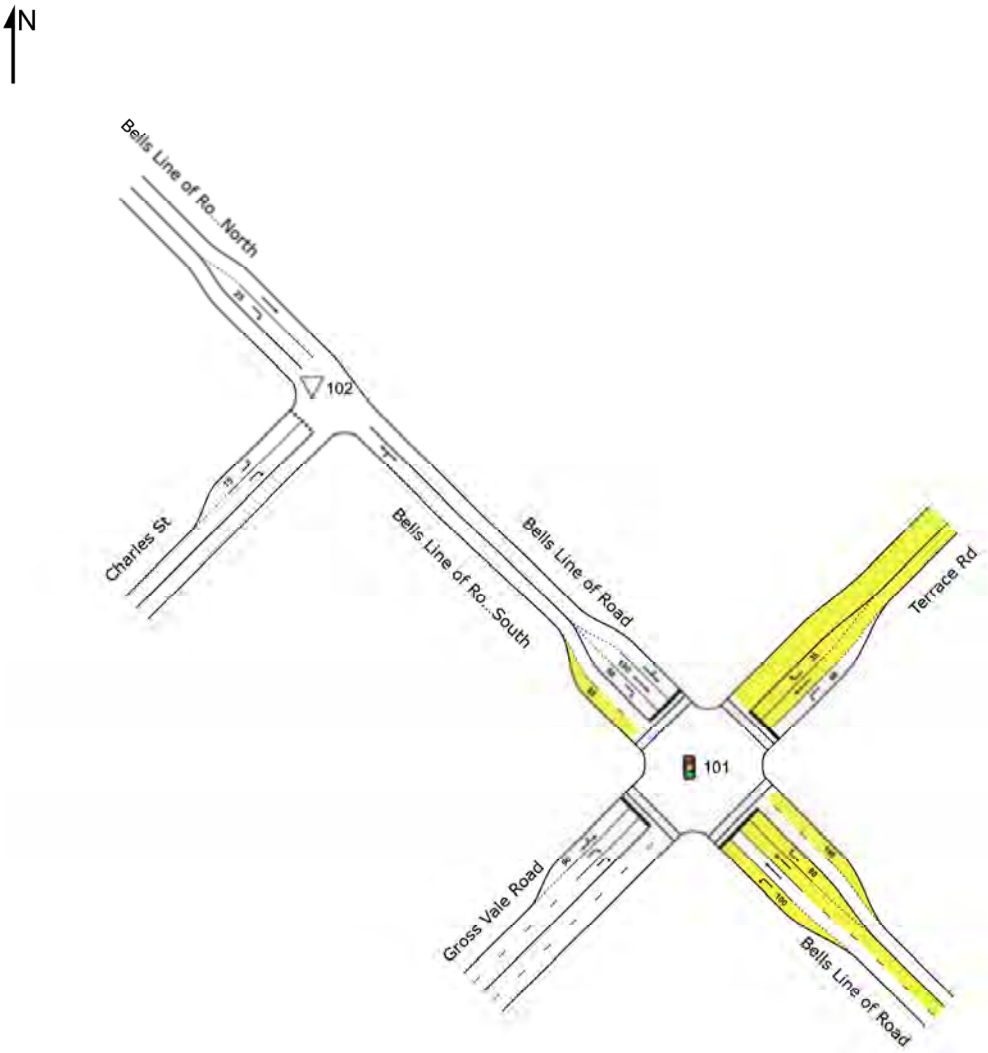
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	28.1	LOS C	0.0	0.0	0.75	0.75
P3	NorthWest Full Crossing	21	41.4	LOS E	0.1	0.1	0.91	0.91
P4	SouthWest Full Crossing	21	28.9	LOS C	0.0	0.0	0.76	0.76
All Pedestrians		84	35.7	LOS D			0.84	0.84

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [2027PM S3 5% Town Centre Growth 16-17pm]

New Network
Network Category: (None)



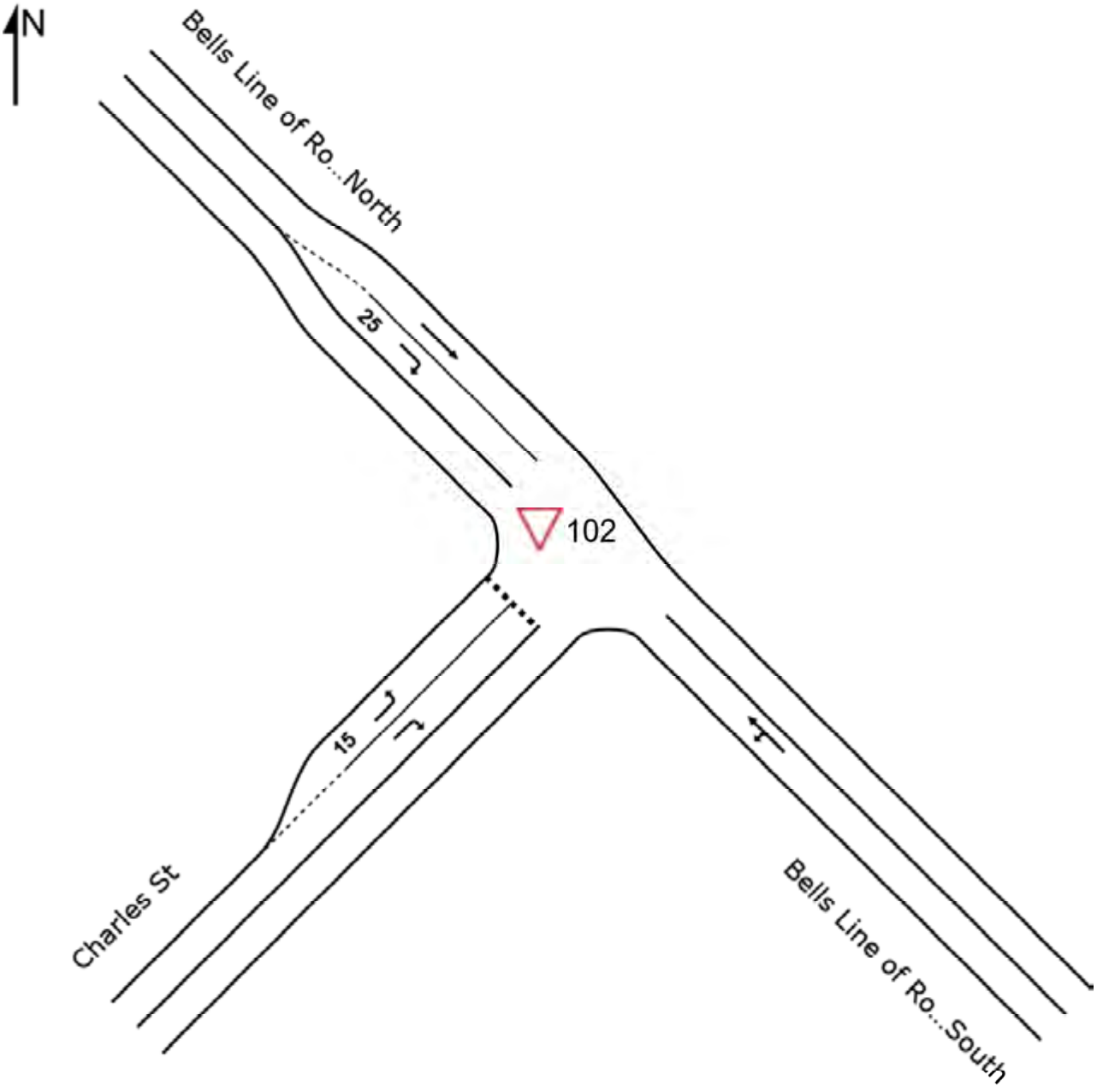
SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽102	NA	2027PM S3 Charles St/ Bells Line of Rd -5% Town Centre Growth 16-17pm
101	NA	2027PM S3 Bells Line of Road/Gross Vale Road/Terrace Rd -5% Town Centre Growth 16-17pm

Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:15:26 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

SITE LAYOUT

Site: 102 [2027PM S3 Charles St/ Bells Line of Rd -5% Town Centre Growth 16-17pm]

Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:16:08 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 102 [2027PM S3 Charles St/ Bells Line of Rd -5% Town Centre Growth 16-17pm]

Network: N101 [2027PM S3 5% Town Centre Growth 16-17pm]

Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

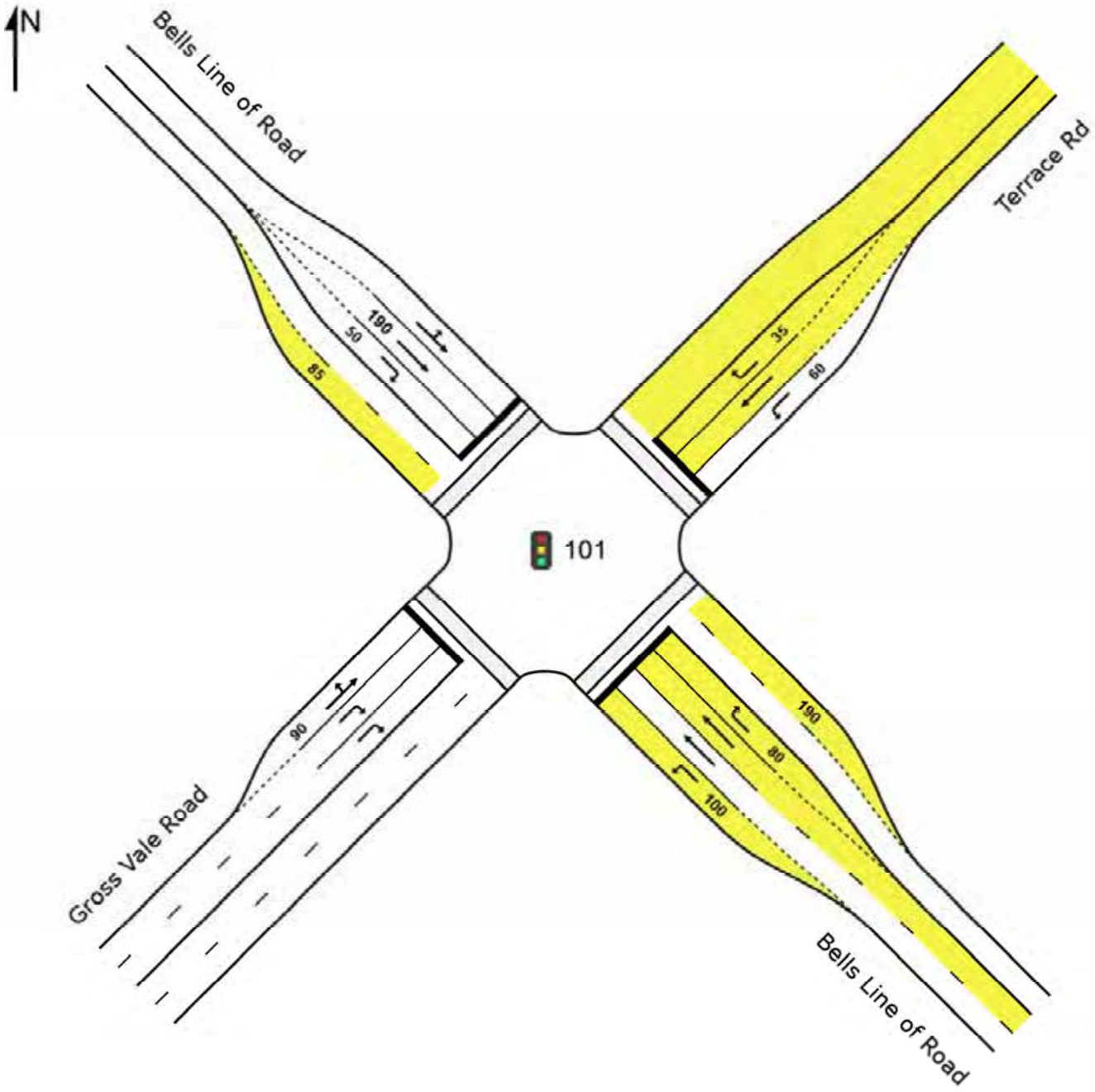
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	Aver. Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bells Line of Road South														
1	L2	1	5.0	1	5.0	0.563	5.6	LOS A	0.0	0.0	0.00	0.00	0.00	54.8
2	T1	1019	5.0	1019	5.0	0.563	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1020	5.0	1020	5.0	0.563	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
NorthWest: Bells Line of Road North														
8	T1	552	5.0	552	5.0	0.307	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
9	R2	16	5.0	16	5.0	0.022	9.6	LOS A	0.0	0.3	0.62	0.73	0.62	45.5
Approach		567	5.0	567	5.0	0.307	0.3	NA	0.0	0.3	0.02	0.02	0.02	59.3
SouthWest: Charles St														
10	L2	13	5.0	13	5.0	0.019	8.5	LOS A	0.0	0.2	0.59	0.71	0.59	45.7
12	R2	1	5.0	1	5.0	0.007	23.4	LOS B	0.0	0.1	0.84	0.89	0.84	15.5
Approach		14	5.0	14	5.0	0.019	9.7	LOS A	0.0	0.2	0.61	0.72	0.61	44.1
All Vehicles		1601	5.0	1601	5.0	0.563	0.2	NA	0.0	0.3	0.01	0.01	0.01	59.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 101 [2027PM S3 Bells Line of Road/Gross Vale Road/Terrace Rd -5% Town Centre Growth 16-17pm]

Site Category: (None)
Signals - Fixed Time Isolated



Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Richmond\Gross Vale Rd_Charles St-Bells Line of Rd 2027 Vol 20191001.sip8

MOVEMENT SUMMARY

Site: 101 [2027PM S3 Bells Line of Road/Gross Vale Road/ Terrace Rd -5% Town Centre Growth 16-17pm]

Network: N101 [2027PM S3 5% Town Centre Growth 16-17pm]

Site Category: (None)
Signals - Fixed Time Isolated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	Aver. Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bells Line of Road														
1	L2	639	12.0	639	12.0	0.784	18.7	LOS B	9.8	75.9	0.88	0.87	0.91	39.8
2	T1	685	6.0	685	6.0	0.981	62.3	LOS E	19.5	143.6	0.96	1.11	1.37	20.0
3	R2	208	10.0	208	10.0	0.805	55.7	LOS D	6.7	50.9	1.00	0.92	1.22	30.9
Approach		1533	9.0	1533	9.0	0.981	43.2	LOS D	19.5	143.6	0.93	0.98	1.16	28.4
NorthEast: Terrace Rd														
4	L2	80	3.0	80	3.0	0.205	23.2	LOS B	1.0	7.4	0.84	0.74	0.84	42.5
5	T1	140	2.5	140	2.5	0.977	79.1	LOS F	5.7	40.5	1.00	1.14	1.84	21.2
6	R2	48	7.0	48	7.0	0.366	55.6	LOS D	1.5	10.8	0.99	0.74	0.99	21.5
Approach		268	3.5	268	3.5	0.977	58.2	LOS E	5.7	40.5	0.95	0.95	1.39	26.5
NorthWest: Bells Line of Road														
7	L2	1	0.0	1	0.0	0.250	35.6	LOS C	3.0	21.3	0.81	0.66	0.81	35.0
8	T1	254	3.0	254	3.0	0.250	30.1	LOS C	3.0	21.3	0.82	0.66	0.82	35.8
9	R2	258	0.0	258	0.0	0.929	69.7	LOS E	9.7	67.7	1.00	1.05	1.52	16.3
Approach		513	1.5	513	1.5	0.929	50.0	LOS D	9.7	67.7	0.91	0.86	1.17	24.7
SouthWest: Gross Vale Road														
10	L2	283	4.0	283	4.0	0.846	49.5	LOS D	13.3	95.4	1.00	0.97	1.19	12.9
11	T1	132	0.0	132	0.0	0.846	43.9	LOS D	13.3	95.4	1.00	0.97	1.19	28.5
12	R2	205	3.0	205	3.0	0.252	39.1	LOS C	2.5	18.0	0.85	0.76	0.85	31.0
Approach		620	2.8	620	2.8	0.846	44.9	LOS D	13.3	95.4	0.95	0.90	1.08	23.6
All Vehicles		2934	5.9	2934	5.9	0.981	46.1	LOS D	19.5	143.6	0.93	0.94	1.16	26.6

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	34.5	LOS D	0.0	0.0	0.83	0.83
P3	NorthWest Full Crossing	21	38.8	LOS D	0.1	0.1	0.88	0.88
P4	SouthWest Full Crossing	21	35.3	LOS D	0.1	0.1	0.84	0.84

All Pedestrians	84	38.2	LOS D	0.87	0.87

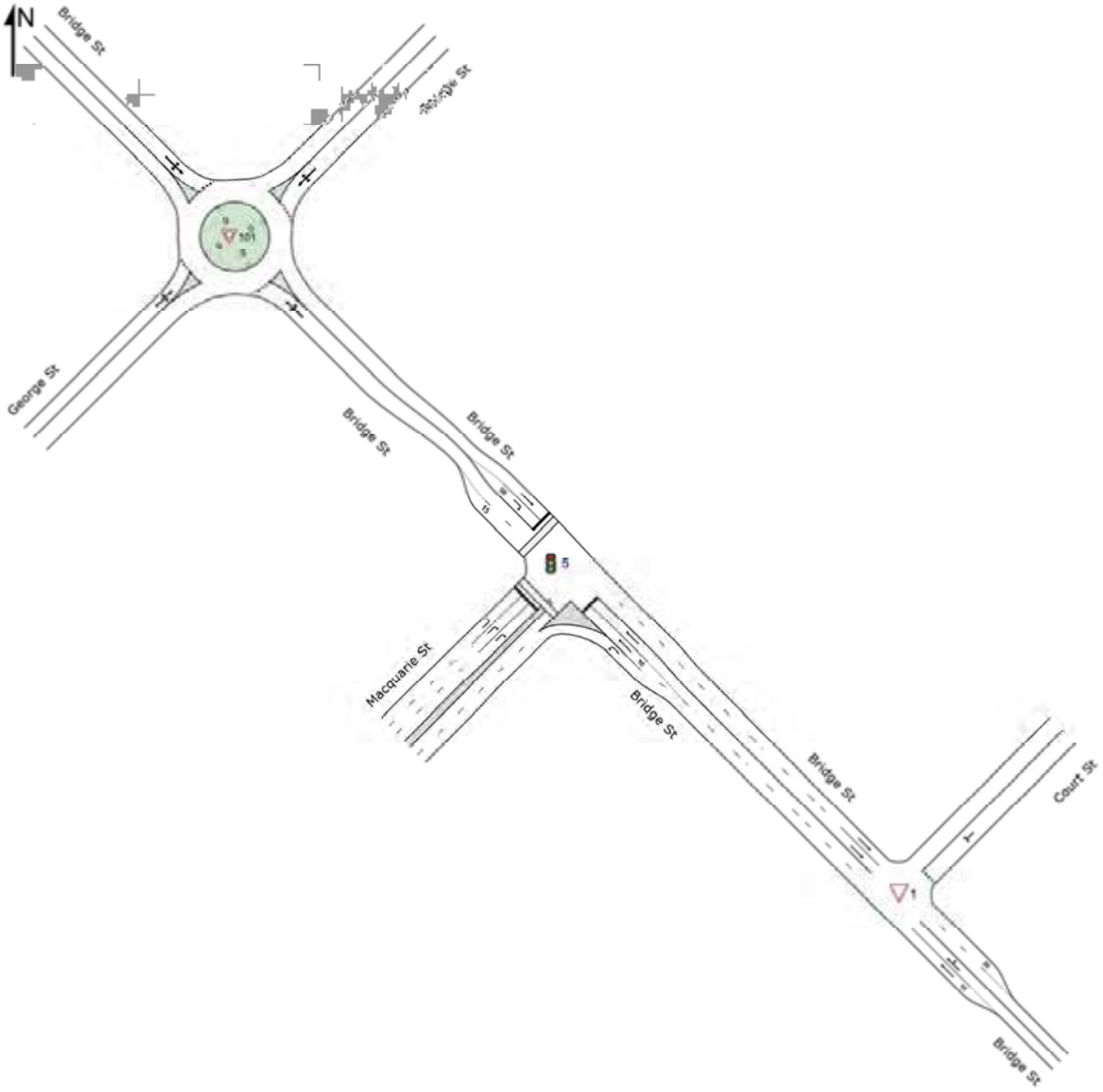
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

WINDSOR

NETWORK LAYOUT

Network: N101 [Windsor-2018AM BC 8-9am]

New Network
Network Category: (None)

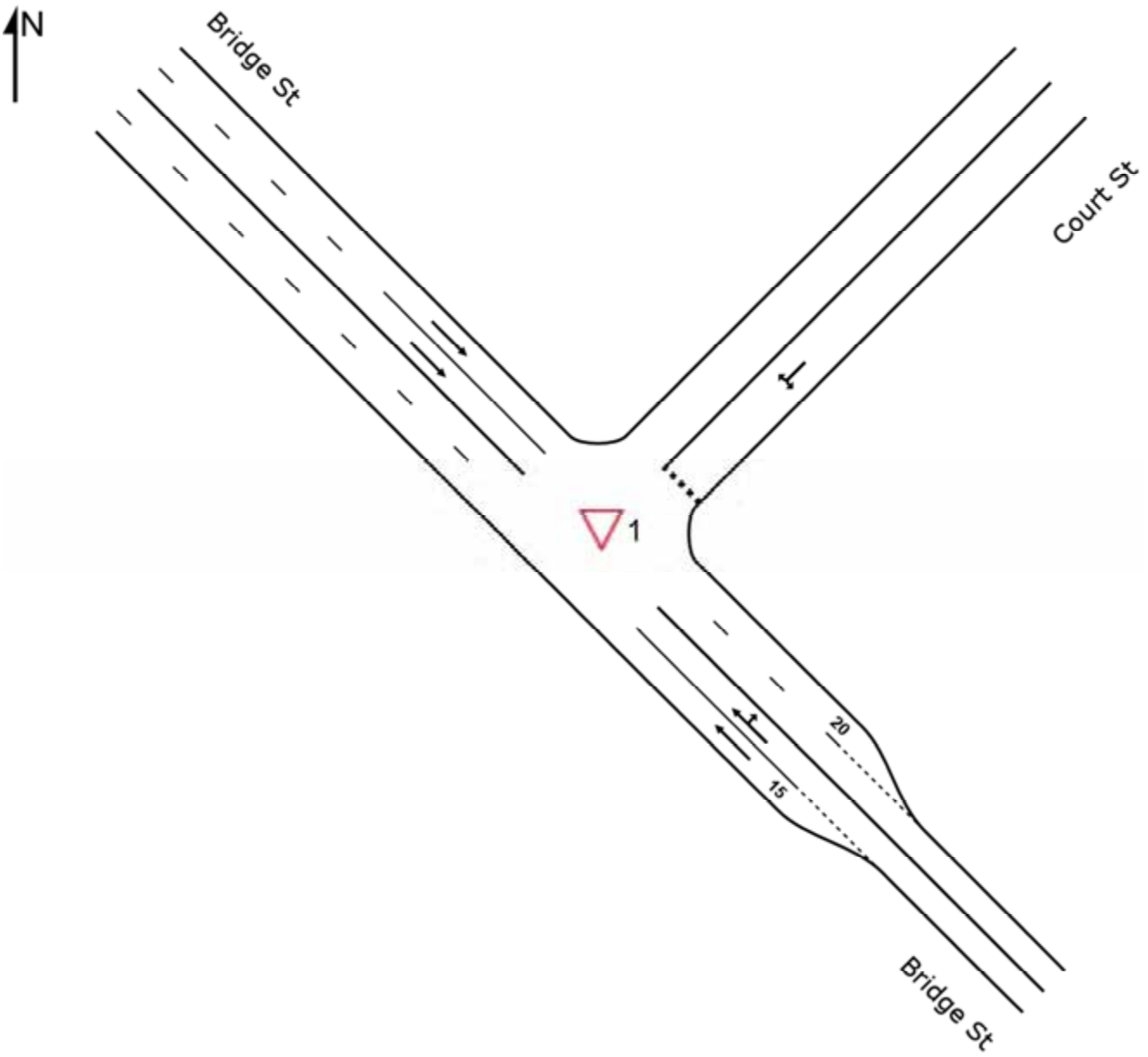


SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
1	NA	2018AM BC Bridge St/Court St 8-9am
5	NA	2018AM BC Macquarie St/Bridge St 8-9am
101	NA	2018AM BC Bridge St/George St 8-9am

SITE LAYOUT

Site: 1 [2018AM BC Bridge St/Court St 8-9am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 1 [2018AM BC Bridge St/Court St 8-9am]

Network: N101 [Windsor-2018AM BC 8-9am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

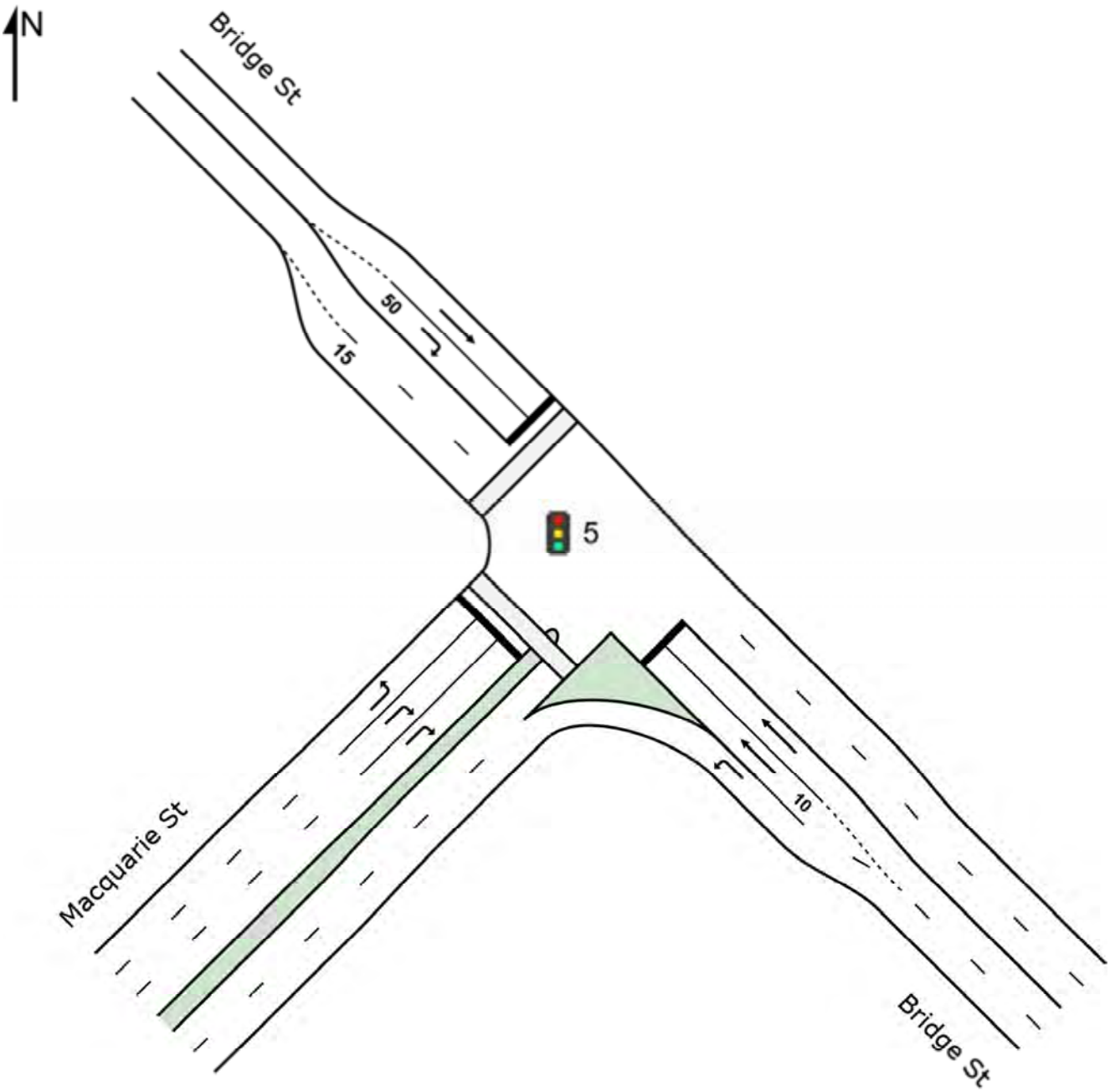
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
2	T1	855	10.1	855	10.1	0.275	0.6	LOS A	0.3	2.1	0.08	0.02	0.09	58.3
3	R2	26	8.0	26	8.0	0.275	13.2	LOS A	0.3	2.1	0.17	0.04	0.20	52.3
Approach		881	10.0	881	10.0	0.275	0.9	NA	0.3	2.1	0.08	0.02	0.09	57.9
NorthEast: Court St														
4	L2	11	10.0	11	10.0	0.375	12.7	LOS A	0.7	5.8	0.74	0.84	0.88	35.1
6	R2	23	13.6	23	13.6	0.375	45.1	LOS D	0.7	5.8	0.74	0.84	0.88	25.8
Approach		34	12.5	34	12.5	0.375	35.0	LOS C	0.7	5.8	0.74	0.84	0.88	29.5
NorthWest: Bridge St														
8	T1	982	7.2	982	7.2	0.468	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		982	7.2	982	7.2	0.468	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		1897	8.6	1897	8.6	0.468	1.1	NA	0.7	5.8	0.05	0.02	0.06	57.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [2018AM BC Macquarie St/Bridge St 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:29:03 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Winsdor\Windsor Br_final 20190919.sip8

MOVEMENT SUMMARY

Site: 5 [2018AM BC Macquarie St/Bridge St 8-9am]

Network: N101 [Windsor-2018AM BC 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bridge St														
1	L2	587	6.1	587	6.1	0.353	4.1	LOS A	0.0	0.0	0.00	0.51	0.00	53.1
2	T1	291	18.5	291	18.5	0.683	35.9	LOS C	10.1	81.6	0.91	0.77	0.94	6.1
Approach		878	10.2	878	10.2	0.683	14.7	LOS B	10.1	81.6	0.30	0.60	0.31	37.4
NorthWest: Bridge St														
8	T1	562	4.7	562	4.7	0.447	1.8	LOS A	3.1	22.6	0.12	0.11	0.12	44.9
9	R2	445	7.8	445	7.8	0.545	11.8	LOS A	6.6	49.2	0.54	0.73	0.54	43.3
Approach		1007	6.1	1007	6.1	0.545	6.2	LOS A	6.6	49.2	0.31	0.38	0.31	43.5
SouthWest: Macquarie St														
10	L2	240	11.8	240	11.8	0.883	62.0	LOS E	13.7	105.4	1.00	0.99	1.38	20.0
12	R2	420	10.5	420	10.5	0.723	50.1	LOS D	10.0	76.3	0.97	0.85	1.05	23.0
Approach		660	11.0	660	11.0	0.883	54.4	LOS D	13.7	105.4	0.98	0.90	1.17	21.8
All Vehicles		2545	8.8	2545	8.8	0.883	21.6	LOS B	13.7	105.4	0.48	0.59	0.53	31.2

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

Movement Performance - Pedestrians

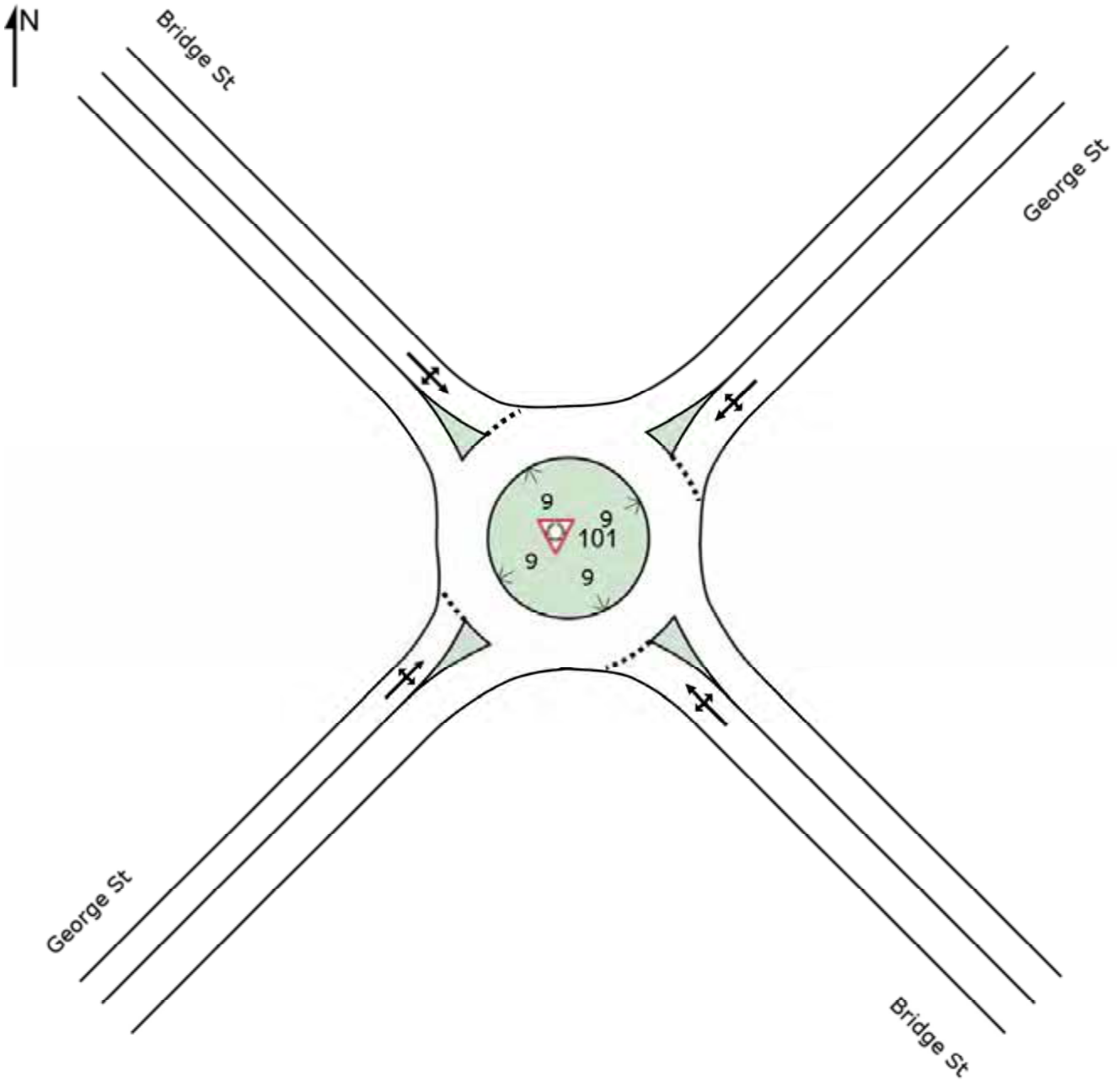
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	NorthWest Full Crossing	21	43.3	LOS E	0.1	0.1	0.93	0.93
P4	SouthWest Full Crossing	21	38.8	LOS D	0.1	0.1	0.88	0.88
All Pedestrians		42	41.0	LOS E			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 101 [2018AM BC Bridge St/George St 8-9am]

New Site
Site Category: (None)
Roundabout



MOVEMENT SUMMARY

Site: 101 [2018AM BC Bridge St/George St 8-9am]

Network: N101 [Windsor-2018AM BC 8-9am]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

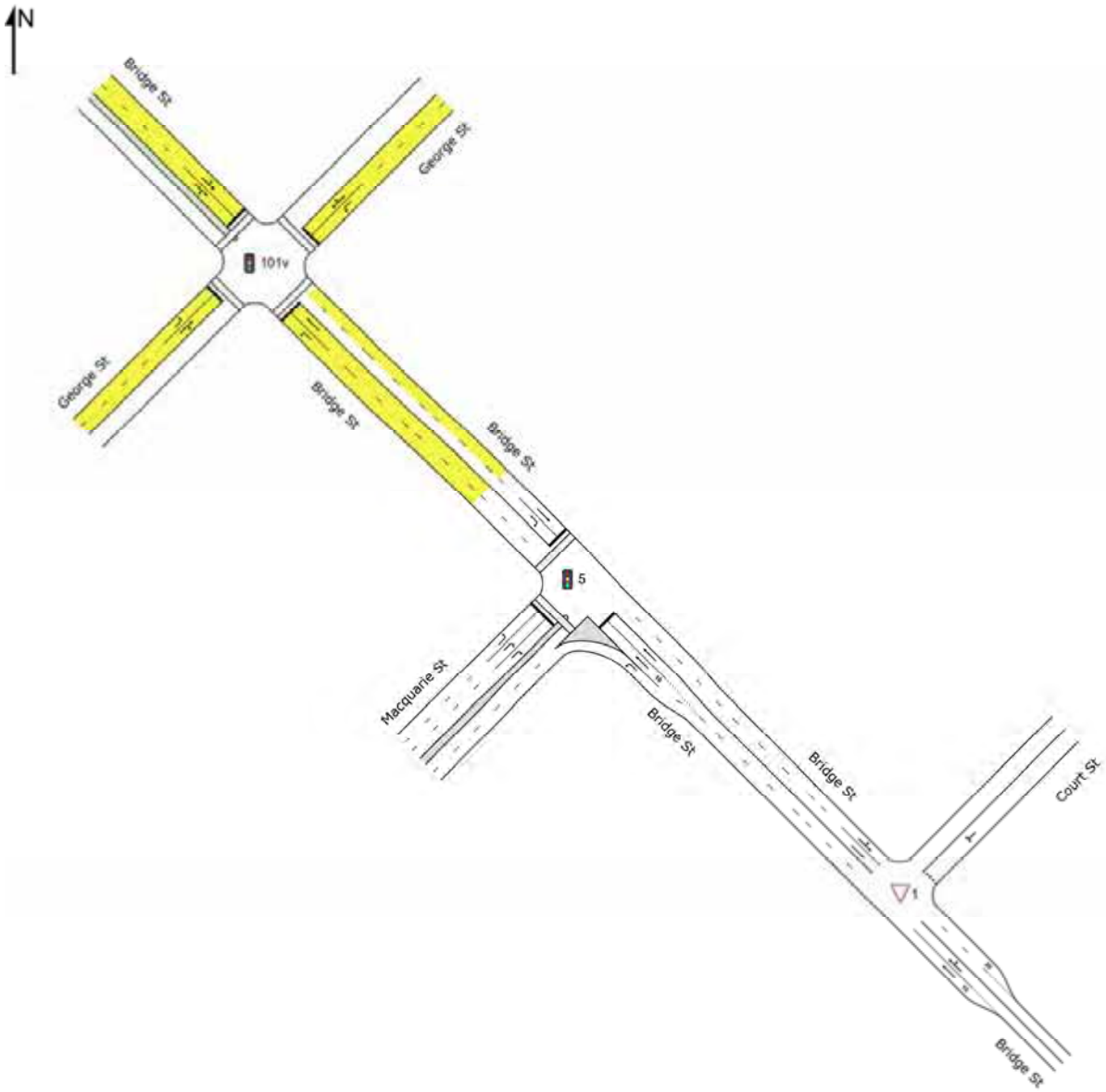
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	33	6.5	33	6.5	0.464	4.8	LOS A	2.5	19.9	0.27	0.52	0.27	44.4
2	T1	494	16.2	494	16.2	0.464	4.9	LOS A	2.5	19.9	0.27	0.52	0.27	48.0
3	R2	4	0.0	4	0.0	0.464	7.9	LOS A	2.5	19.9	0.27	0.52	0.27	45.6
Approach		531	15.5	531	15.5	0.464	5.0	LOS A	2.5	19.9	0.27	0.52	0.27	47.7
NorthEast: George St														
4	L2	18	5.9	18	5.9	0.107	13.3	LOS A	0.7	4.8	0.85	0.86	0.85	36.4
5	T1	17	6.3	17	6.3	0.107	13.1	LOS A	0.7	4.8	0.85	0.86	0.85	42.1
6	R2	13	8.3	13	8.3	0.107	16.4	LOS B	0.7	4.8	0.85	0.86	0.85	42.2
Approach		47	6.7	47	6.7	0.107	14.1	LOS A	0.7	4.8	0.85	0.86	0.85	40.5
NorthWest: Bridge St														
7	L2	15	7.1	15	7.1	0.745	5.3	LOS A	11.6	85.0	0.41	0.46	0.41	47.2
8	T1	961	6.0	961	6.0	0.745	5.3	LOS A	11.6	85.0	0.41	0.46	0.41	45.6
9	R2	122	5.2	122	5.2	0.745	8.4	LOS A	11.6	85.0	0.41	0.46	0.41	47.9
Approach		1098	5.9	1098	5.9	0.745	5.7	LOS A	11.6	85.0	0.41	0.46	0.41	46.1
SouthWest: George St														
10	L2	65	16.1	65	16.1	0.125	8.7	LOS A	1.0	8.1	0.71	0.63	0.71	44.4
11	T1	5	0.0	5	0.0	0.125	8.1	LOS A	1.0	8.1	0.71	0.63	0.71	44.5
12	R2	28	7.4	28	7.4	0.125	11.5	LOS A	1.0	8.1	0.71	0.63	0.71	39.9
Approach		99	12.8	99	12.8	0.125	9.4	LOS A	1.0	8.1	0.71	0.63	0.71	43.5
All Vehicles		1775	9.2	1775	9.2	0.745	5.9	LOS A	11.6	85.0	0.40	0.50	0.40	46.0

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

NETWORK LAYOUT

Network: N101 [Windsor-2027AM BC 8-9am]

New Network
Network Category: (None)

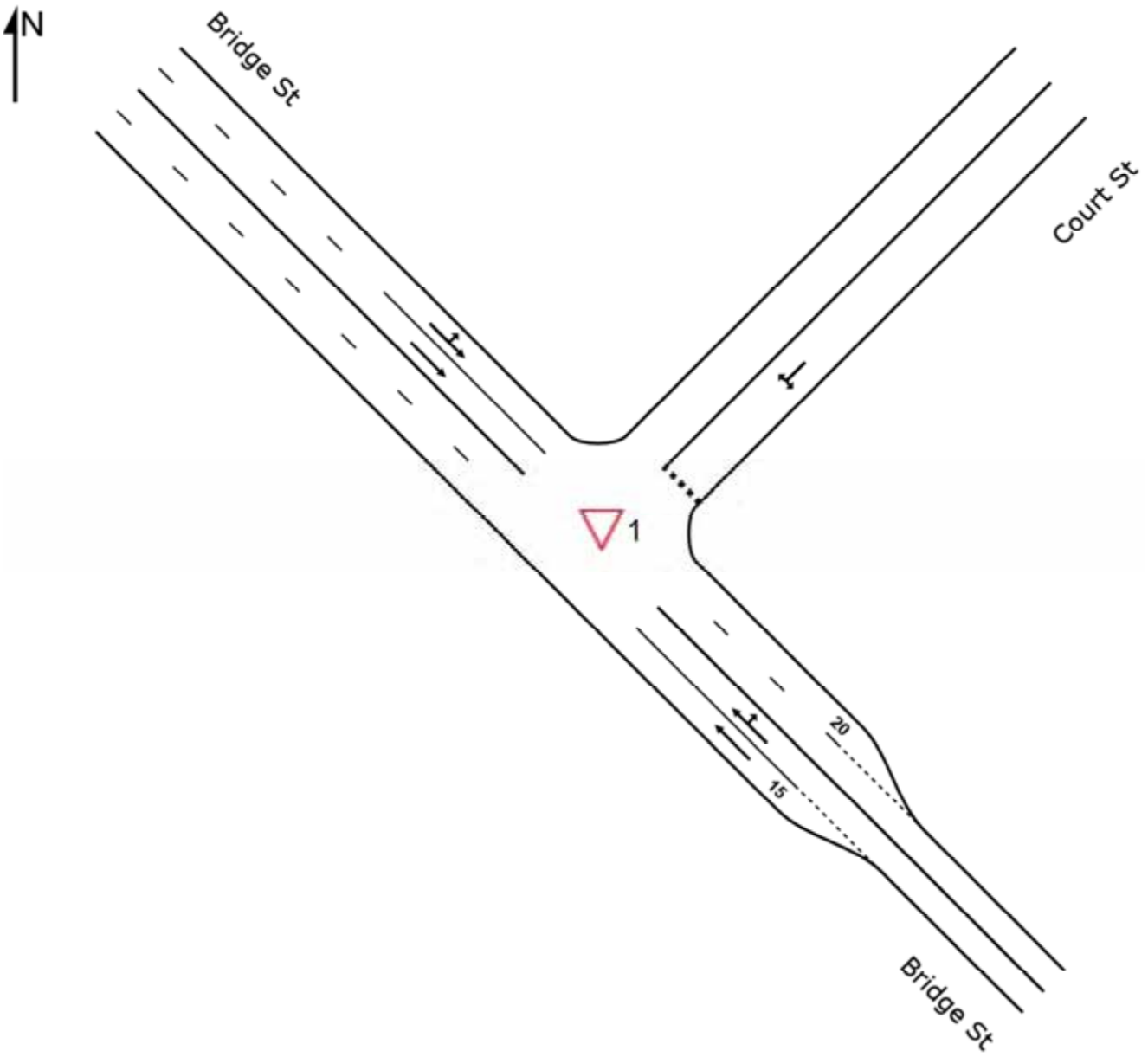


SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽1	NA	2027AM BC Bridge St/Court St 8-9am
5	NA	2027AM BC Macquarie St/Bridge St 8-9am
101v	NA	2027AM BC Bridge St/George St 8-9am

SITE LAYOUT

Site: 1 [2027AM BC Bridge St/Court St 8-9am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:30:28 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Winsdor\Windsor Br_final 20190919.sip8

MOVEMENT SUMMARY

Site: 1 [2027AM BC Bridge St/Court St 8-9am]

Network: N101 [Windsor-2027AM BC 8-9am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

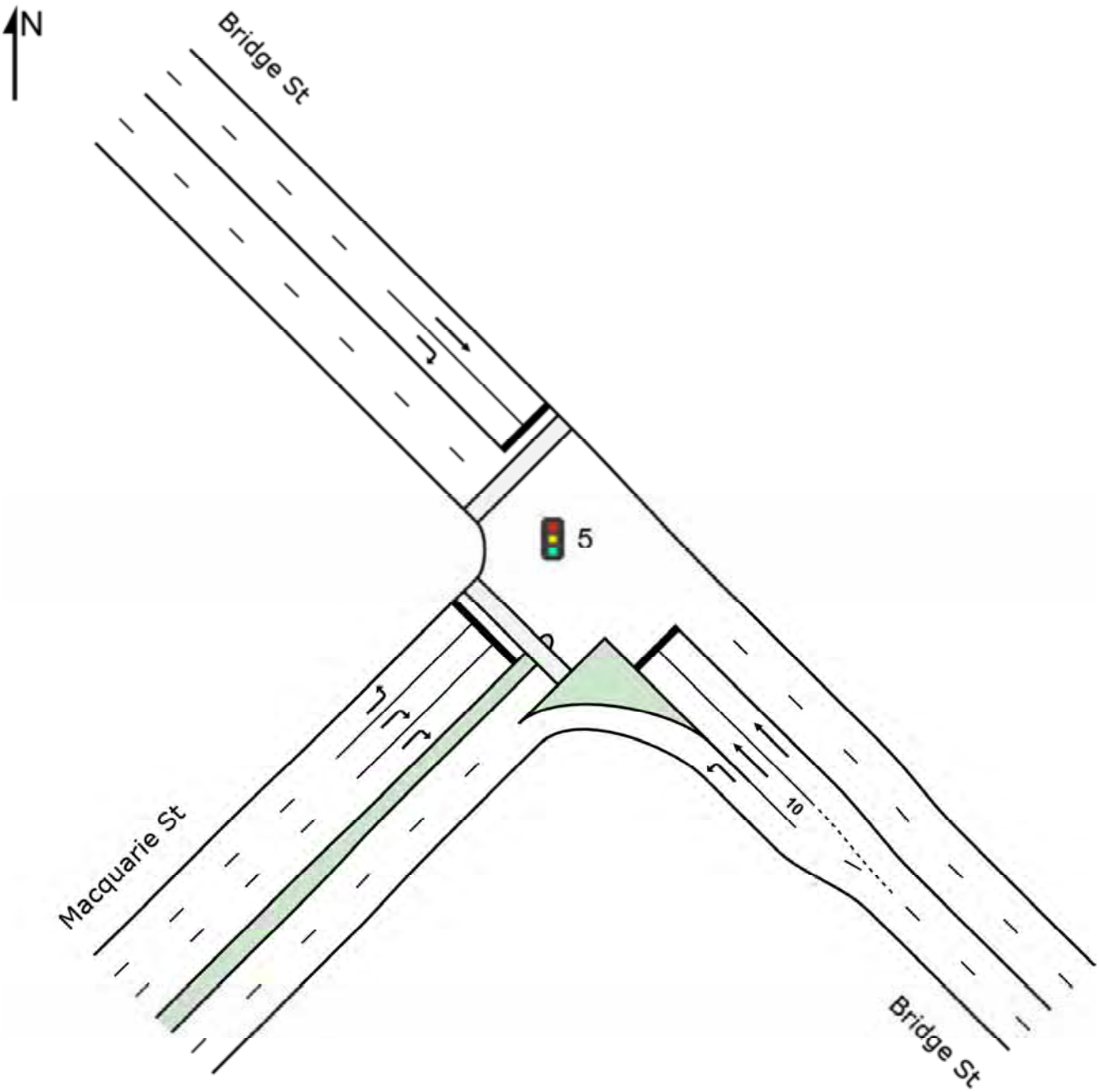
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
2	T1	1027	3.0	1027	3.0	0.307	1.5	LOS A	1.1	7.9	0.06	0.20	0.07	56.7
3	R2	21	3.0	21	3.0	0.307	13.6	LOS A	1.1	7.9	0.12	0.20	0.15	52.0
Approach		1048	3.0	1048	3.0	0.307	1.8	NA	1.1	7.9	0.06	0.20	0.07	56.5
NorthEast: Court St														
4	L2	1	3.0	1	3.0	0.137	4.8	LOS A	0.2	1.5	0.78	0.85	0.78	36.8
6	R2	8	3.0	8	3.0	0.137	33.6	LOS C	0.2	1.5	0.78	0.85	0.78	27.5
Approach		9	3.0	9	3.0	0.137	30.4	LOS C	0.2	1.5	0.78	0.85	0.78	28.9
NorthWest: Bridge St														
7	L2	95	3.0	95	3.0	0.100	3.9	LOS A	0.0	0.0	0.00	0.29	0.00	46.7
8	T1	944	3.0	944	3.0	0.484	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		1039	3.0	1039	3.0	0.484	0.4	NA	0.0	0.0	0.00	0.05	0.00	49.4
All Vehicles		2097	3.0	2097	3.0	0.484	1.2	NA	1.1	7.9	0.03	0.13	0.04	52.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [2027AM BC Macquarie St/Bridge St 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 5 [2027AM BC Macquarie St/Bridge St 8-9am]

Network: N101 [Windsor-2027AM BC 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	571	3.0	571	3.0	0.336	4.1	LOS A	0.0	0.0	0.00	0.51	0.00	53.3
2	T1	465	3.0	465	3.0	0.890	51.9	LOS D	11.4	81.6	0.90	1.02	1.34	4.3
Approach		1036	3.0	1036	3.0	0.890	25.6	LOS B	11.4	81.6	0.41	0.74	0.60	26.8
NorthWest: Bridge St														
8	T1	618	3.0	618	3.0	0.493	0.5	LOS A	1.2	8.3	0.04	0.04	0.04	46.4
9	R2	527	3.0	527	3.0	0.828	26.4	LOS B	15.9	114.2	0.84	0.86	0.90	31.0
Approach		1145	3.0	1145	3.0	0.828	12.4	LOS A	15.9	114.2	0.41	0.42	0.44	32.6
SouthWest: Macquarie St														
10	L2	304	3.0	304	3.0	0.294	15.4	LOS B	7.0	50.0	0.51	0.72	0.51	40.1
12	R2	515	3.0	515	3.0	0.798	51.7	LOS D	12.8	91.6	0.99	0.89	1.13	22.5
Approach		819	3.0	819	3.0	0.798	38.2	LOS C	12.8	91.6	0.81	0.83	0.90	26.9
All Vehicles		3000	3.0	3000	3.0	0.890	24.0	LOS B	15.9	114.2	0.52	0.64	0.62	28.4

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

Movement Performance - Pedestrians

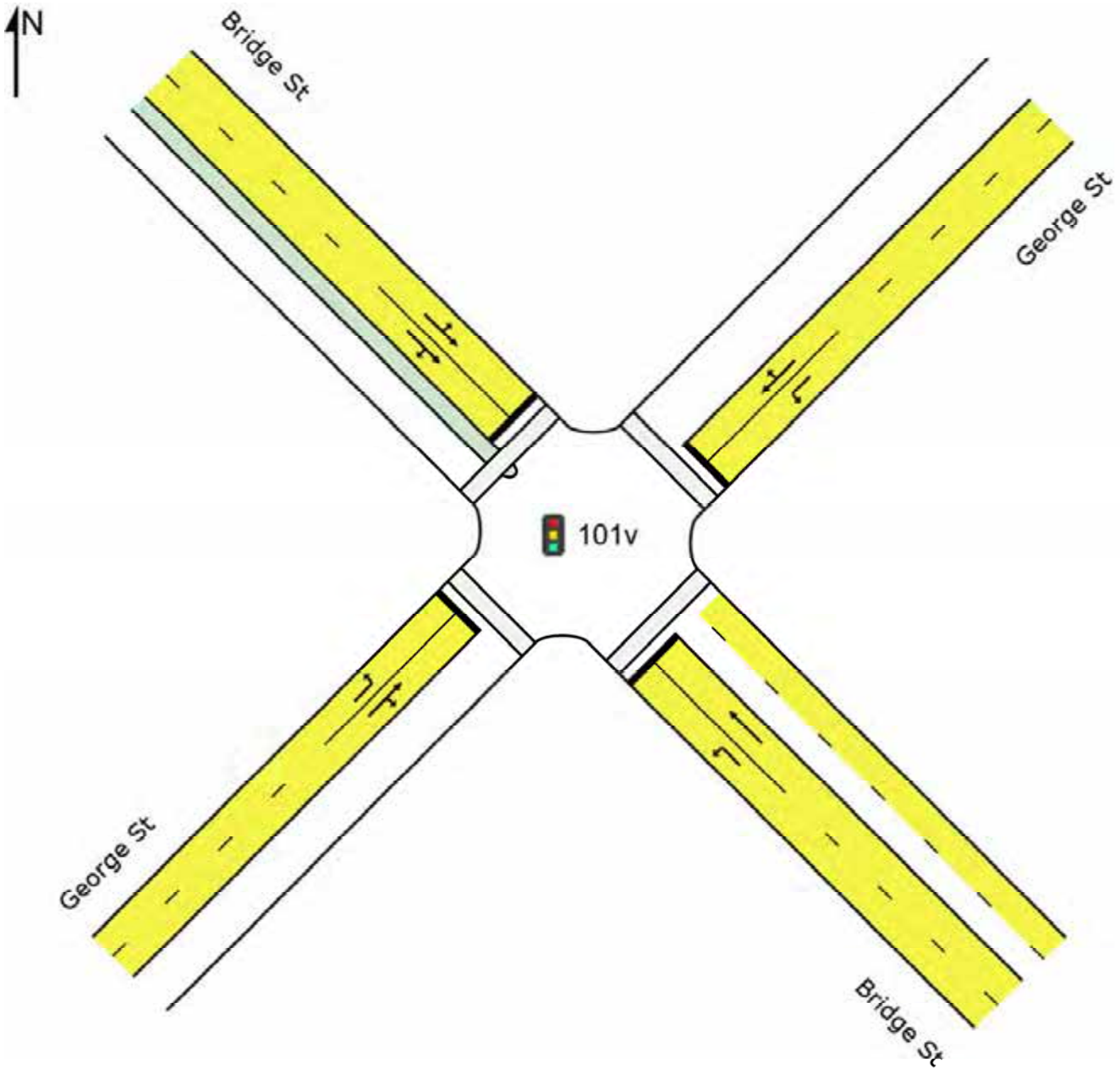
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	NorthWest Full Crossing	21	42.4	LOS E	0.1	0.1	0.92	0.92
P4	SouthWest Full Crossing	21	37.9	LOS D	0.1	0.1	0.87	0.87
All Pedestrians		42	40.1	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 101v [2027AM BC Bridge St/George St 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 101v [2027AM BC Bridge St/George St 8-9am]

Network: N101 [Windsor-2027AM BC 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	40	3.0	40	3.0	0.028	4.8	LOS A	0.0	0.3	0.02	0.53	0.02	44.2
2	T1	729	3.0	729	3.0	0.480	0.3	LOS A	1.3	9.5	0.04	0.04	0.04	49.5
Approach		769	3.0	769	3.0	0.480	0.5	LOS A	1.3	9.5	0.04	0.06	0.04	49.1
NorthEast: George St														
4	L2	1	3.0	1	3.0	0.012	55.3	LOS D	0.1	0.4	0.97	0.59	0.97	20.1
5	T1	1	3.0	1	3.0	0.022	49.8	LOS D	0.1	0.7	0.96	0.60	0.96	29.2
6	R2	1	3.0	1	3.0	0.022	54.4	LOS D	0.1	0.7	0.96	0.60	0.96	27.2
Approach		3	3.0	3	3.0	0.022	53.1	LOS D	0.1	0.7	0.96	0.60	0.96	26.0
NorthWest: Bridge St														
7	L2	28	3.0	28	3.0	0.528	7.6	LOS A	12.2	87.6	0.34	0.33	0.34	47.0
8	T1	1137	3.0	1137	3.0	0.528	3.0	LOS A	12.2	87.6	0.34	0.33	0.34	44.6
9	R2	11	3.0	11	3.0	0.528	7.7	LOS A	5.8	41.8	0.34	0.32	0.34	46.9
Approach		1176	3.0	1176	3.0	0.528	3.2	LOS A	12.2	87.6	0.34	0.33	0.34	44.8
SouthWest: George St														
10	L2	1	3.0	1	3.0	0.012	55.4	LOS D	0.1	0.4	0.97	0.59	0.97	26.3
11	T1	1	3.0	1	3.0	0.033	51.3	LOS D	0.1	0.7	0.96	0.61	0.96	28.9
12	R2	1	3.0	1	3.0	0.033	55.9	LOS D	0.1	0.7	0.96	0.61	0.96	20.5
Approach		3	3.0	3	3.0	0.033	54.2	LOS D	0.1	0.7	0.96	0.60	0.96	25.7
All Vehicles		1952	3.0	1952	3.0	0.528	2.3	LOS A	12.2	87.6	0.23	0.22	0.23	46.3

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	3.9	LOS A	0.0	0.0	0.28	0.28
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	3.4	LOS A	0.0	0.0	0.26	0.26
All Pedestrians		84	23.9	LOS C			0.61	0.61

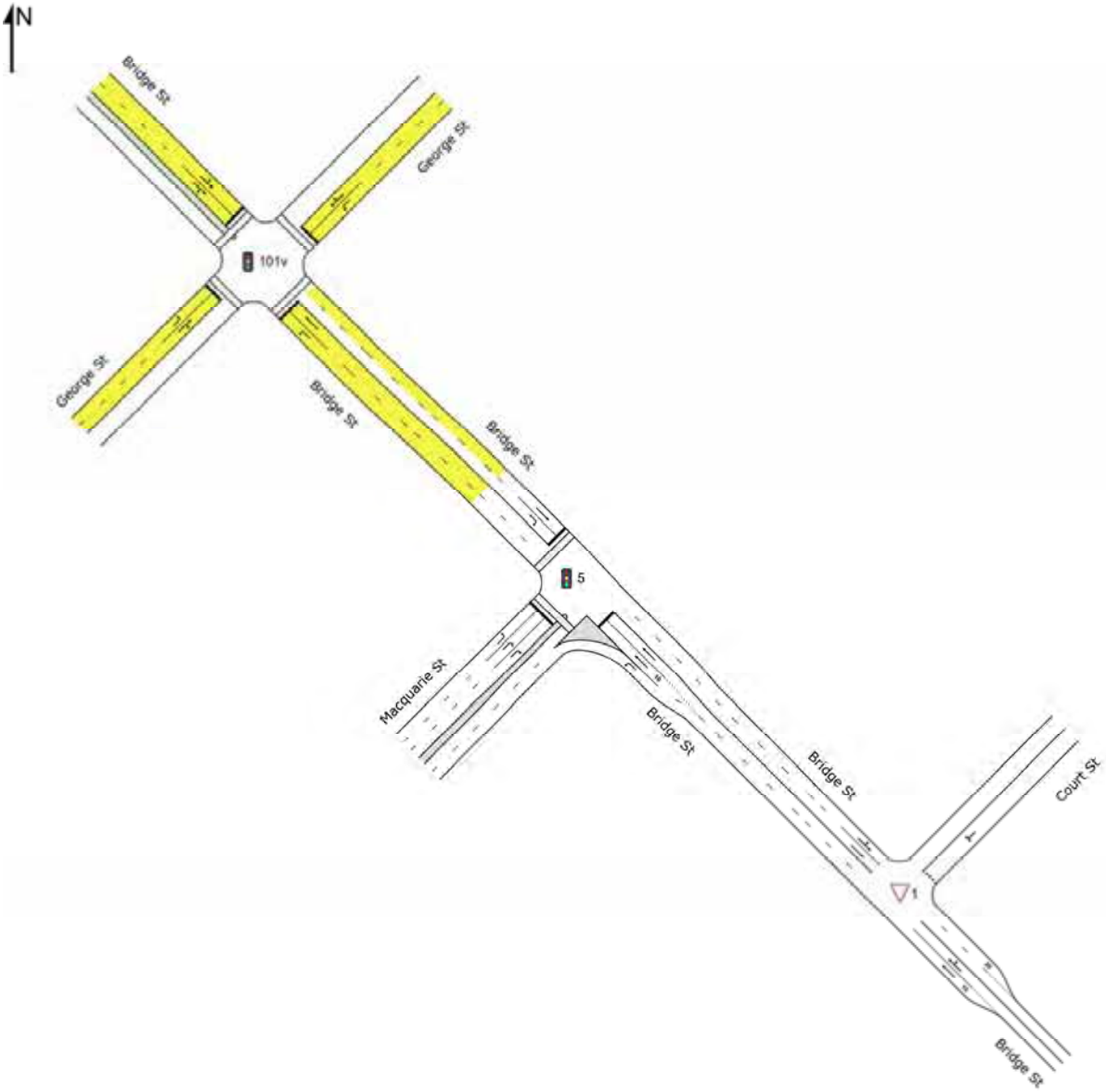
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [Windsor-2027AM S1 8-9am]

New Network
Network Category: (None)

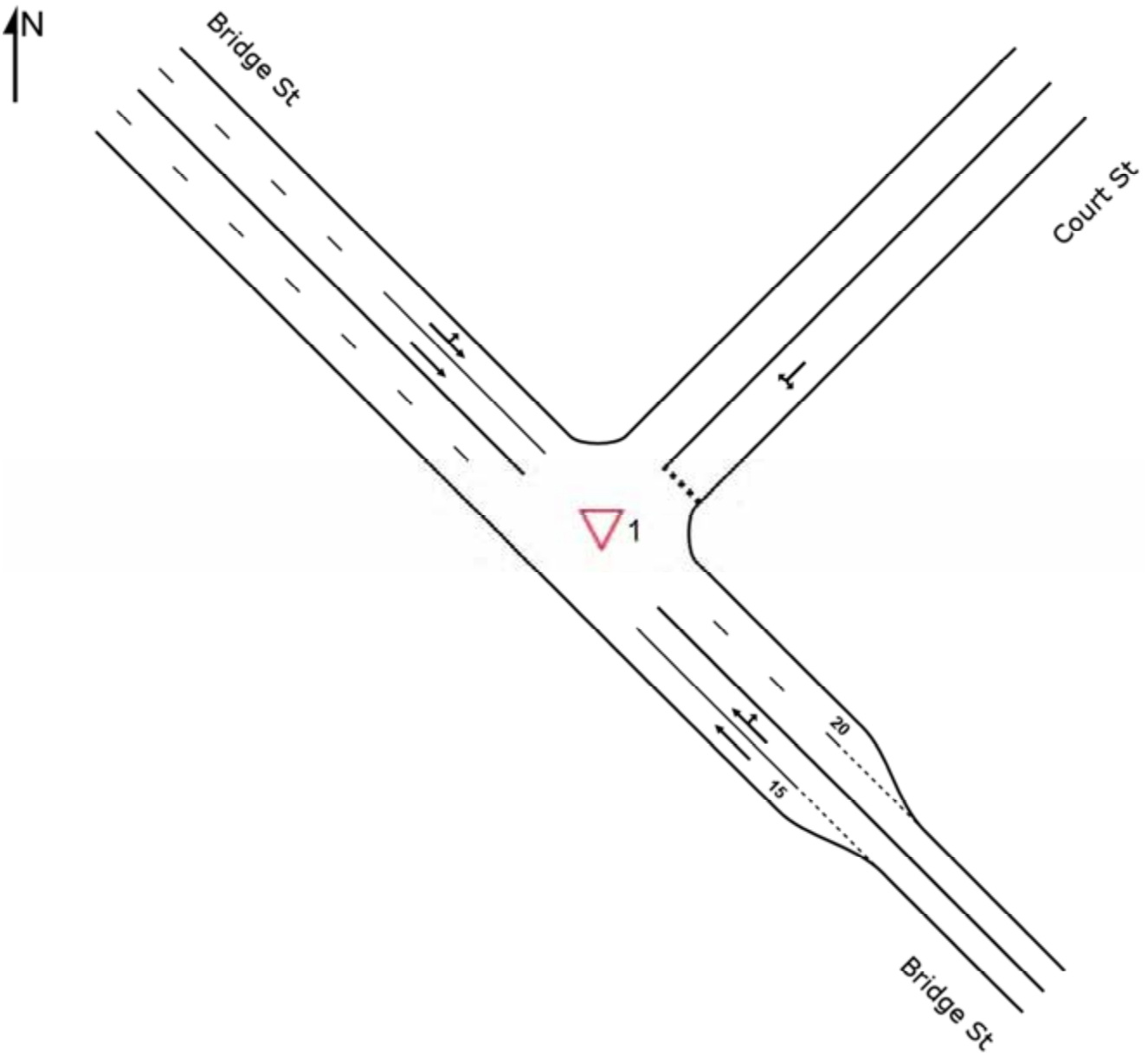


SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽1	NA	2027AM S1 Bridge St/Court St 8-9am
5	NA	2027AM S1 Macquarie St/Bridge St 8-9am
101v	NA	2027AM S1 Bridge St/George St 8-9am

SITE LAYOUT

Site: 1 [2027AM S1 Bridge St/Court St 8-9am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:32:10 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Winsdor\Windsor Br_final 20190919.sip8

MOVEMENT SUMMARY

Site: 1 [2027AM S1 Bridge St/Court St 8-9am]

Network: N101 [Windsor-2027AM S1 8-9am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

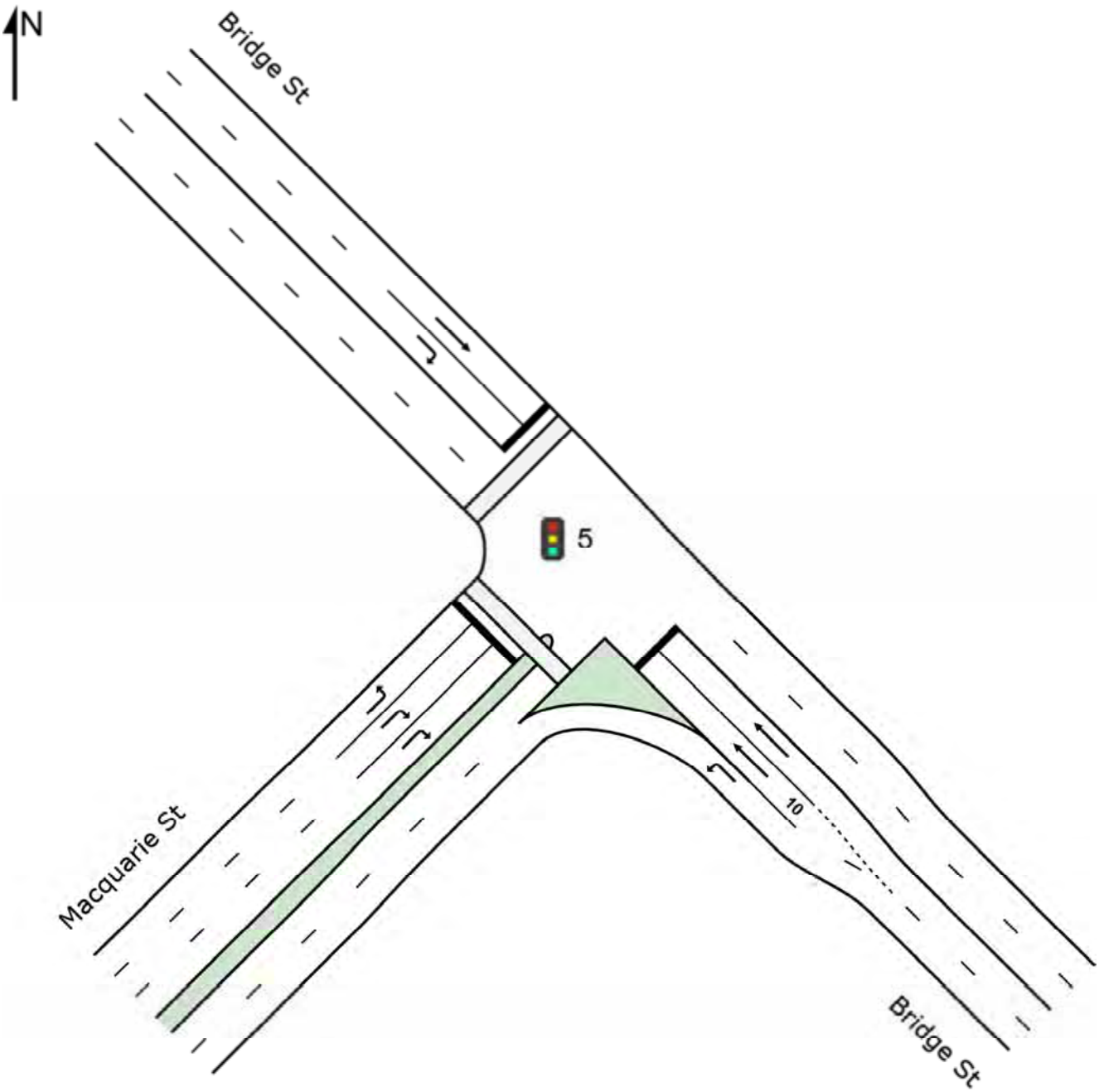
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
2	T1	985	3.0	985	3.0	0.290	1.4	LOS A	1.1	7.8	0.04	0.20	0.05	57.1
3	R2	15	3.0	15	3.0	0.290	13.2	LOS A	1.1	7.8	0.09	0.20	0.11	52.3
Approach		1000	3.0	1000	3.0	0.290	1.6	NA	1.1	7.8	0.04	0.20	0.05	56.9
NorthEast: Court St														
4	L2	5	3.0	5	3.0	0.210	6.2	LOS A	0.4	2.7	0.63	0.75	0.65	38.4
6	R2	15	3.0	15	3.0	0.210	33.5	LOS C	0.4	2.7	0.63	0.75	0.65	29.3
Approach		20	3.0	20	3.0	0.210	26.3	LOS B	0.4	2.7	0.63	0.75	0.65	32.4
NorthWest: Bridge St														
7	L2	82	3.0	82	3.0	0.098	3.9	LOS A	0.0	0.0	0.00	0.25	0.00	46.9
8	T1	938	3.0	938	3.0	0.475	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		1020	3.0	1020	3.0	0.475	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.4
All Vehicles		2040	3.0	2040	3.0	0.475	1.2	NA	1.1	7.8	0.03	0.13	0.03	52.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [2027AM S1 Macquarie St/Bridge St 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 5 [2027AM S1 Macquarie St/Bridge St 8-9am]

Network: N101 [Windsor-2027AM S1 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	559	3.0	559	3.0	0.329	4.1	LOS A	0.0	0.0	0.00	0.51	0.00	53.3
2	T1	442	3.0	442	3.0	0.911	57.6	LOS E	11.4	81.6	0.92	1.07	1.44	3.9
Approach		1001	3.0	1001	3.0	0.911	27.7	LOS B	11.4	81.6	0.41	0.76	0.64	25.8
NorthWest: Bridge St														
8	T1	679	3.0	679	3.0	0.542	0.5	LOS A	1.4	10.0	0.05	0.04	0.05	46.2
9	R2	513	3.0	513	3.0	0.764	22.0	LOS B	15.9	114.2	0.75	0.81	0.76	33.2
Approach		1192	3.0	1192	3.0	0.764	9.8	LOS A	15.9	114.2	0.35	0.37	0.36	34.8
SouthWest: Macquarie St														
10	L2	280	3.0	280	3.0	0.262	14.3	LOS A	6.0	42.9	0.47	0.71	0.47	41.1
12	R2	505	3.0	505	3.0	0.783	51.0	LOS D	12.4	88.9	0.99	0.88	1.10	22.7
Approach		785	3.0	785	3.0	0.783	37.9	LOS C	12.4	88.9	0.80	0.82	0.88	27.0
All Vehicles		2978	3.0	2978	3.0	0.911	23.2	LOS B	15.9	114.2	0.49	0.62	0.59	28.6

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

Movement Performance - Pedestrians

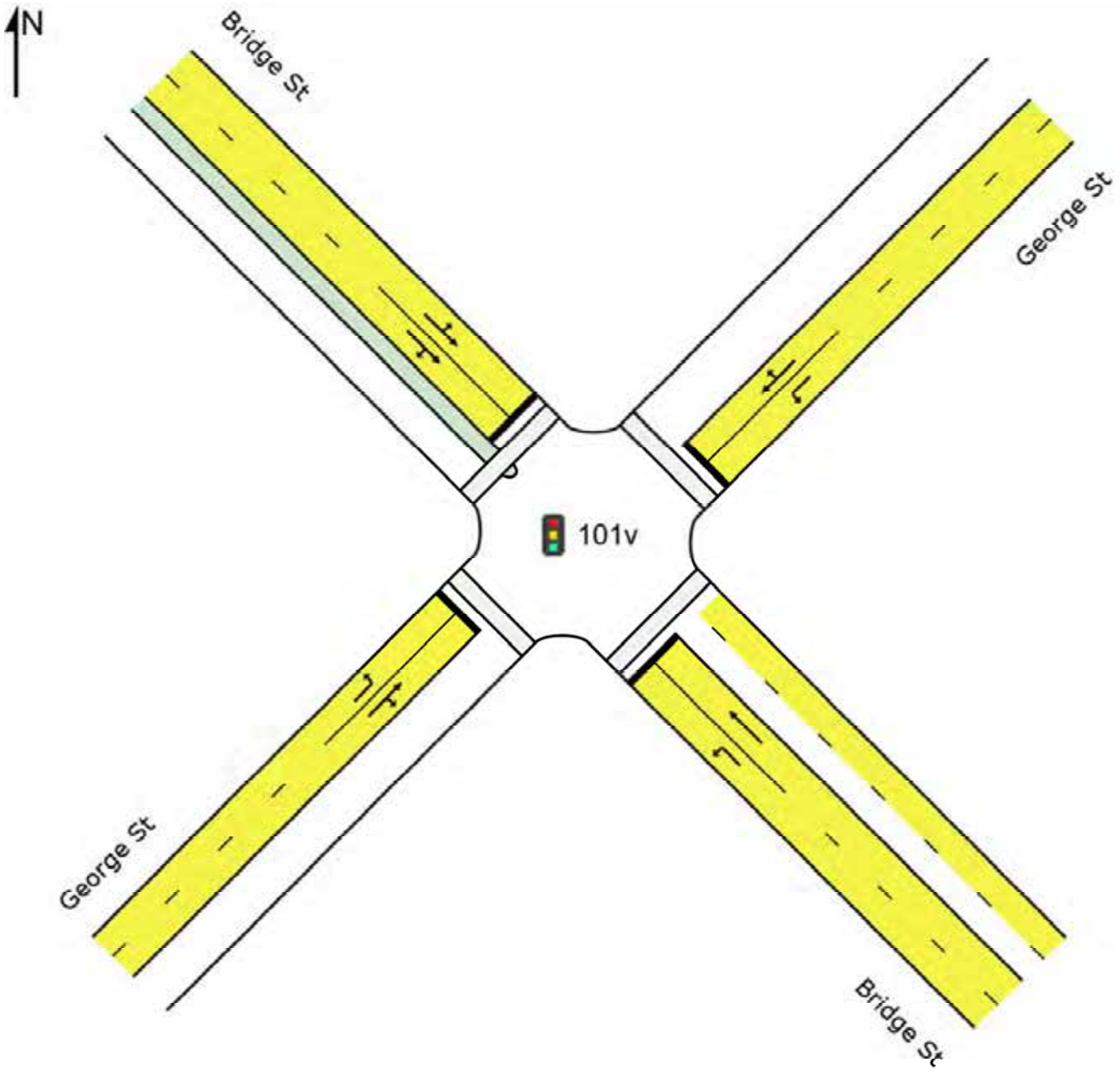
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	NorthWest Full Crossing	21	42.4	LOS E	0.1	0.1	0.92	0.92
P4	SouthWest Full Crossing	21	39.6	LOS D	0.1	0.1	0.89	0.89
All Pedestrians		42	41.0	LOS E			0.91	0.91

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 101v [2027AM S1 Bridge St/George St 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 101v [2027AM S1 Bridge St/George St 8-9am]

Network: N101 [Windsor-2027AM S1 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bridge St														
1	L2	28	3.0	28	3.0	0.020	4.8	LOS A	0.0	0.2	0.02	0.53	0.02	44.2
2	T1	692	3.0	692	3.0	0.455	0.3	LOS A	1.2	8.6	0.04	0.04	0.04	49.5
Approach		720	3.0	720	3.0	0.455	0.5	LOS A	1.2	8.6	0.04	0.06	0.04	49.2
NorthEast: George St														
4	L2	1	3.0	1	3.0	0.012	55.3	LOS D	0.1	0.4	0.97	0.59	0.97	20.1
5	T1	1	3.0	1	3.0	0.022	49.8	LOS D	0.1	0.7	0.96	0.60	0.96	29.2
6	R2	1	3.0	1	3.0	0.022	54.4	LOS D	0.1	0.7	0.96	0.60	0.96	27.2
Approach		3	3.0	3	3.0	0.022	53.1	LOS D	0.1	0.7	0.96	0.60	0.96	26.0
NorthWest: Bridge St														
7	L2	26	3.0	26	3.0	0.580	7.9	LOS A	14.5	104.1	0.37	0.36	0.37	46.8
8	T1	1183	3.0	1183	3.0	0.580	3.3	LOS A	14.5	104.1	0.37	0.36	0.37	44.1
9	R2	42	3.0	42	3.0	0.580	8.0	LOS A	6.3	45.0	0.37	0.38	0.37	46.5
Approach		1252	3.0	1252	3.0	0.580	3.5	LOS A	14.5	104.1	0.37	0.36	0.37	44.4
SouthWest: George St														
10	L2	1	3.0	1	3.0	0.012	55.4	LOS D	0.1	0.4	0.97	0.59	0.97	26.3
11	T1	1	3.0	1	3.0	0.033	51.3	LOS D	0.1	0.7	0.96	0.61	0.96	28.9
12	R2	1	3.0	1	3.0	0.033	55.9	LOS D	0.1	0.7	0.96	0.61	0.96	20.5
Approach		3	3.0	3	3.0	0.033	54.2	LOS D	0.1	0.7	0.96	0.60	0.96	25.7
All Vehicles		1978	3.0	1978	3.0	0.580	2.6	LOS A	14.5	104.1	0.25	0.25	0.25	45.9

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	3.9	LOS A	0.0	0.0	0.28	0.28
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	3.4	LOS A	0.0	0.0	0.26	0.26
All Pedestrians		84	23.9	LOS C			0.61	0.61

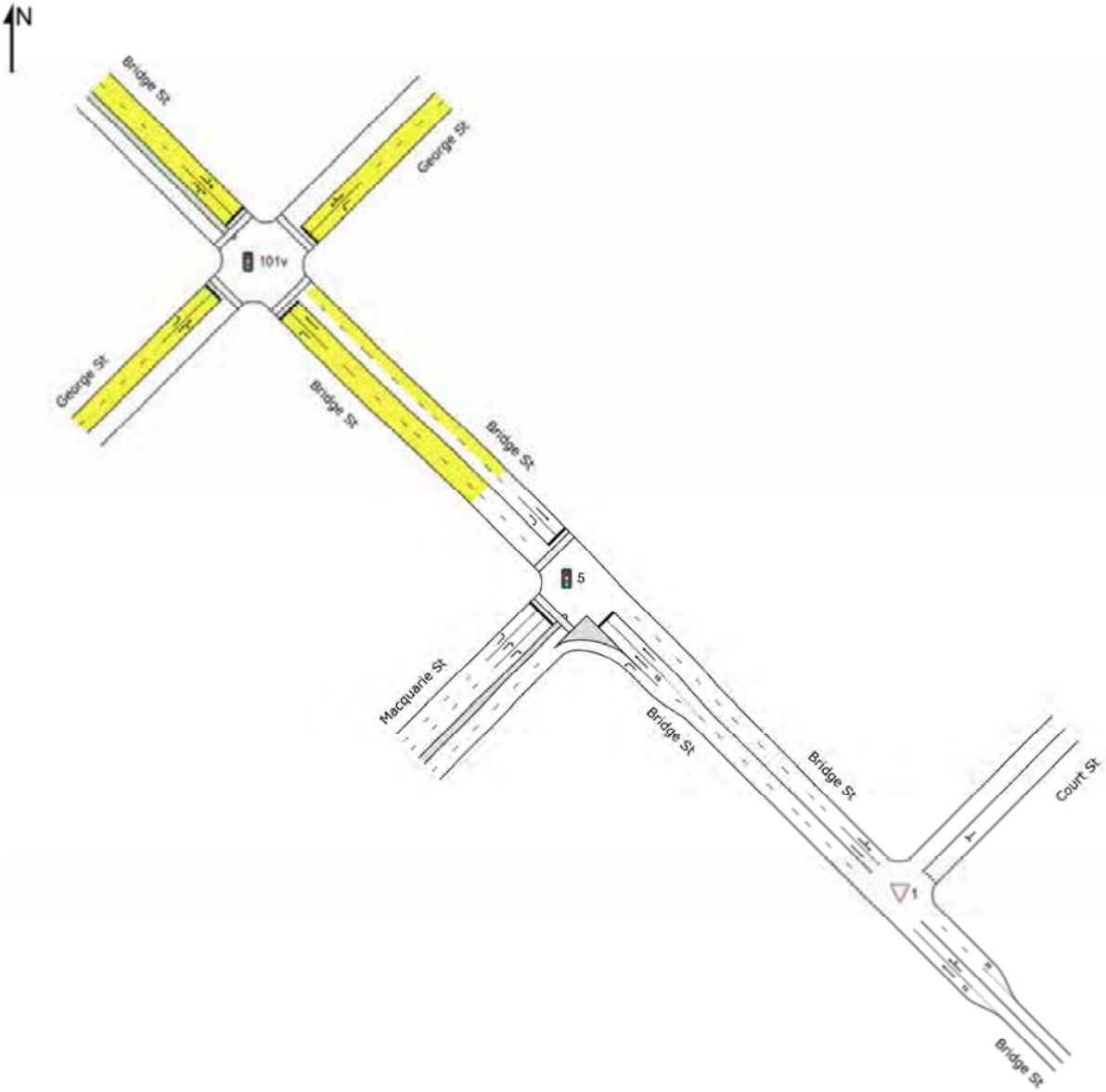
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [Windsor-2027AM S2 8-9am]

New Network
Network Category: (None)

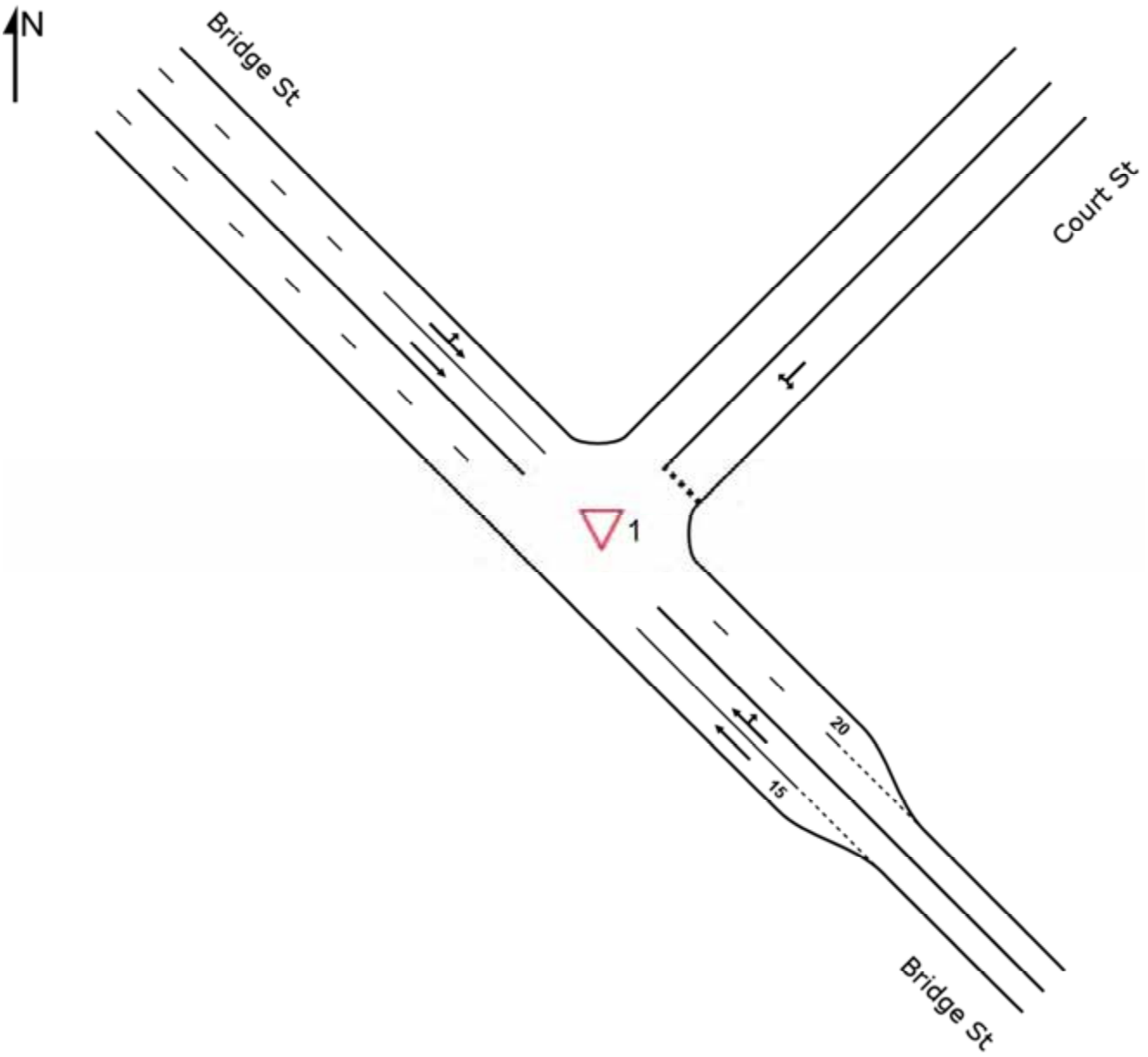


SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽1	NA	2027AM S2 Bridge St/Court St 8-9am
5	NA	2027AM S2 Macquarie St/Bridge St 8-9am
101v	NA	2027AM S2 Bridge St/George St 8-9am

SITE LAYOUT

Site: 1 [2027AM S2 Bridge St/Court St 8-9am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:33:49 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Winsdor\Windsor Br_final 20190919.sip8

MOVEMENT SUMMARY

Site: 1 [2027AM S2 Bridge St/Court St 8-9am]

Network: N101 [Windsor-2027AM S2 8-9am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

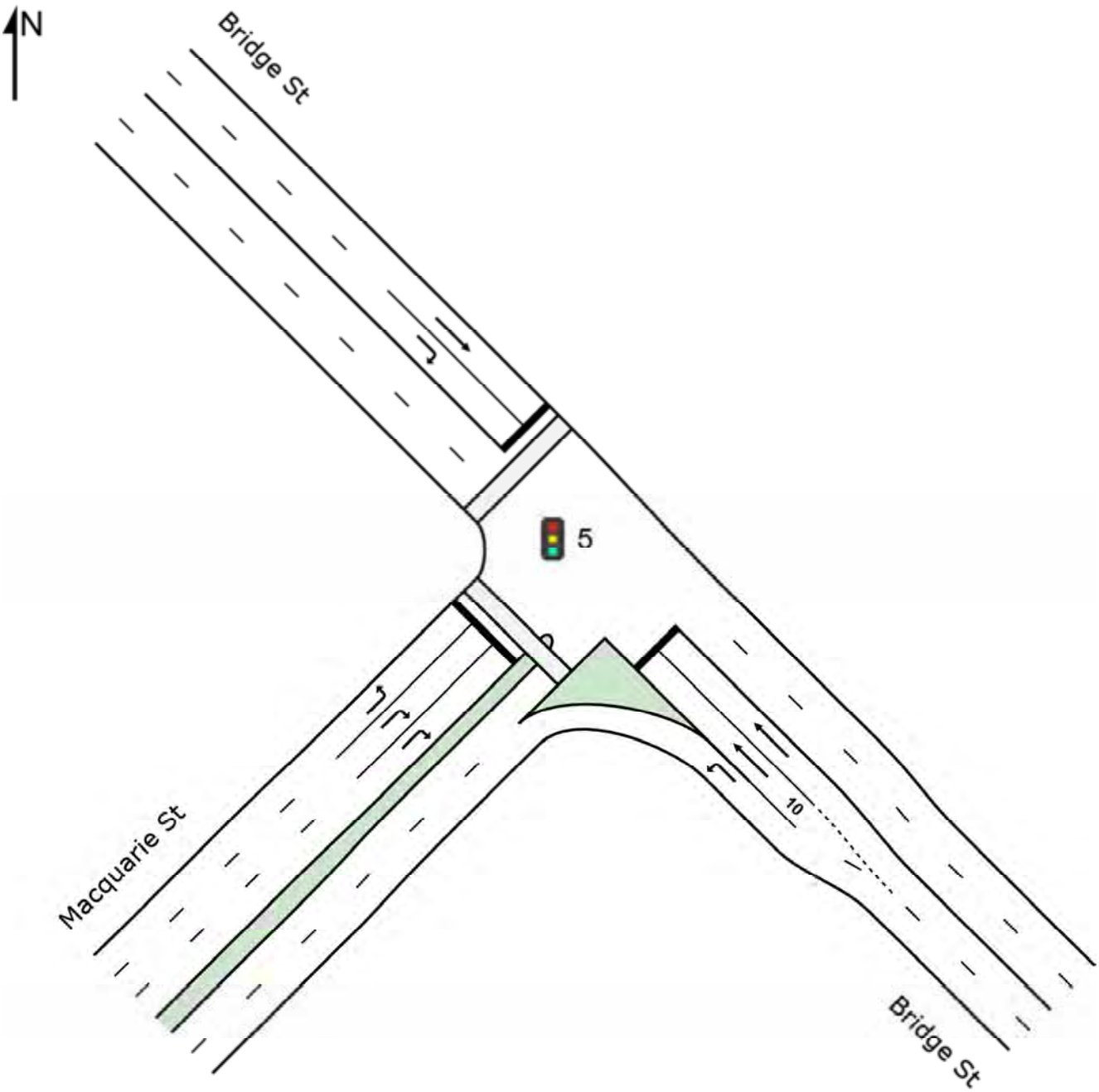
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
2	T1	1048	3.0	1048	3.0	0.318	1.6	LOS A	1.2	8.4	0.07	0.20	0.09	56.6
3	R2	27	3.0	27	3.0	0.318	13.0	LOS A	1.2	8.4	0.15	0.20	0.19	51.8
Approach		1076	3.0	1076	3.0	0.318	1.9	NA	1.2	8.4	0.07	0.20	0.09	56.3
NorthEast: Court St														
4	L2	1	3.0	1	3.0	0.237	7.9	LOS A	0.4	2.7	0.83	0.91	0.88	35.4
6	R2	15	3.0	15	3.0	0.237	36.3	LOS C	0.4	2.7	0.83	0.91	0.88	26.0
Approach		16	3.0	16	3.0	0.237	34.4	LOS C	0.4	2.7	0.83	0.91	0.88	26.8
NorthWest: Bridge St														
7	L2	81	3.0	81	3.0	0.094	3.9	LOS A	0.0	0.0	0.00	0.26	0.00	46.9
8	T1	898	3.0	898	3.0	0.456	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		979	3.0	979	3.0	0.456	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.4
All Vehicles		2071	3.0	2071	3.0	0.456	1.4	NA	1.2	8.4	0.04	0.13	0.05	52.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [2027AM S2 Macquarie St/Bridge St 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 5 [2027AM S2 Macquarie St/Bridge St 8-9am]

Network: N101 [Windsor-2027AM S2 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	606	3.0	606	3.0	0.357	4.1	LOS A	0.0	0.0	0.00	0.51	0.00	53.3
2	T1	455	3.0	455	3.0	0.902	55.1	LOS D	11.4	81.6	0.91	1.05	1.39	4.1
Approach		1061	3.0	1061	3.0	0.902	26.0	LOS B	11.4	81.6	0.39	0.74	0.60	27.0
NorthWest: Bridge St														
8	T1	588	3.0	588	3.0	0.477	0.5	LOS A	1.1	7.6	0.04	0.04	0.04	46.3
9	R2	476	3.0	476	3.0	0.747	23.4	LOS B	15.9	114.2	0.76	0.81	0.78	32.5
Approach		1064	3.0	1064	3.0	0.747	10.7	LOS A	15.9	114.2	0.36	0.38	0.37	34.1
SouthWest: Macquarie St														
10	L2	252	3.0	252	3.0	0.239	14.6	LOS B	5.4	38.8	0.48	0.71	0.48	40.8
12	R2	509	3.0	509	3.0	0.750	49.0	LOS D	12.1	86.9	0.97	0.87	1.05	23.3
Approach		761	3.0	761	3.0	0.750	37.6	LOS C	12.1	86.9	0.81	0.81	0.86	27.1
All Vehicles		2886	3.0	2886	3.0	0.902	23.4	LOS B	15.9	114.2	0.49	0.63	0.58	28.8

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

Movement Performance - Pedestrians

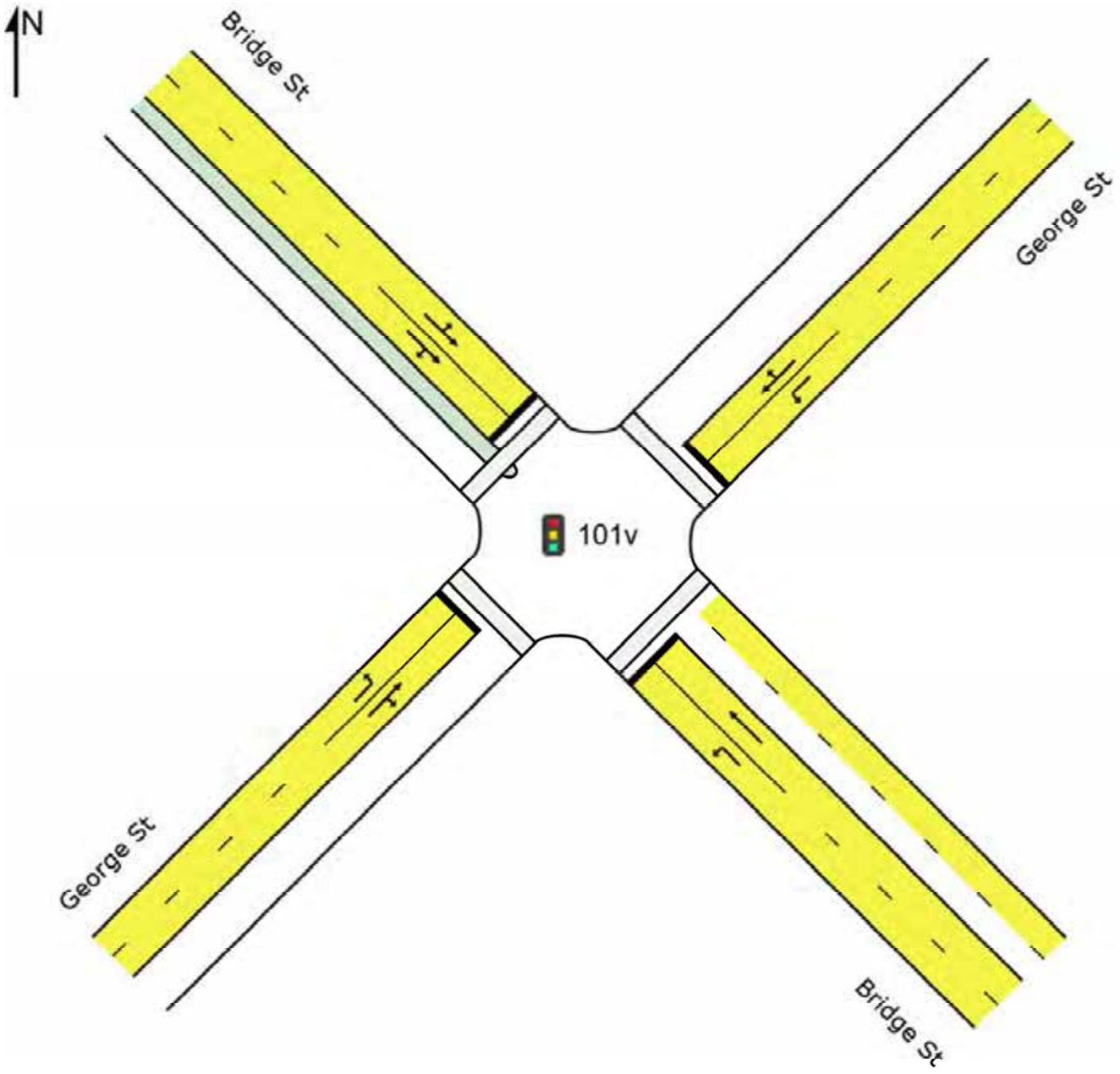
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	NorthWest Full Crossing	21	41.4	LOS E	0.1	0.1	0.91	0.91
P4	SouthWest Full Crossing	21	38.8	LOS D	0.1	0.1	0.88	0.88
All Pedestrians		42	40.1	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 101v [2027AM S2 Bridge St/George St 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 101v [2027AM S2 Bridge St/George St 8-9am]

Network: N101 [Windsor-2027AM S2 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bridge St														
1	L2	33	3.0	33	3.0	0.023	4.8	LOS A	0.0	0.2	0.02	0.53	0.02	44.2
2	T1	674	3.0	674	3.0	0.444	0.3	LOS A	1.1	8.2	0.04	0.03	0.04	49.5
Approach		706	3.0	706	3.0	0.444	0.5	LOS A	1.1	8.2	0.04	0.06	0.04	49.2
NorthEast: George St														
4	L2	1	3.0	1	3.0	0.012	55.3	LOS D	0.1	0.4	0.97	0.59	0.97	20.1
5	T1	1	3.0	1	3.0	0.022	49.8	LOS D	0.1	0.7	0.96	0.60	0.96	29.2
6	R2	1	3.0	1	3.0	0.022	54.4	LOS D	0.1	0.7	0.96	0.60	0.96	27.2
Approach		3	3.0	3	3.0	0.022	53.1	LOS D	0.1	0.7	0.96	0.60	0.96	26.0
NorthWest: Bridge St														
7	L2	34	3.0	34	3.0	0.535	7.6	LOS A	12.5	89.6	0.35	0.34	0.35	47.0
8	T1	1063	3.0	1063	3.0	0.535	3.1	LOS A	12.5	89.6	0.35	0.34	0.35	44.3
9	R2	48	3.0	48	3.0	0.535	7.7	LOS A	5.3	37.8	0.35	0.37	0.35	46.5
Approach		1145	3.0	1145	3.0	0.535	3.4	LOS A	12.5	89.6	0.35	0.34	0.35	44.7
SouthWest: George St														
10	L2	1	3.0	1	3.0	0.012	55.4	LOS D	0.1	0.4	0.97	0.59	0.97	26.3
11	T1	1	3.0	1	3.0	0.033	51.3	LOS D	0.1	0.7	0.96	0.61	0.96	28.9
12	R2	1	3.0	1	3.0	0.033	55.9	LOS D	0.1	0.7	0.96	0.61	0.96	20.5
Approach		3	3.0	3	3.0	0.033	54.2	LOS D	0.1	0.7	0.96	0.60	0.96	25.7
All Vehicles		1858	3.0	1858	3.0	0.535	2.5	LOS A	12.5	89.6	0.23	0.24	0.23	46.1

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	3.9	LOS A	0.0	0.0	0.28	0.28
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	3.4	LOS A	0.0	0.0	0.26	0.26
All Pedestrians		84	23.9	LOS C			0.61	0.61

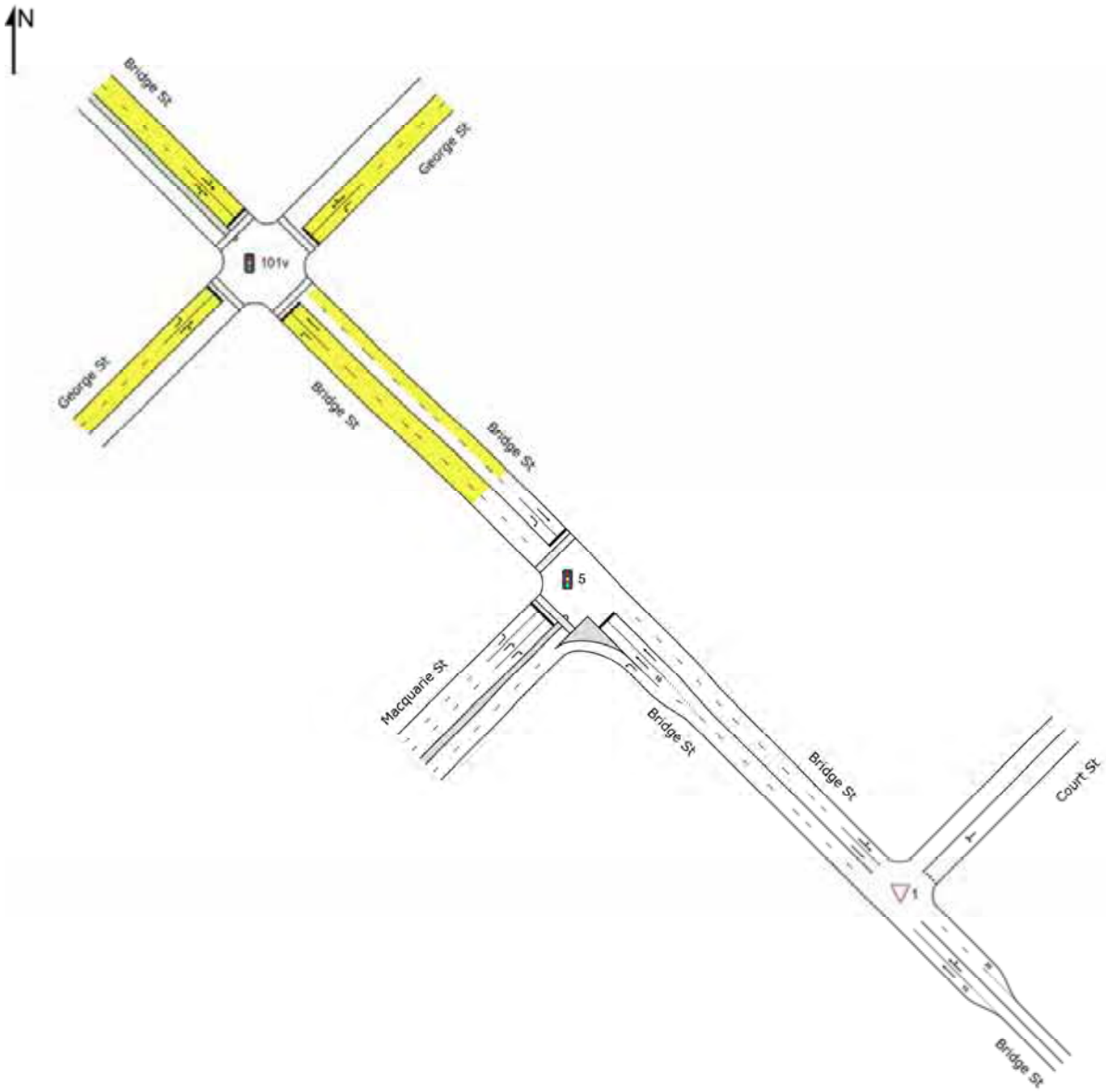
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [Windsor-2027AM S3 8-9am]

New Network
Network Category: (None)

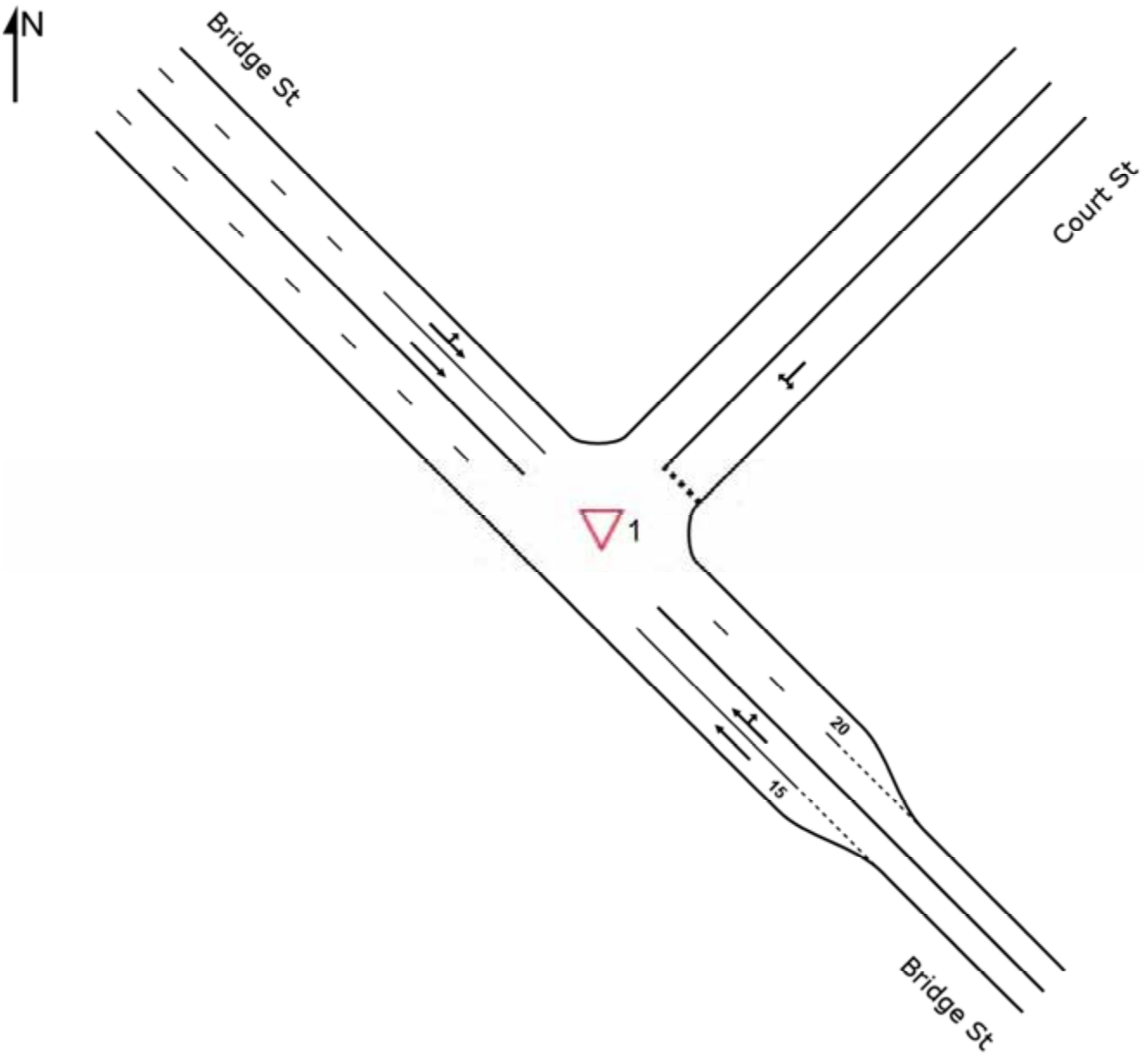


SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽1	NA	2027AM S3 Bridge St/Court St 8-9am
5	NA	2027AM S3 Macquarie St/Bridge St 8-9am
101v	NA	2027AM S3 Bridge St/George St 8-9am

SITE LAYOUT

Site: 1 [2027AM S3 Bridge St/Court St 8-9am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:35:24 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Winsdor\Windsor Br_final 20190919.sip8

MOVEMENT SUMMARY

Site: 1 [2027AM S3 Bridge St/Court St 8-9am]

Network: N101 [Windsor-2027AM S3 8-9am]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

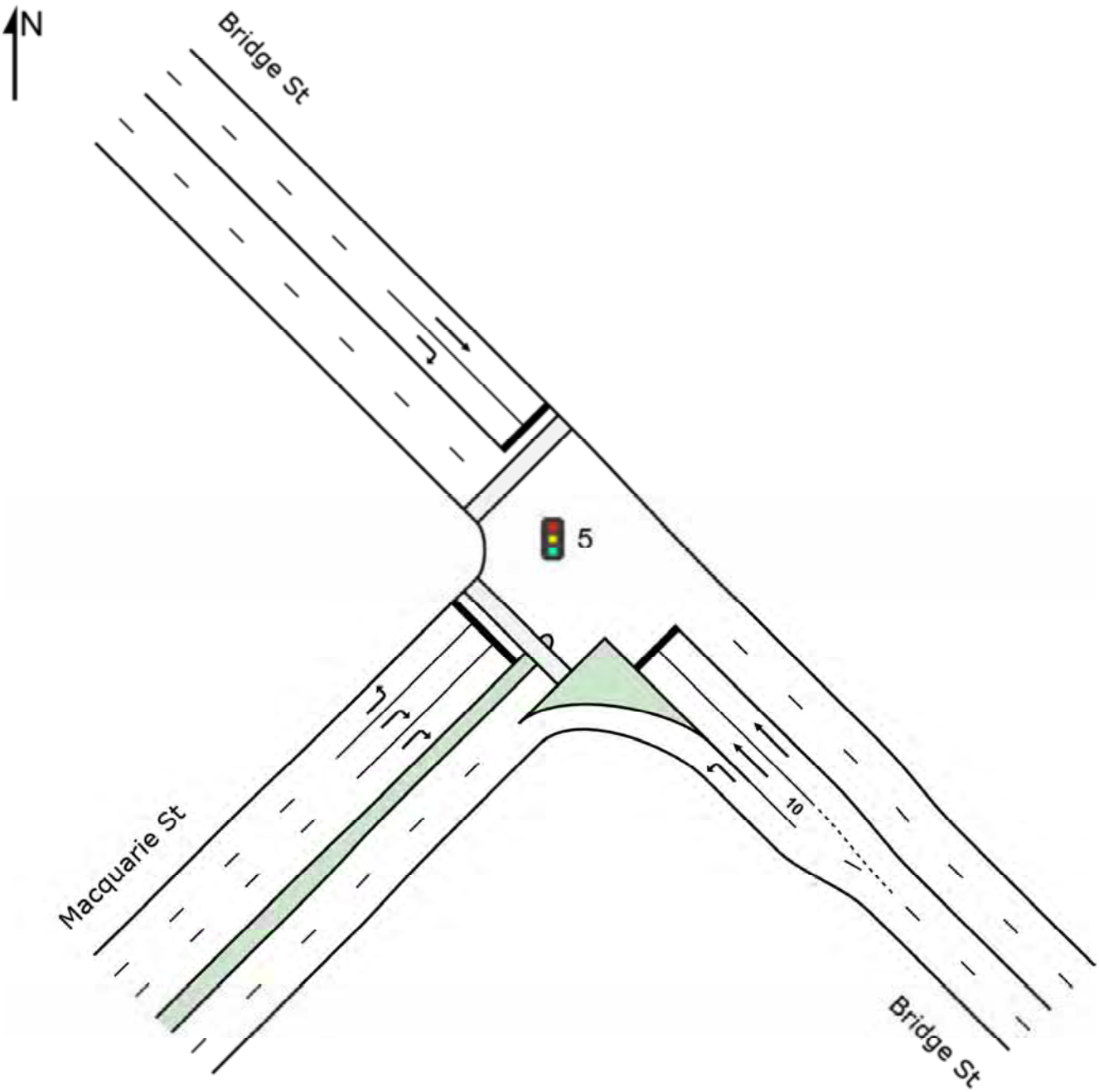
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
2	T1	991	3.0	991	3.0	0.300	1.6	LOS A	0.6	4.5	0.07	0.20	0.08	56.7
3	R2	26	3.0	26	3.0	0.300	12.4	LOS A	0.6	4.5	0.14	0.20	0.17	51.9
Approach		1017	3.0	1017	3.0	0.300	1.8	NA	0.6	4.5	0.07	0.20	0.08	56.4
NorthEast: Court St														
4	L2	1	3.0	1	3.0	0.214	6.8	LOS A	0.3	2.4	0.82	0.90	0.85	36.7
6	R2	15	3.0	15	3.0	0.214	32.2	LOS C	0.3	2.4	0.82	0.90	0.85	27.4
Approach		16	3.0	16	3.0	0.214	30.5	LOS C	0.3	2.4	0.82	0.90	0.85	28.3
NorthWest: Bridge St														
7	L2	74	3.0	74	3.0	0.091	3.9	LOS A	0.0	0.0	0.00	0.25	0.00	47.0
8	T1	873	3.0	873	3.0	0.441	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		946	3.0	946	3.0	0.441	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.5
All Vehicles		1979	3.0	1979	3.0	0.441	1.3	NA	0.6	4.5	0.04	0.13	0.05	52.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [2027AM S3 Macquarie St/Bridge St 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 5 [2027AM S3 Macquarie St/Bridge St 8-9am]

Network: N101 [Windsor-2027AM S3 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	567	3.0	567	3.0	0.334	4.1	LOS A	0.0	0.0	0.00	0.51	0.00	53.3
2	T1	437	3.0	437	3.0	0.898	54.7	LOS D	11.4	81.6	0.92	1.04	1.39	4.1
Approach		1004	3.0	1004	3.0	0.898	26.1	LOS B	11.4	81.6	0.40	0.74	0.61	26.8
NorthWest: Bridge St														
8	T1	582	3.0	582	3.0	0.472	0.5	LOS A	1.0	7.5	0.04	0.04	0.04	46.4
9	R2	457	3.0	457	3.0	0.699	21.5	LOS B	14.7	105.8	0.70	0.79	0.70	33.4
Approach		1039	3.0	1039	3.0	0.699	9.7	LOS A	14.7	105.8	0.33	0.37	0.33	35.0
SouthWest: Macquarie St														
10	L2	252	3.0	252	3.0	0.235	14.1	LOS A	5.3	37.7	0.46	0.71	0.46	41.2
12	R2	489	3.0	489	3.0	0.721	48.1	LOS D	11.4	81.8	0.96	0.85	1.02	23.5
Approach		741	3.0	741	3.0	0.721	36.6	LOS C	11.4	81.8	0.79	0.80	0.83	27.5
All Vehicles		2784	3.0	2784	3.0	0.898	22.8	LOS B	14.7	105.8	0.48	0.62	0.56	29.1

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

Movement Performance - Pedestrians

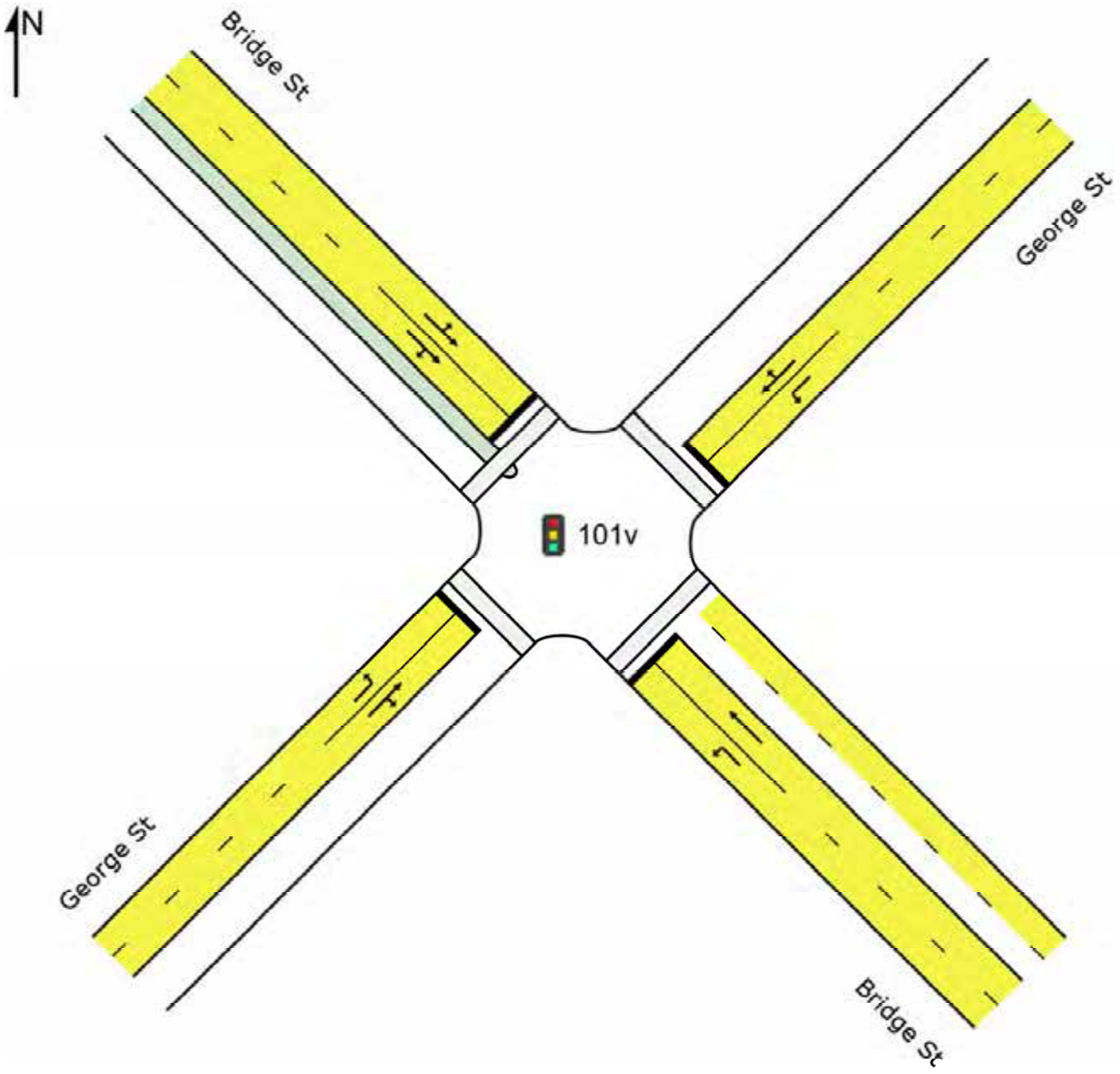
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	NorthWest Full Crossing	21	41.4	LOS E	0.1	0.1	0.91	0.91
P4	SouthWest Full Crossing	21	39.6	LOS D	0.1	0.1	0.89	0.89
All Pedestrians		42	40.5	LOS E			0.90	0.90

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 101v [2027AM S3 Bridge St/George St 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 101v [2027AM S3 Bridge St/George St 8-9am]

Network: N101 [Windsor-2027AM S3 8-9am]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bridge St														
1	L2	41	3.0	41	3.0	0.029	4.8	LOS A	0.0	0.3	0.02	0.53	0.02	44.2
2	T1	647	3.0	647	3.0	0.426	0.3	LOS A	1.1	7.6	0.04	0.03	0.04	49.5
Approach		688	3.0	688	3.0	0.426	0.6	LOS A	1.1	7.6	0.04	0.06	0.04	49.1
NorthEast: George St														
4	L2	1	3.0	1	3.0	0.012	55.3	LOS D	0.1	0.4	0.97	0.59	0.97	20.1
5	T1	1	3.0	1	3.0	0.022	49.8	LOS D	0.1	0.7	0.96	0.60	0.96	29.2
6	R2	1	3.0	1	3.0	0.022	54.4	LOS D	0.1	0.7	0.96	0.60	0.96	27.2
Approach		3	3.0	3	3.0	0.022	53.1	LOS D	0.1	0.7	0.96	0.60	0.96	26.0
NorthWest: Bridge St														
7	L2	38	3.0	38	3.0	0.497	7.5	LOS A	11.0	78.8	0.33	0.32	0.33	47.1
8	T1	1028	3.0	1028	3.0	0.497	2.9	LOS A	11.0	78.8	0.33	0.33	0.33	44.5
9	R2	46	3.0	46	3.0	0.497	7.5	LOS A	5.3	38.3	0.33	0.34	0.33	46.7
Approach		1113	3.0	1113	3.0	0.497	3.3	LOS A	11.0	78.8	0.33	0.33	0.33	44.9
SouthWest: George St														
10	L2	1	3.0	1	3.0	0.012	55.4	LOS D	0.1	0.4	0.97	0.59	0.97	26.3
11	T1	1	3.0	1	3.0	0.030	51.0	LOS D	0.1	0.7	0.96	0.61	0.96	28.9
12	R2	1	3.0	1	3.0	0.030	55.6	LOS D	0.1	0.7	0.96	0.61	0.96	20.6
Approach		3	3.0	3	3.0	0.030	54.0	LOS D	0.1	0.7	0.96	0.60	0.96	25.8
All Vehicles		1807	3.0	1807	3.0	0.497	2.4	LOS A	11.0	78.8	0.22	0.23	0.22	46.2

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

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	3.9	LOS A	0.0	0.0	0.28	0.28
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	3.4	LOS A	0.0	0.0	0.26	0.26
All Pedestrians		84	23.9	LOS C			0.61	0.61

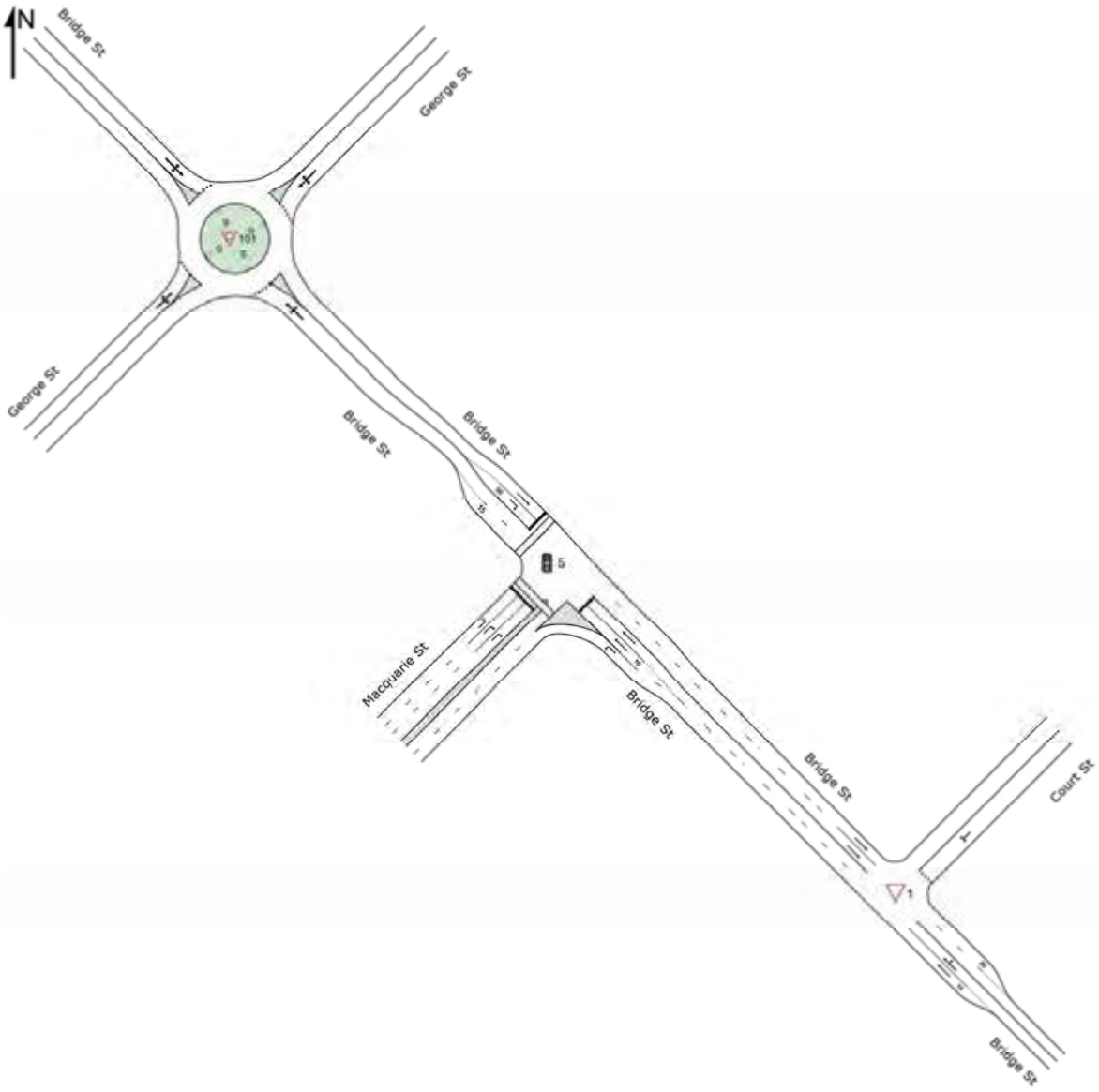
Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [Windsor-2018PM BC 15-16pm]

New Network
Network Category: (None)

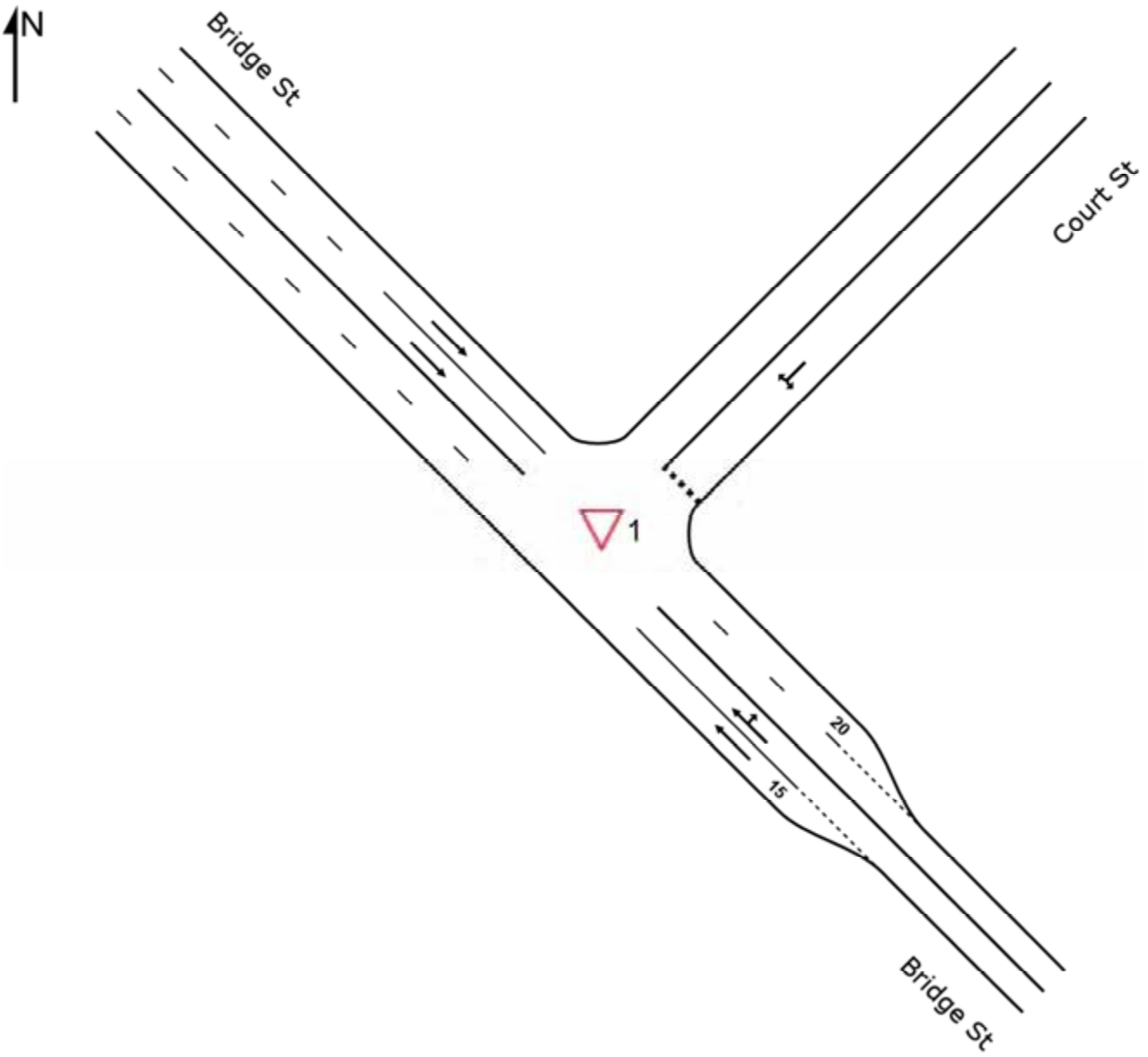


SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
1	NA	2018PM BC Bridge St/Court St 15-16pm
5	NA	2018PM BC Macquarie St/Bridge St 15-16pm
101	NA	2018PM BC Bridge St/George St 15-16pm

SITE LAYOUT

Site: 1 [2018PM BC Bridge St/Court St 15-16pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)



MOVEMENT SUMMARY

Site: 1 [2018PM BC Bridge St/Court St 15-16pm]

Network: N101 [Windsor-2018PM BC 15-16pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

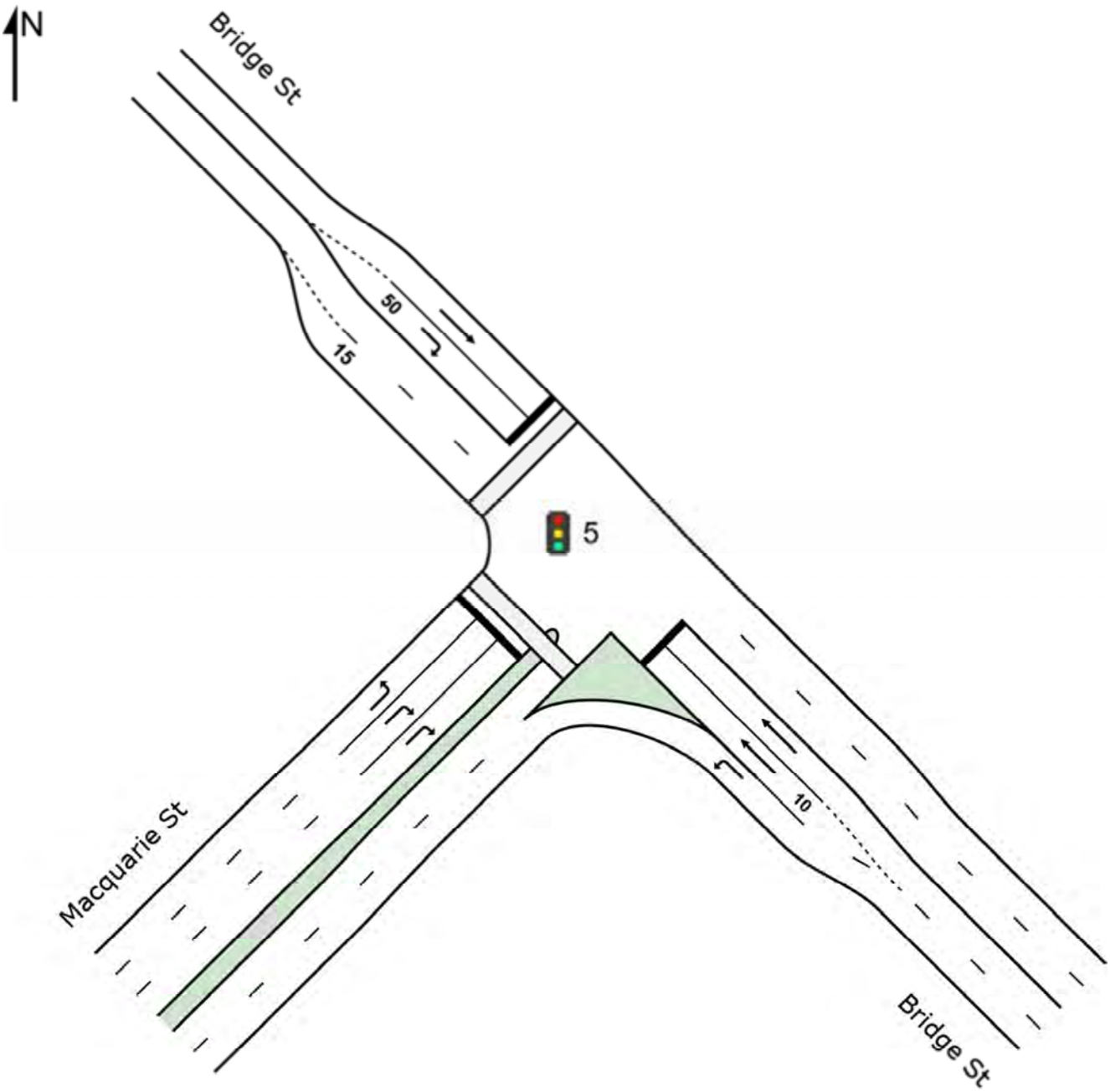
Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
2	T1	1013	7.0	1013	7.0	0.337	0.8	LOS A	59.3	440.2	0.12	0.03	0.15	57.5
3	R2	55	7.7	55	7.7	0.337	12.6	LOS A	59.3	440.2	0.27	0.08	0.35	51.4
Approach		1067	7.0	1067	7.0	0.337	1.4	NA	59.3	440.2	0.12	0.04	0.16	56.9
NorthEast: Court St														
4	L2	6	0.0	6	0.0	0.039	5.1	LOS A	0.1	0.6	0.44	0.59	0.44	44.5
6	R2	3	0.0	3	0.0	0.039	29.8	LOS C	0.1	0.6	0.44	0.59	0.44	36.8
Approach		9	0.0	9	0.0	0.039	13.3	LOS A	0.1	0.6	0.44	0.59	0.44	42.7
NorthWest: Bridge St														
8	T1	880	6.2	880	6.2	0.417	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		880	6.2	880	6.2	0.417	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1957	6.6	1957	6.6	0.417	0.8	NA	59.3	440.2	0.07	0.02	0.09	58.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

SITE LAYOUT

Site: 5 [2018PM BC Macquarie St/Bridge St 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:37:38 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Winsdor\Windsor Br_final 20190919.sip8

MOVEMENT SUMMARY

Site: 5 [2018PM BC Macquarie St/Bridge St 15-16pm]

Network: N101 [Windsor-2018PM BC 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Site User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	426	6.2	426	6.2	0.257	4.1	LOS A	0.0	0.0	0.00	0.51	0.00	53.1
2	T1	589	7.5	589	7.5	1.469	327.6	LOS F	11.0	81.6	0.85	1.94	2.97	0.7
Approach		1016	6.9	1016	6.9	1.469	191.8	LOS F	11.0	81.6	0.50	1.34	1.72	4.8
NorthWest: Bridge St														
8	T1	344	9.5	344	9.5	0.282	5.9	LOS A	6.2	46.7	0.40	0.35	0.40	28.3
9	R2	254	7.5	254	7.5	0.973	82.6	LOS F	15.3	114.2	1.00	1.27	2.22	17.7
Approach		598	8.6	598	8.6	0.973	38.5	LOS C	15.3	114.2	0.66	0.74	1.17	18.9
SouthWest: Macquarie St														
10	L2	425	10.4	425	10.4	0.752	38.6	LOS C	19.2	146.2	0.94	0.88	0.99	26.7
12	R2	536	4.1	536	4.1	0.883	58.4	LOS E	14.6	105.7	1.00	0.96	1.28	20.8
Approach		961	6.9	961	6.9	0.883	49.7	LOS D	19.2	146.2	0.98	0.92	1.15	23.1
All Vehicles		2575	7.3	2575	7.3	1.469	103.2	LOS F	19.2	146.2	0.71	1.04	1.38	10.6

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

Movement Performance - Pedestrians

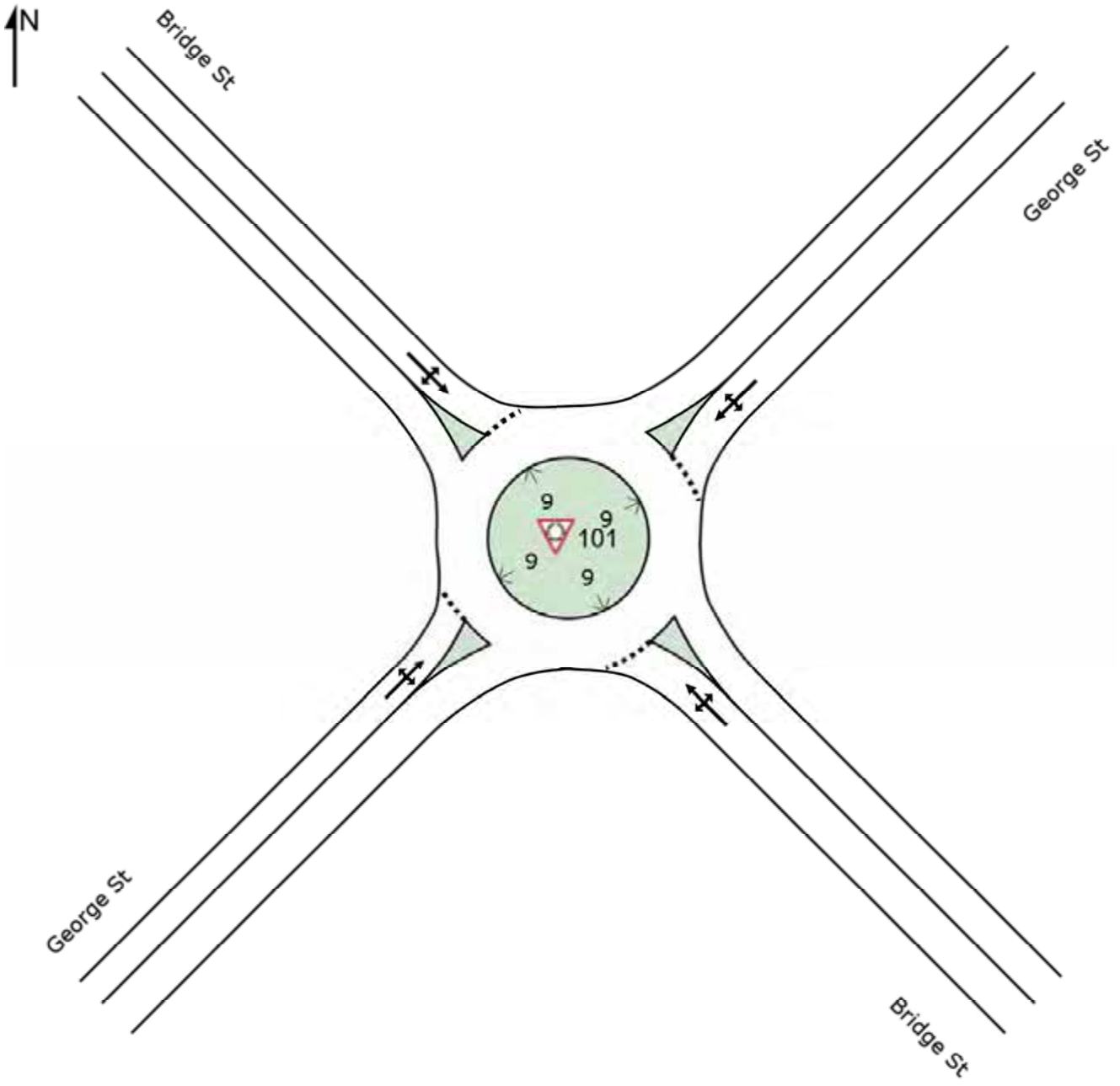
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	NorthWest Full Crossing	21	43.3	LOS E	0.1	0.1	0.93	0.93
P4	SouthWest Full Crossing	21	18.0	LOS B	0.0	0.0	0.60	0.60
All Pedestrians		42	30.6	LOS D			0.77	0.77

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 101 [2018PM BC Bridge St/George St 15-16pm]

New Site
Site Category: (None)
Roundabout



MOVEMENT SUMMARY

Site: 101 [2018PM BC Bridge St/George St 15-16pm]

Network: N101 [Windsor-2018PM BC 15-16pm]

New Site
Site Category: (None)
Roundabout

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bridge St														
1	L2	47	6.7	43	6.8	0.927	12.0	LOS A	19.2	144.9	0.72	0.77	0.93	38.8
2	T1	953	8.8	856	9.0	0.927	12.1	LOS A	19.2	144.9	0.72	0.77	0.93	40.0
3	R2	15	7.1	13	7.3	0.927	15.2	LOS B	19.2	144.9	0.72	0.77	0.93	39.5
Approach		1015	8.7	911[N1]	8.9	0.927	12.2	LOS A	19.2	144.9	0.72	0.77	0.93	39.9
NorthEast: George St														
4	L2	27	7.7	27	7.7	0.131	7.6	LOS A	0.5	4.0	0.64	0.75	0.64	40.9
5	T1	24	8.7	24	8.7	0.131	7.4	LOS A	0.5	4.0	0.64	0.75	0.64	45.0
6	R2	24	8.7	24	8.7	0.131	10.5	LOS A	0.5	4.0	0.64	0.75	0.64	45.7
Approach		76	8.3	76	8.3	0.131	8.4	LOS A	0.5	4.0	0.64	0.75	0.64	44.2
NorthWest: Bridge St														
7	L2	51	2.1	51	2.1	0.802	5.3	LOS A	5.1	38.9	0.41	0.52	0.41	47.2
8	T1	523	8.9	523	8.9	0.802	5.5	LOS A	5.1	38.9	0.41	0.52	0.41	45.6
9	R2	103	28.6	103	28.6	0.802	9.0	LOS A	5.1	38.9	0.41	0.52	0.41	47.4
Approach		677	11.4	677	11.4	0.802	6.0	LOS A	5.1	38.9	0.41	0.52	0.41	46.3
SouthWest: George St														
10	L2	172	10.4	172	10.4	0.597	23.8	LOS B	6.3	47.3	1.00	1.12	1.36	36.7
11	T1	16	6.7	16	6.7	0.597	23.5	LOS B	6.3	47.3	1.00	1.12	1.36	37.6
12	R2	47	6.7	47	6.7	0.597	26.6	LOS B	6.3	47.3	1.00	1.12	1.36	30.2
Approach		235	9.4	235	9.4	0.597	24.3	LOS B	6.3	47.3	1.00	1.12	1.36	35.8
All Vehicles		2002	9.7	1899[N1]	10.2	0.927	11.3	LOS A	19.2	144.9	0.64	0.72	0.79	41.1

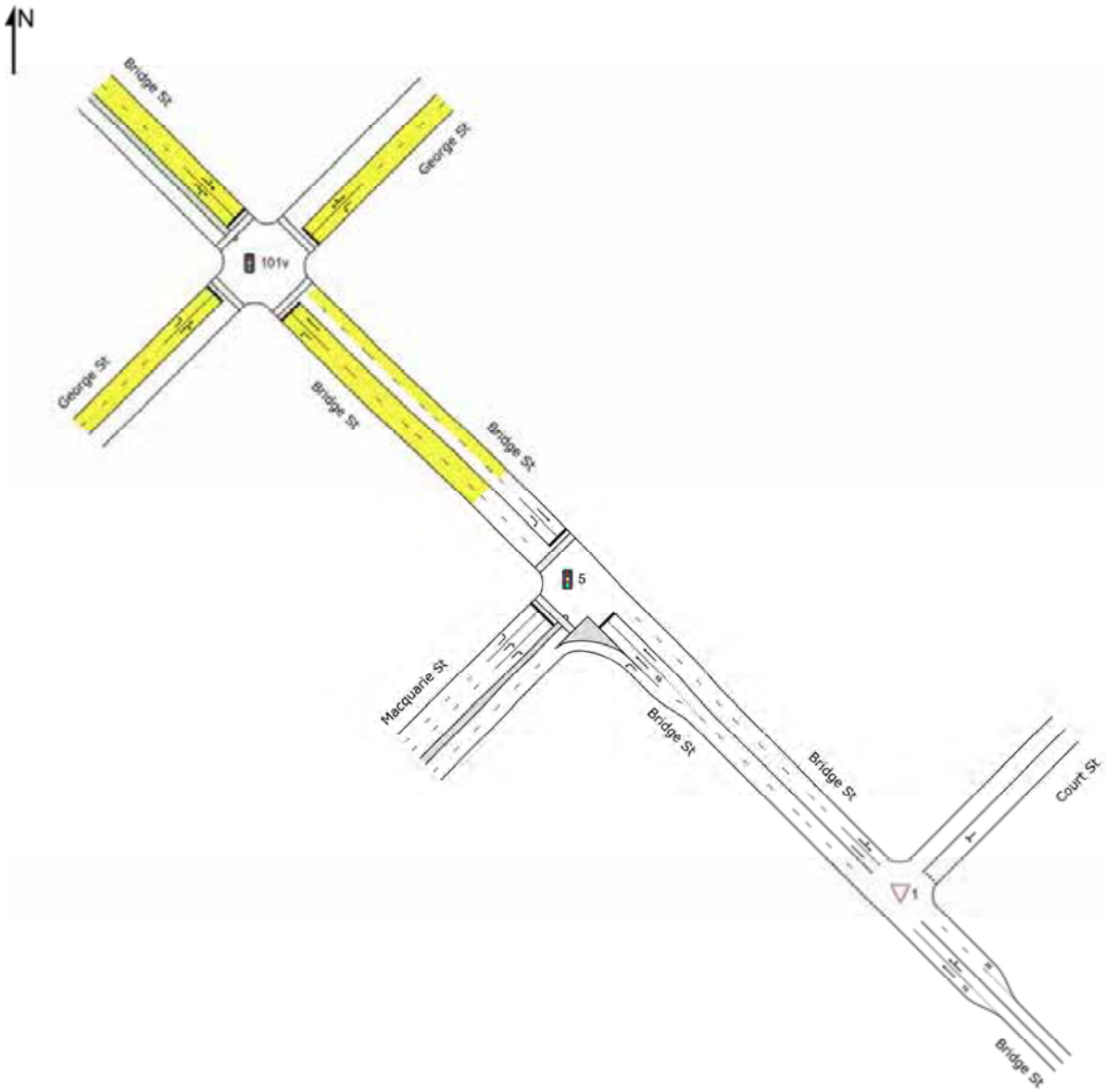
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity 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.

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

NETWORK LAYOUT

Network: N101 [Windsor-2027PM BC 15-16pm]

New Network
Network Category: (None)

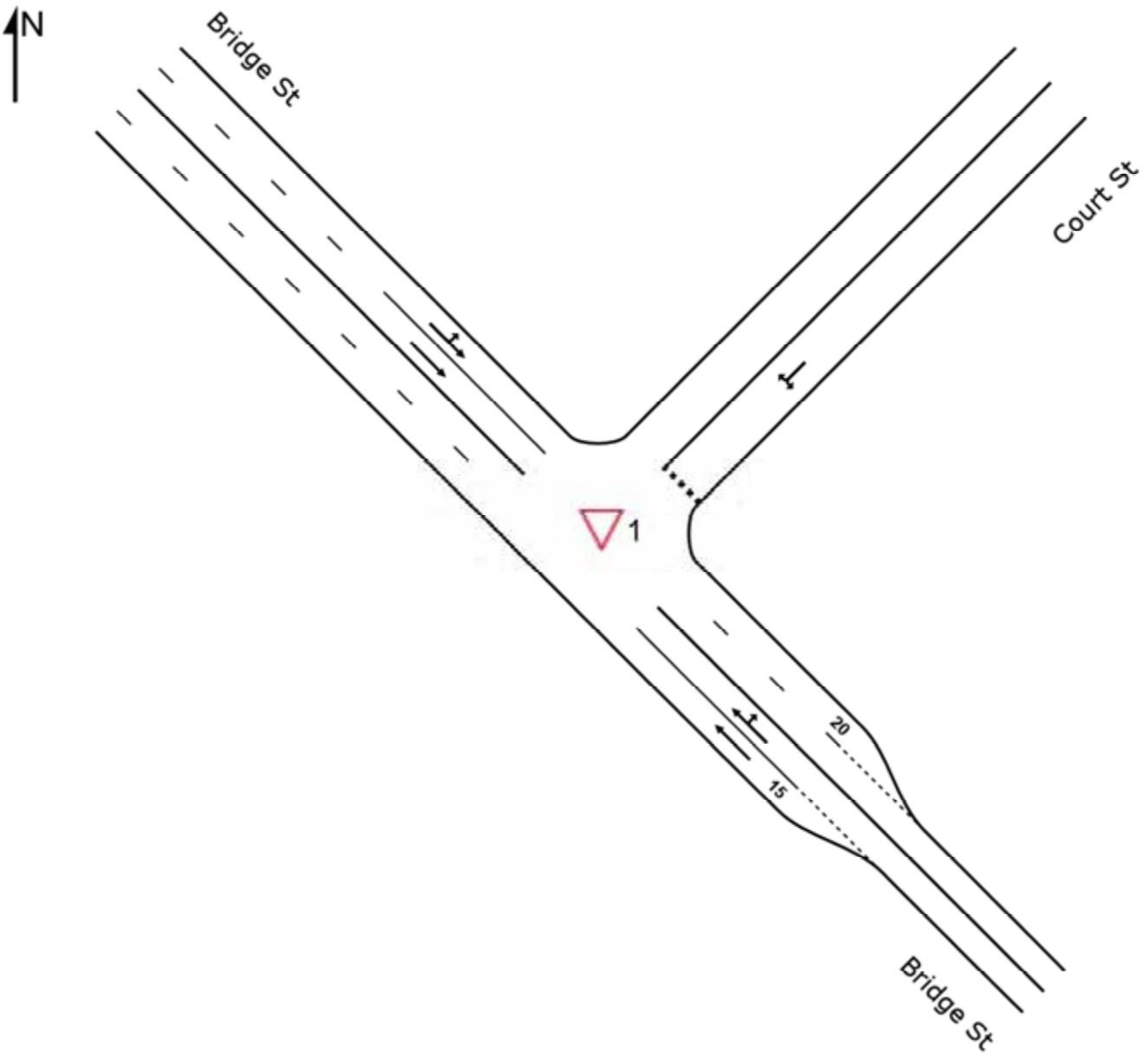


SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽1	NA	2027PM BC Bridge St/Court St 15-16pm
5	NA	2027PM BC Macquarie St/Bridge St 15-16pm
101v	NA	2027PM BC Bridge St/George St 15-16pm

SITE LAYOUT

Site: 1 [2027PM BC Bridge St/Court St 15-16pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:39:22 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Winsdor\Windsor Br_final 20190919.sip8

MOVEMENT SUMMARY

Site: 1 [2027PM BC Bridge St/Court St 15-16pm]

Network: N101 [Windsor-2027PM BC 15-16pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
2	T1	1434	3.0	1434	3.0	0.461	2.0	LOS A	45.3	325.5	0.12	0.20	0.18	55.7
3	R2	72	3.0	72	3.0	0.461	12.8	LOS A	45.3	325.5	0.28	0.21	0.41	50.9
Approach		1505	3.0	1505	3.0	0.461	2.5	NA	45.3	325.5	0.13	0.20	0.19	55.2
NorthEast: Court St														
4	L2	53	3.0	53	3.0	0.716	39.1	LOS C	2.9	20.6	0.48	0.85	1.05	28.7
6	R2	39	3.0	39	3.0	0.716	84.3	LOS F	2.9	20.6	0.48	0.85	1.05	19.4
Approach		92	3.0	92	3.0	0.716	58.3	LOS E	2.9	20.6	0.48	0.85	1.05	25.4
NorthWest: Bridge St														
7	L2	54	3.0	49	3.0	0.080	3.9	LOS A	0.0	0.0	0.00	0.19	0.00	47.5
8	T1	854	3.0	780	3.0	0.386	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		907	3.0	829[N1]	3.0	0.386	0.2	NA	0.0	0.0	0.00	0.03	0.00	49.6
All Vehicles		2504	3.0	2426[N1]	3.1	0.716	3.8	NA	45.3	325.5	0.10	0.17	0.16	50.1

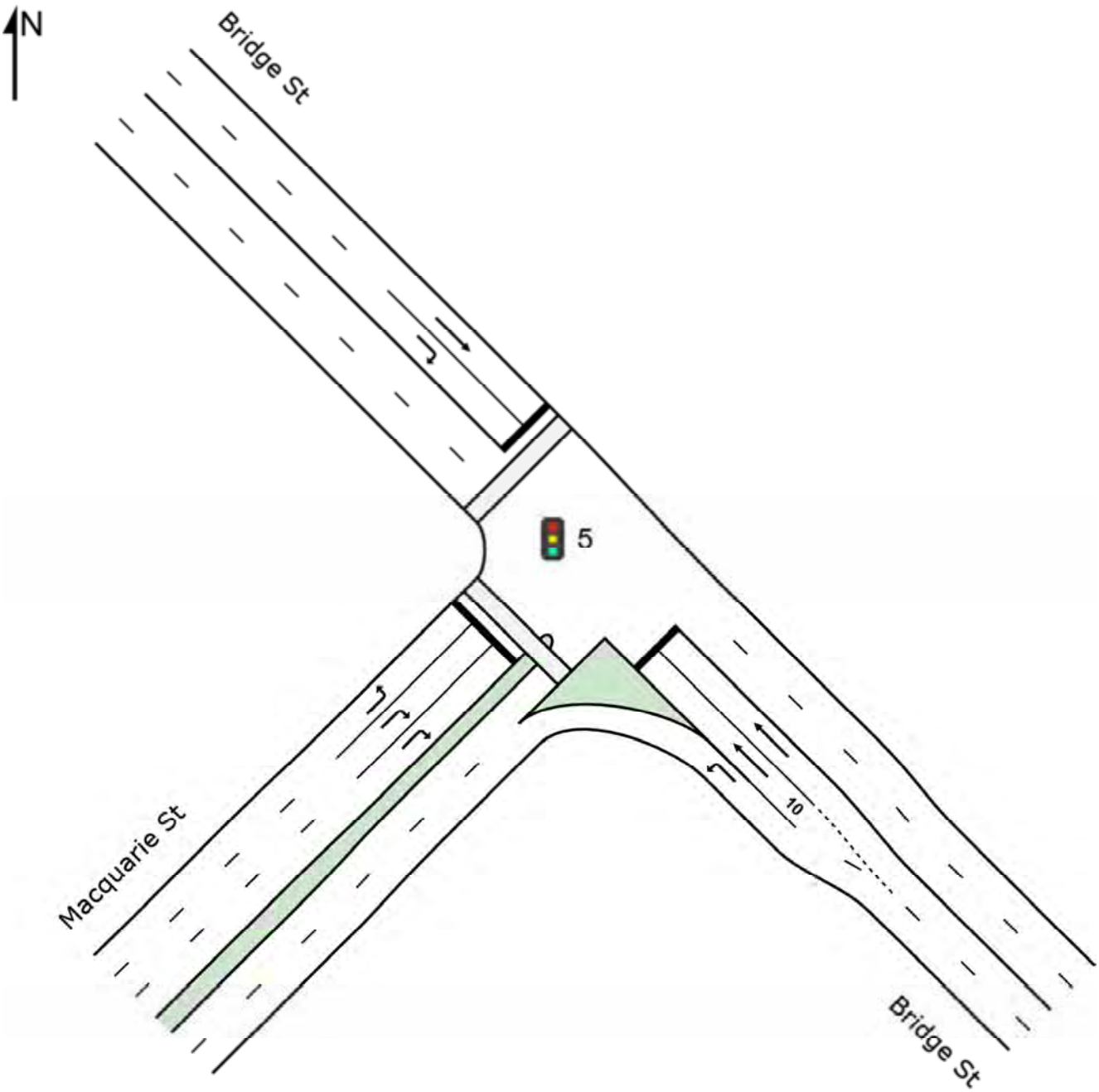
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
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.

SITE LAYOUT

Site: 5 [2027PM BC Macquarie St/Bridge St 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 5 [2027PM BC Macquarie St/Bridge St 15-16pm]

Network: N101 [Windsor-2027PM BC 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	422	3.0	422	3.0	0.249	3.8	LOS A	0.0	0.0	0.00	0.46	0.00	46.9
2	T1	1036	3.0	1036	3.0	1.141	192.4	LOS F	11.4	81.6	1.00	2.07	2.53	1.2
Approach		1458	3.0	1458	3.0	1.141	137.8	LOS F	11.4	81.6	0.71	1.61	1.80	5.0
NorthWest: Bridge St														
8	T1	344	3.0	344	3.0	0.260	0.4	LOS A	0.4	3.2	0.03	0.03	0.03	47.4
9	R2	357	3.0	357	3.0	1.092	136.2	LOS F	15.9	114.2	1.00	1.38	2.06	11.9
Approach		701	3.0	701	3.0	1.092	69.5	LOS E	15.9	114.2	0.52	0.71	1.06	13.2
SouthWest: Macquarie St														
10	L2	348	3.0	348	3.0	0.513	30.0	LOS C	12.9	92.3	0.81	0.81	0.81	30.5
12	R2	554	3.0	554	3.0	1.087	146.7	LOS F	25.9	186.1	1.00	1.33	2.18	10.3
Approach		902	3.0	902	3.0	1.087	101.6	LOS F	25.9	186.1	0.93	1.13	1.65	13.8
All Vehicles		3061	3.0	3061	3.0	1.141	111.5	LOS F	25.9	186.1	0.73	1.26	1.59	8.9

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

Movement Performance - Pedestrians

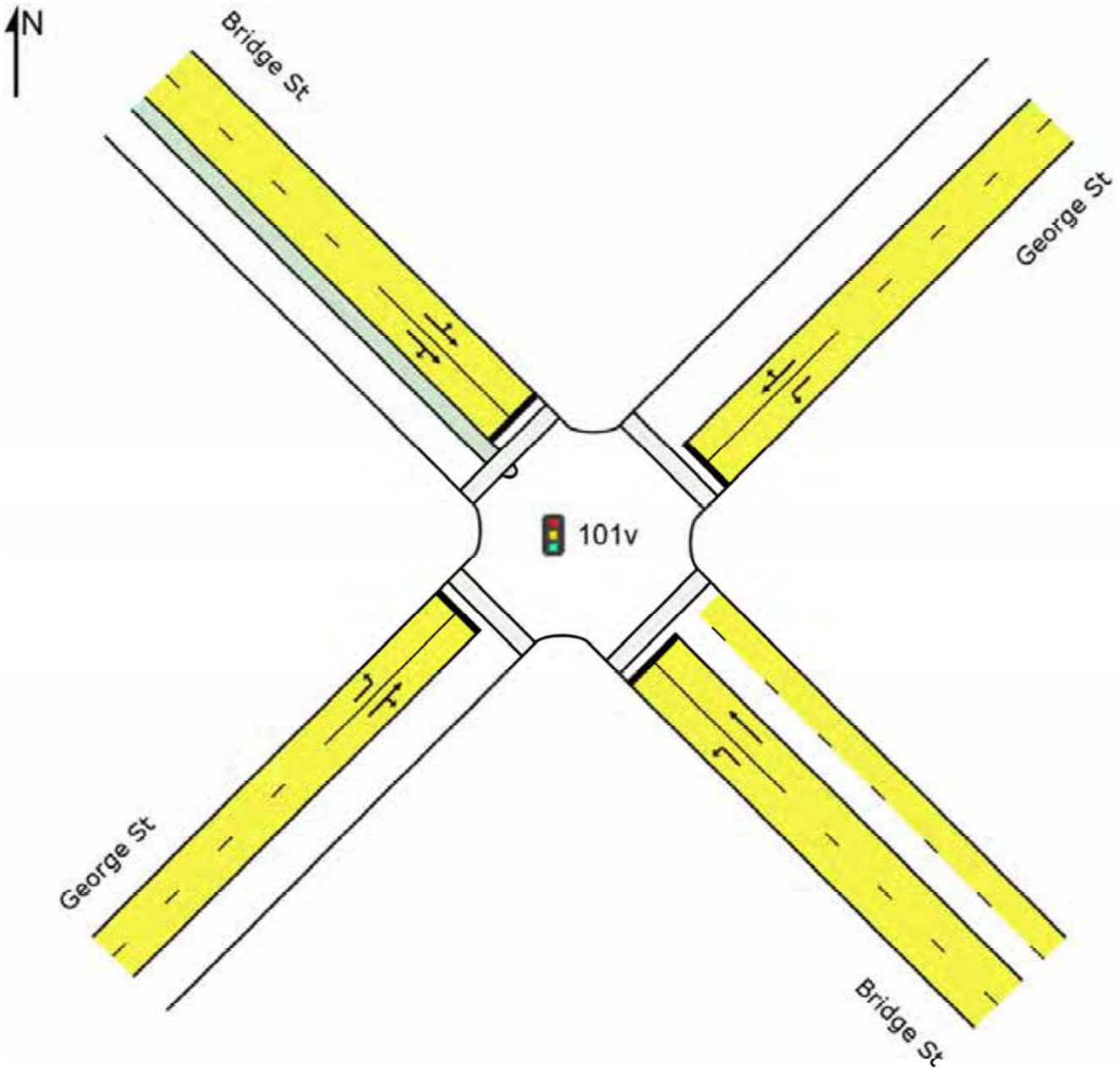
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	21.1	LOS C	0.0	0.0	0.65	0.65
All Pedestrians		42	32.7	LOS D			0.80	0.80

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 101v [2027PM BC Bridge St/George St 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 101v [2027PM BC Bridge St/George St 15-16pm]

Network: N101 [Windsor-2027PM BC 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bridge St														
1	L2	22	3.0	20	3.0	0.014	4.8	LOS A	0.0	0.1	0.02	0.53	0.02	44.2
2	T1	1363	3.0	1245	3.0	0.820	0.6	LOS A	6.1	43.6	0.11	0.11	0.11	49.1
Approach		1385	3.0	1265 N1	3.0	0.820	0.6	LOS A	6.1	43.6	0.11	0.11	0.11	49.0
NorthEast: George St														
4	L2	1	3.0	1	3.0	0.012	55.3	LOS D	0.1	0.4	0.97	0.59	0.97	20.1
5	T1	1	3.0	1	3.0	0.023	49.9	LOS D	0.1	0.7	0.96	0.60	0.96	29.2
6	R2	1	3.0	1	3.0	0.023	54.5	LOS D	0.1	0.7	0.96	0.60	0.96	27.1
Approach		3	3.0	3	3.0	0.023	53.2	LOS D	0.1	0.7	0.96	0.60	0.96	26.0
NorthWest: Bridge St														
7	L2	1	3.0	1	3.0	0.445	7.3	LOS A	9.2	66.0	0.31	0.28	0.31	47.3
8	T1	699	3.0	699	3.0	0.445	2.8	LOS A	9.2	66.0	0.31	0.29	0.31	45.1
9	R2	63	3.0	63	3.0	0.445	9.2	LOS A	1.6	11.2	0.37	0.57	0.37	43.8
Approach		763	3.0	763	3.0	0.445	3.3	LOS A	9.2	66.0	0.31	0.31	0.31	44.9
SouthWest: George St														
10	L2	9	3.0	9	3.0	0.112	57.0	LOS E	0.5	3.4	0.98	0.67	0.98	25.9
11	T1	1	3.0	1	3.0	0.437	55.8	LOS D	1.2	8.9	1.00	0.73	1.00	27.4
12	R2	22	3.0	22	3.0	0.437	60.4	LOS E	1.2	8.9	1.00	0.73	1.00	19.1
Approach		33	3.0	33	3.0	0.437	59.2	LOS E	1.2	8.9	0.99	0.71	1.00	21.7
All Vehicles		2184	3.0	2064 N1	3.2	0.820	2.6	LOS A	9.2	66.0	0.20	0.20	0.20	46.0

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

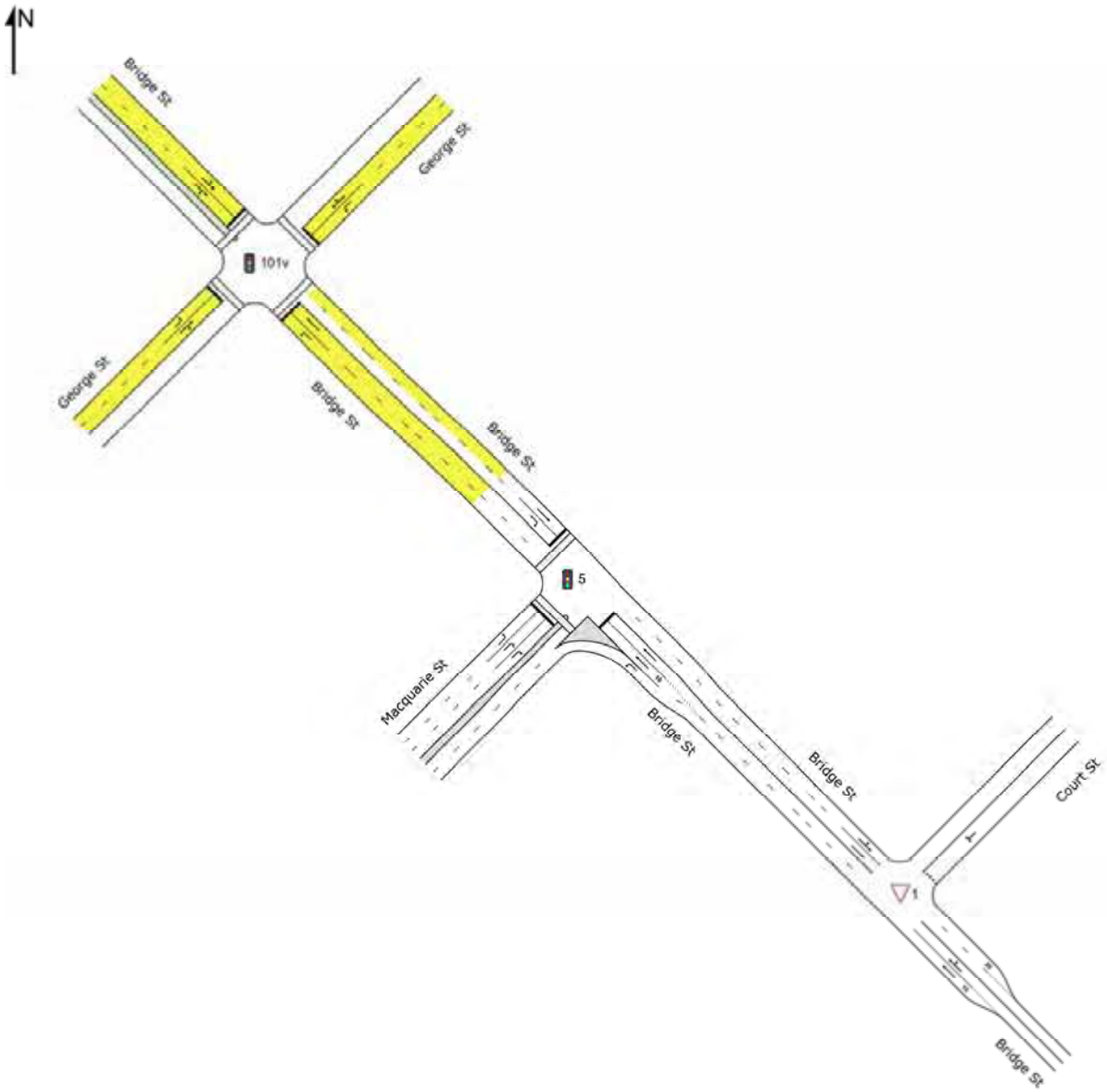
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	3.9	LOS A	0.0	0.0	0.28	0.28
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	3.4	LOS A	0.0	0.0	0.26	0.26
All Pedestrians		84	23.9	LOS C			0.61	0.61

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [Windsor-2027PM S1 15-16pm]

New Network
Network Category: (None)

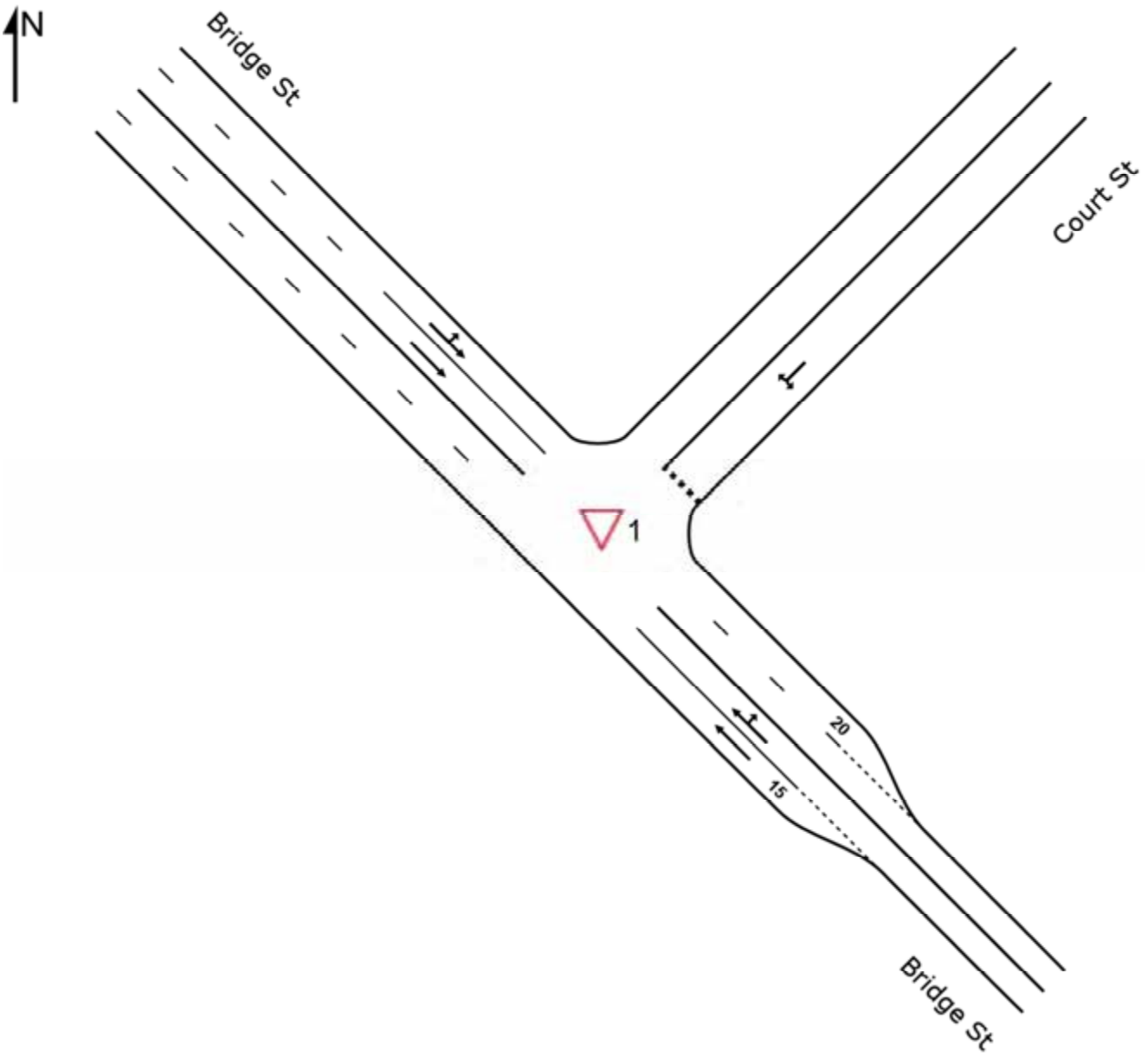


SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽1	NA	2027PM S1 Bridge St/Court St 15-16pm
5	NA	2027PM S1 Macquarie St/Bridge St 15-16pm
101v	NA	2027PM S1 Bridge St/George St 15-16pm

SITE LAYOUT

Site: 1 [2027PM S1 Bridge St/Court St 15-16pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:41:05 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Winsdor\Windsor Br_final 20190919.sip8

MOVEMENT SUMMARY

Site: 1 [2027PM S1 Bridge St/Court St 15-16pm]

Network: N101 [Windsor-2027PM S1 15-16pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
2	T1	1434	3.0	1434	3.0	0.460	1.9	LOS A	47.9	344.1	0.12	0.20	0.17	55.8
3	R2	74	3.0	74	3.0	0.460	12.4	LOS A	47.9	344.1	0.28	0.21	0.41	51.0
Approach		1507	3.0	1507	3.0	0.460	2.4	NA	47.9	344.1	0.13	0.20	0.19	55.3
NorthEast: Court St														
4	L2	66	3.0	66	3.0	0.658	29.3	LOS C	2.8	20.3	0.42	0.78	0.87	32.0
6	R2	38	3.0	38	3.0	0.658	73.3	LOS F	2.8	20.3	0.42	0.78	0.87	22.5
Approach		104	3.0	104	3.0	0.658	45.3	LOS D	2.8	20.3	0.42	0.78	0.87	29.2
NorthWest: Bridge St														
7	L2	54	3.0	50	3.0	0.076	3.9	LOS A	0.0	0.0	0.00	0.20	0.00	47.4
8	T1	800	3.0	743	3.0	0.369	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		854	3.0	793[N1]	3.0	0.369	0.2	NA	0.0	0.0	0.00	0.03	0.00	49.6
All Vehicles		2465	3.0	2405[N1]	3.1	0.658	3.6	NA	47.9	344.1	0.10	0.17	0.15	50.5

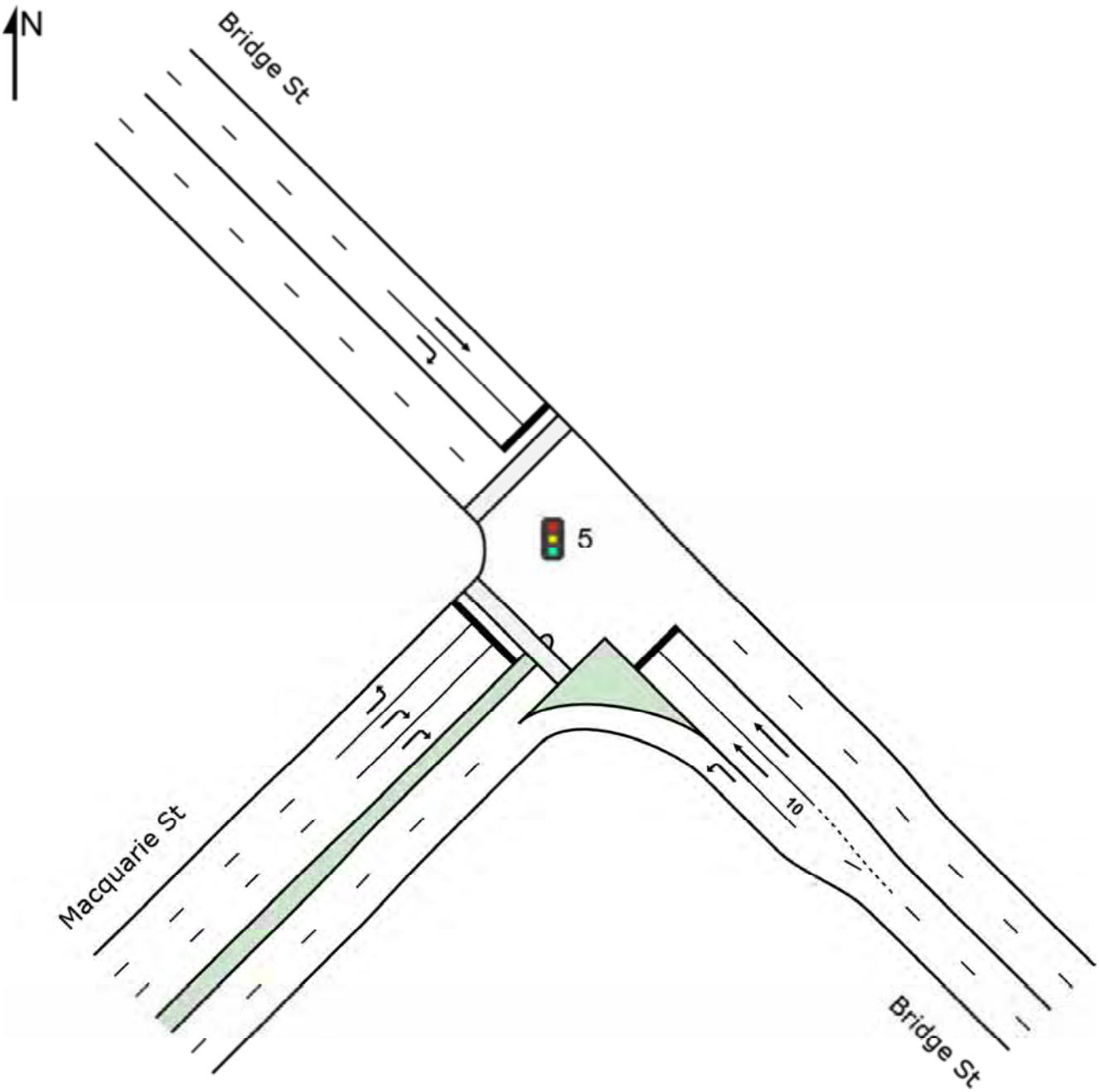
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
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.

SITE LAYOUT

Site: 5 [2027PM S1 Macquarie St/Bridge St 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 5 [2027PM S1 Macquarie St/Bridge St 15-16pm]

Network: N101 [Windsor-2027PM S1 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	388	3.0	388	3.0	0.229	3.8	LOS A	0.0	0.0	0.00	0.46	0.00	46.9
2	T1	1078	3.0	1078	3.0	1.121	176.3	LOS F	11.4	81.6	1.00	2.00	2.41	1.3
Approach		1466	3.0	1466	3.0	1.121	130.6	LOS F	11.4	81.6	0.74	1.59	1.77	5.0
NorthWest: Bridge St														
8	T1	354	3.0	354	3.0	0.263	0.3	LOS A	0.5	3.3	0.03	0.03	0.03	47.5
9	R2	321	3.0	321	3.0	1.098	142.2	LOS F	15.9	114.2	1.00	1.39	2.11	11.5
Approach		675	3.0	675	3.0	1.098	67.8	LOS E	15.9	114.2	0.49	0.68	1.02	12.9
SouthWest: Macquarie St														
10	L2	377	3.0	377	3.0	0.600	33.2	LOS C	15.0	107.5	0.87	0.83	0.87	29.0
12	R2	539	3.0	539	3.0	1.134	183.5	LOS F	28.8	206.8	1.00	1.44	2.45	8.5
Approach		916	3.0	916	3.0	1.134	121.6	LOS F	28.8	206.8	0.94	1.19	1.80	11.9
All Vehicles		3057	3.0	3057	3.0	1.134	114.0	LOS F	28.8	206.8	0.74	1.27	1.61	8.5

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

Movement Performance - Pedestrians

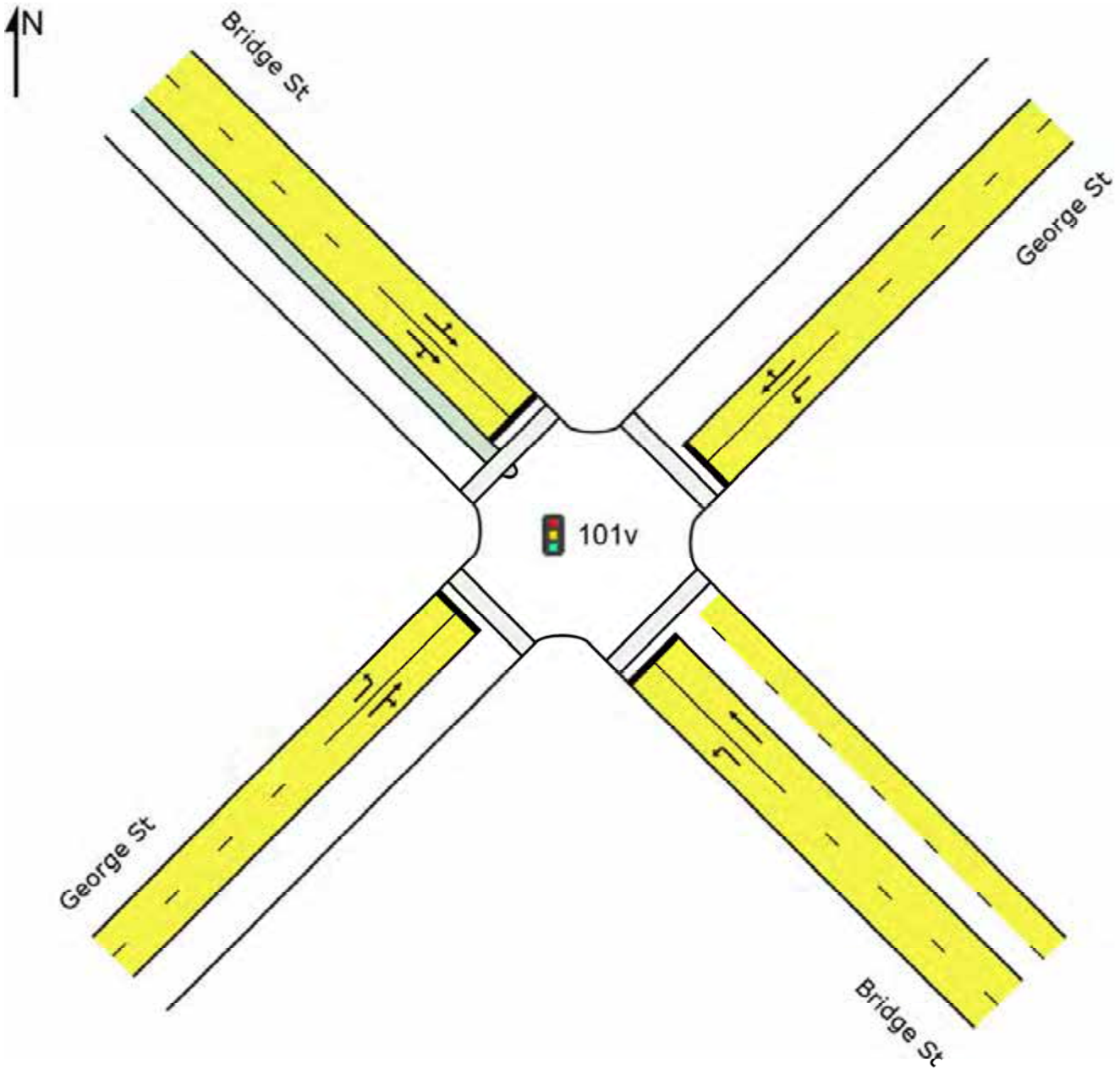
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	19.2	LOS B	0.0	0.0	0.62	0.62
All Pedestrians		42	31.7	LOS D			0.78	0.78

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 101v [2027PM S1 Bridge St/George St 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 101v [2027PM S1 Bridge St/George St 15-16pm]

Network: N101 [Windsor-2027PM S1 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bridge St														
1	L2	24	3.0	22	3.0	0.016	4.8	LOS A	0.0	0.2	0.02	0.53	0.02	44.2
2	T1	1423	3.0	1302	3.0	0.857	1.3	LOS A	8.6	61.7	0.14	0.14	0.14	48.0
Approach		1447	3.0	1325 N1	3.0	0.857	1.3	LOS A	8.6	61.7	0.14	0.14	0.14	48.0
NorthEast: George St														
4	L2	1	3.0	1	3.0	0.012	55.3	LOS D	0.1	0.4	0.97	0.59	0.97	20.1
5	T1	1	3.0	1	3.0	0.023	49.9	LOS D	0.1	0.7	0.96	0.60	0.96	29.2
6	R2	1	3.0	1	3.0	0.023	54.5	LOS D	0.1	0.7	0.96	0.60	0.96	27.1
Approach		3	3.0	3	3.0	0.023	53.3	LOS D	0.1	0.7	0.96	0.60	0.96	26.0
NorthWest: Bridge St														
7	L2	1	3.0	1	3.0	0.445	7.3	LOS A	9.2	65.9	0.31	0.28	0.31	47.3
8	T1	678	3.0	678	3.0	0.445	2.7	LOS A	9.2	65.9	0.31	0.28	0.31	45.3
9	R2	72	3.0	72	3.0	0.445	10.1	LOS A	1.5	10.5	0.40	0.66	0.40	42.6
Approach		751	3.0	751	3.0	0.445	3.4	LOS A	9.2	65.9	0.32	0.32	0.32	44.8
SouthWest: George St														
10	L2	12	3.0	12	3.0	0.136	57.2	LOS E	0.6	4.2	0.98	0.68	0.98	25.9
11	T1	1	3.0	1	3.0	0.256	54.6	LOS D	0.7	5.2	0.98	0.70	0.98	27.7
12	R2	13	3.0	13	3.0	0.256	59.2	LOS E	0.7	5.2	0.98	0.70	0.98	19.4
Approach		25	3.0	25	3.0	0.256	58.1	LOS E	0.7	5.2	0.98	0.69	0.98	23.1
All Vehicles		2226	3.0	2104 N1	3.2	0.857	2.8	LOS A	9.2	65.9	0.21	0.21	0.21	45.8

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

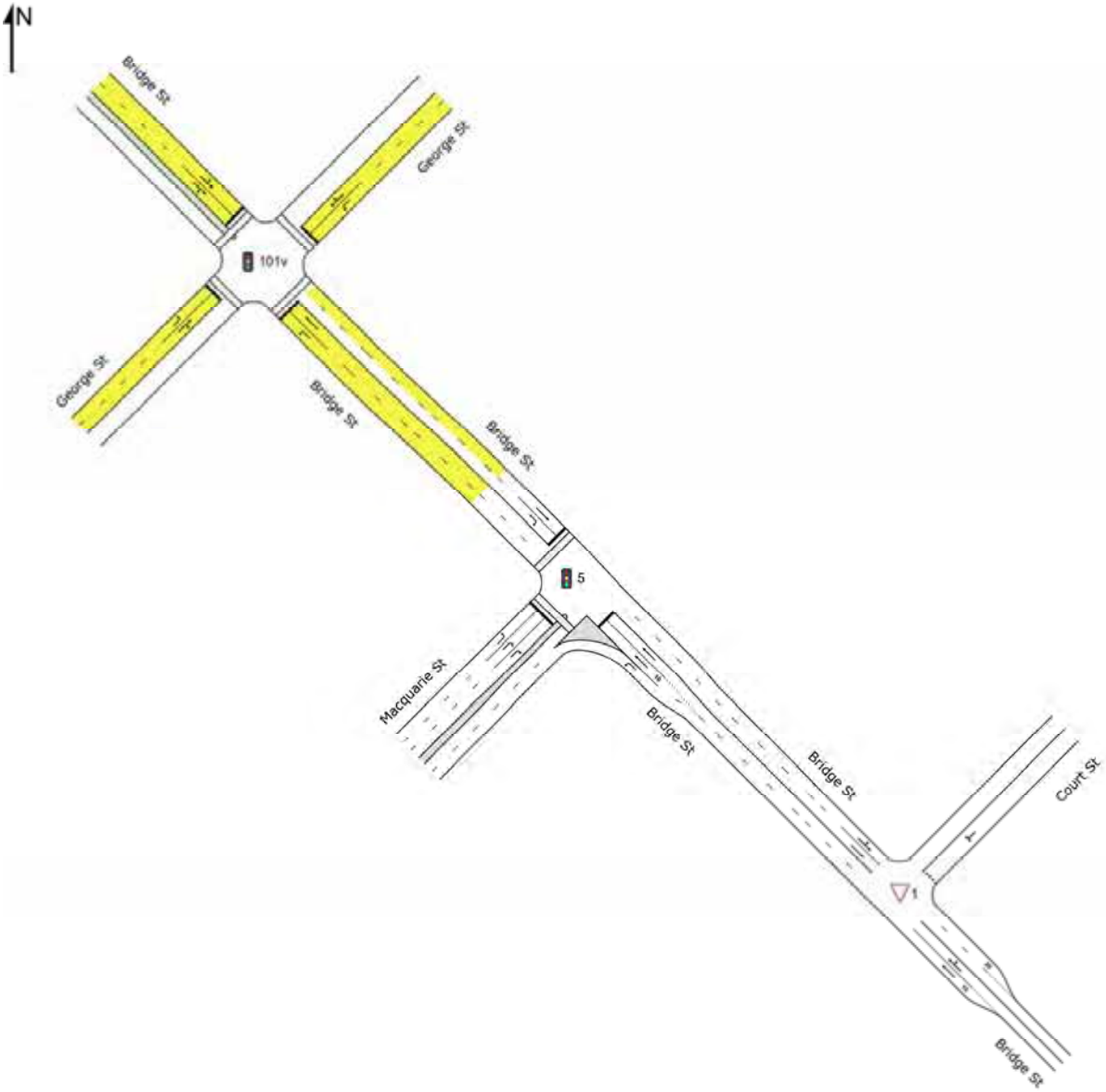
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	3.9	LOS A	0.0	0.0	0.28	0.28
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	3.4	LOS A	0.0	0.0	0.26	0.26
All Pedestrians		84	23.9	LOS C			0.61	0.61

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [Windsor-2027PM S2 15-16pm]

New Network
Network Category: (None)

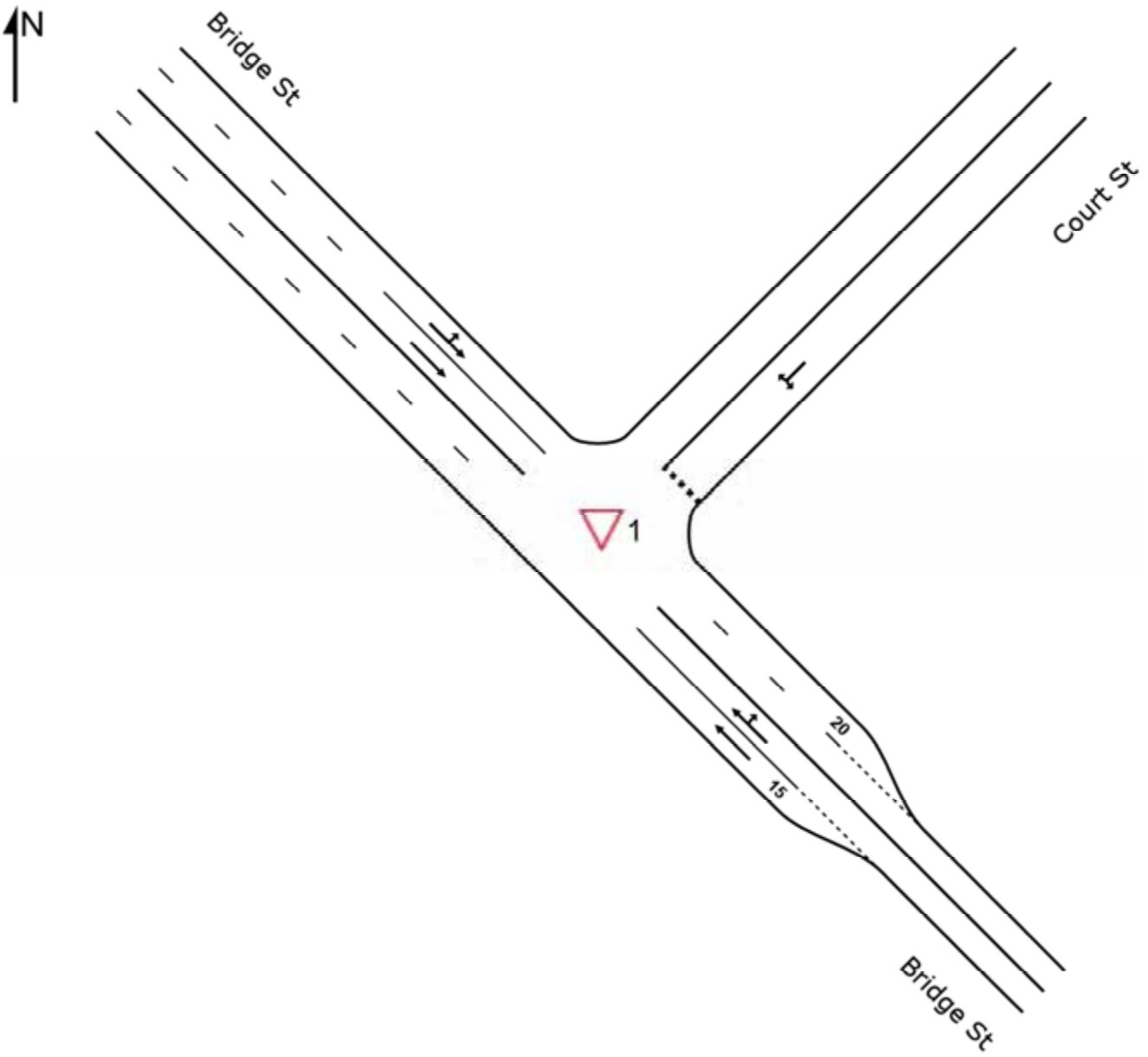


SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽1	NA	2027PM S2 Bridge St/Court St 15-16pm
5	NA	2027PM S2 Macquarie St/Bridge St 15-16pm
101v	NA	2027PM S2 Bridge St/George St 15-16pm

SITE LAYOUT

Site: 1 [2027PM S2 Bridge St/Court St 15-16pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:44:36 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Winsdor\Windsor Br_final 20190919.sip8

MOVEMENT SUMMARY

Site: 1 [2027PM S2 Bridge St/Court St 15-16pm]

Network: N101 [Windsor-2027PM S2 15-16pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
2	T1	1383	3.0	1383	3.0	0.446	2.0	LOS A	40.6	291.8	0.12	0.20	0.17	55.7
3	R2	69	3.0	69	3.0	0.446	12.8	LOS A	40.6	291.8	0.28	0.21	0.41	50.8
Approach		1453	3.0	1453	3.0	0.446	2.5	NA	40.6	291.8	0.13	0.20	0.19	55.2
NorthEast: Court St														
4	L2	63	3.0	63	3.0	0.767	45.0	LOS D	3.6	26.2	0.50	0.93	1.26	27.7
6	R2	43	3.0	43	3.0	0.767	89.5	LOS F	3.6	26.2	0.50	0.93	1.26	18.5
Approach		106	3.0	106	3.0	0.767	63.0	LOS E	3.6	26.2	0.50	0.93	1.26	24.6
NorthWest: Bridge St														
7	L2	43	3.0	41	3.0	0.082	3.9	LOS A	0.0	0.0	0.00	0.15	0.00	47.8
8	T1	854	3.0	812	3.0	0.396	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		897	3.0	853 N1	3.0	0.396	0.2	NA	0.0	0.0	0.00	0.03	0.00	49.7
All Vehicles		2456	3.0	2412 N1	3.1	0.767	4.3	NA	40.6	291.8	0.10	0.17	0.17	49.3

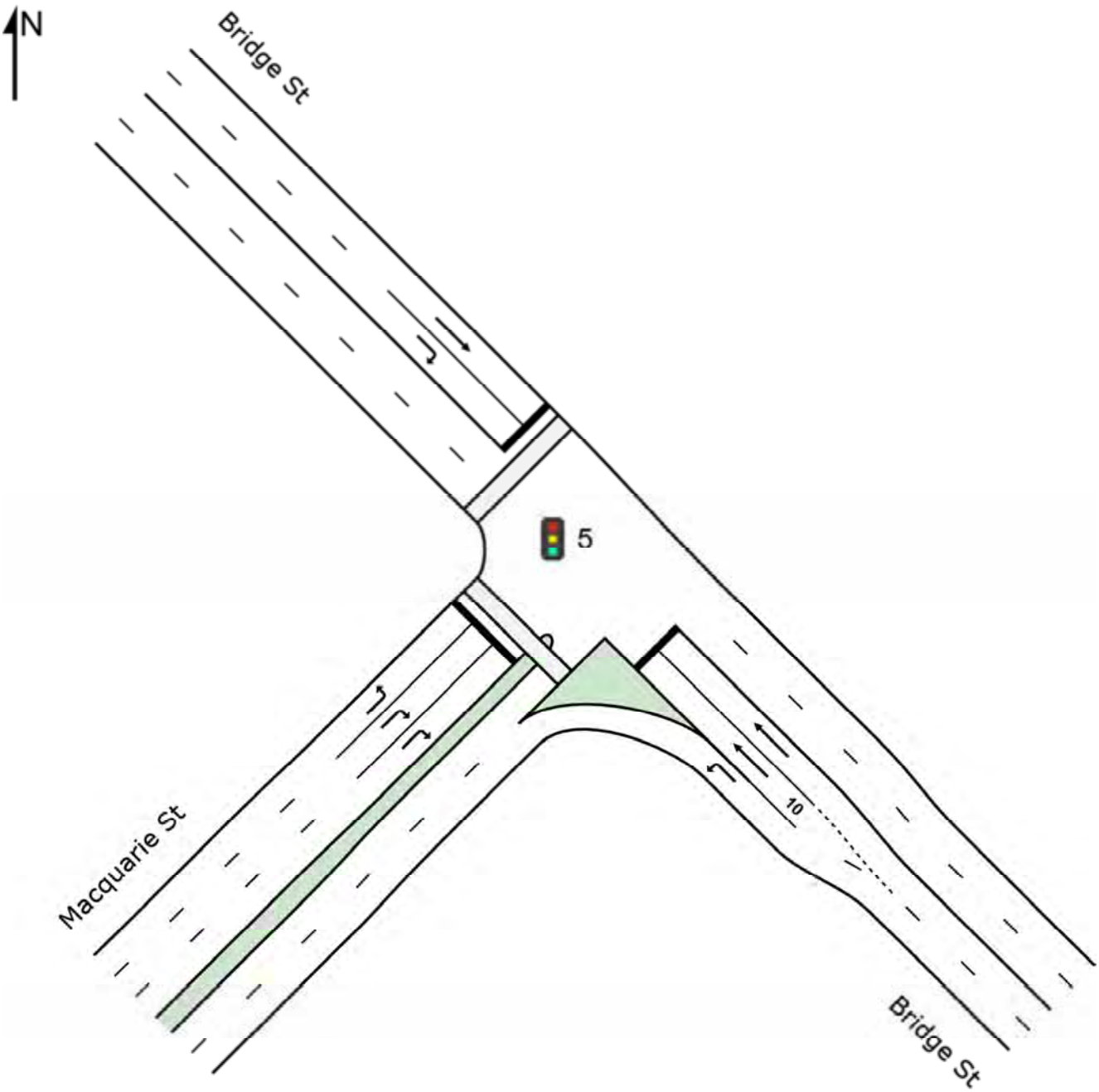
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
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.

SITE LAYOUT

Site: 5 [2027PM S2 Macquarie St/Bridge St 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 5 [2027PM S2 Macquarie St/Bridge St 15-16pm]

Network: N101 [Windsor-2027PM S2 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	415	3.0	415	3.0	0.244	3.8	LOS A	0.0	0.0	0.00	0.46	0.00	46.9
2	T1	1000	3.0	1000	3.0	1.102	161.6	LOS F	11.4	81.6	1.00	1.90	2.31	1.5
Approach		1415	3.0	1415	3.0	1.102	115.3	LOS F	11.4	81.6	0.71	1.48	1.63	5.9
NorthWest: Bridge St														
8	T1	366	3.0	366	3.0	0.277	0.4	LOS A	0.5	3.5	0.03	0.03	0.03	47.3
9	R2	349	3.0	349	3.0	1.069	118.7	LOS F	15.9	114.2	1.00	1.31	1.92	13.3
Approach		716	3.0	716	3.0	1.069	58.1	LOS E	15.9	114.2	0.50	0.65	0.95	14.7
SouthWest: Macquarie St														
10	L2	396	3.0	396	3.0	0.583	30.9	LOS C	15.2	108.8	0.84	0.83	0.84	30.0
12	R2	555	3.0	555	3.0	1.089	148.2	LOS F	26.1	187.7	1.00	1.34	2.19	10.2
Approach		951	3.0	951	3.0	1.089	99.4	LOS F	26.1	187.7	0.93	1.12	1.63	14.0
All Vehicles		3081	3.0	3081	3.0	1.102	97.1	LOS F	26.1	187.7	0.73	1.18	1.47	10.1

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

Movement Performance - Pedestrians

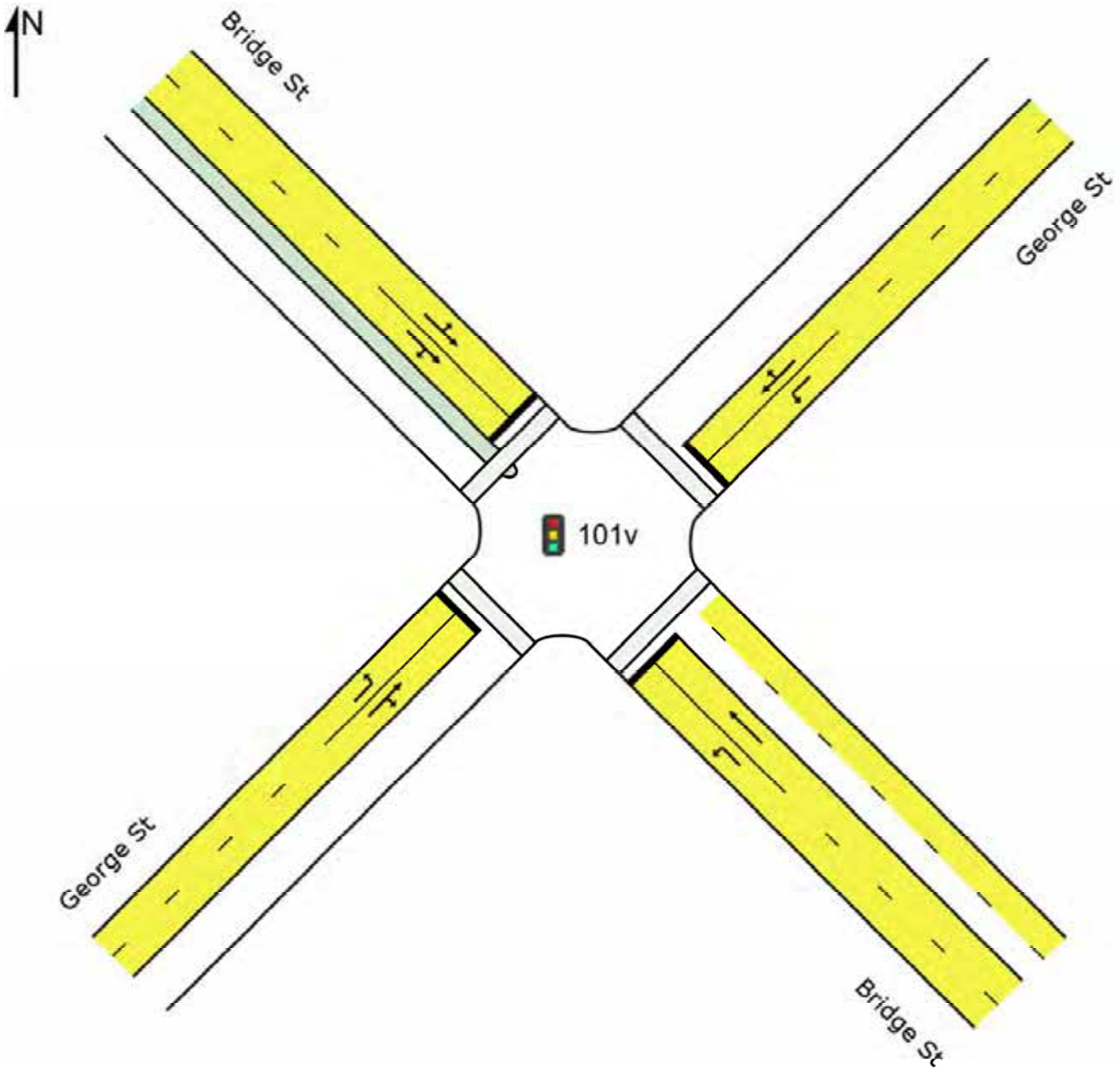
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	21.1	LOS C	0.0	0.0	0.65	0.65
All Pedestrians		42	32.7	LOS D			0.80	0.80

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 101v [2027PM S2 Bridge St/George St 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 101v [2027PM S2 Bridge St/George St 15-16pm]

Network: N101 [Windsor-2027PM S2 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bridge St														
1	L2	31	3.0	28	3.0	0.020	4.8	LOS A	0.0	0.2	0.02	0.53	0.02	44.2
2	T1	1360	3.0	1263	3.0	0.831	0.6	LOS A	6.5	47.0	0.12	0.11	0.12	49.1
Approach		1391	3.0	1291 N1	3.0	0.831	0.7	LOS A	6.5	47.0	0.12	0.12	0.12	48.9
NorthEast: George St														
4	L2	1	3.0	1	3.0	0.012	55.3	LOS D	0.1	0.4	0.97	0.59	0.97	20.1
5	T1	1	3.0	1	3.0	0.023	49.9	LOS D	0.1	0.7	0.96	0.60	0.96	29.2
6	R2	1	3.0	1	3.0	0.023	54.5	LOS D	0.1	0.7	0.96	0.60	0.96	27.1
Approach		3	3.0	3	3.0	0.023	53.3	LOS D	0.1	0.7	0.96	0.60	0.96	26.0
NorthWest: Bridge St														
7	L2	3	3.0	3	3.0	0.460	7.3	LOS A	9.7	69.6	0.31	0.29	0.31	47.3
8	T1	714	3.0	714	3.0	0.460	2.8	LOS A	9.7	69.6	0.32	0.30	0.32	45.0
9	R2	67	3.0	67	3.0	0.460	9.7	LOS A	1.6	11.6	0.39	0.61	0.39	43.3
Approach		784	3.0	784	3.0	0.460	3.4	LOS A	9.7	69.6	0.32	0.32	0.32	44.7
SouthWest: George St														
10	L2	12	3.0	12	3.0	0.136	57.2	LOS E	0.6	4.2	0.98	0.68	0.98	25.9
11	T1	1	3.0	1	3.0	0.397	55.5	LOS D	1.1	8.1	1.00	0.72	1.00	27.5
12	R2	20	3.0	20	3.0	0.397	60.1	LOS E	1.1	8.1	1.00	0.72	1.00	19.2
Approach		33	3.0	33	3.0	0.397	58.9	LOS E	1.1	8.1	0.99	0.71	0.99	22.2
All Vehicles		2211	3.0	2111 N1	3.1	0.831	2.7	LOS A	9.7	69.6	0.21	0.21	0.21	46.0

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

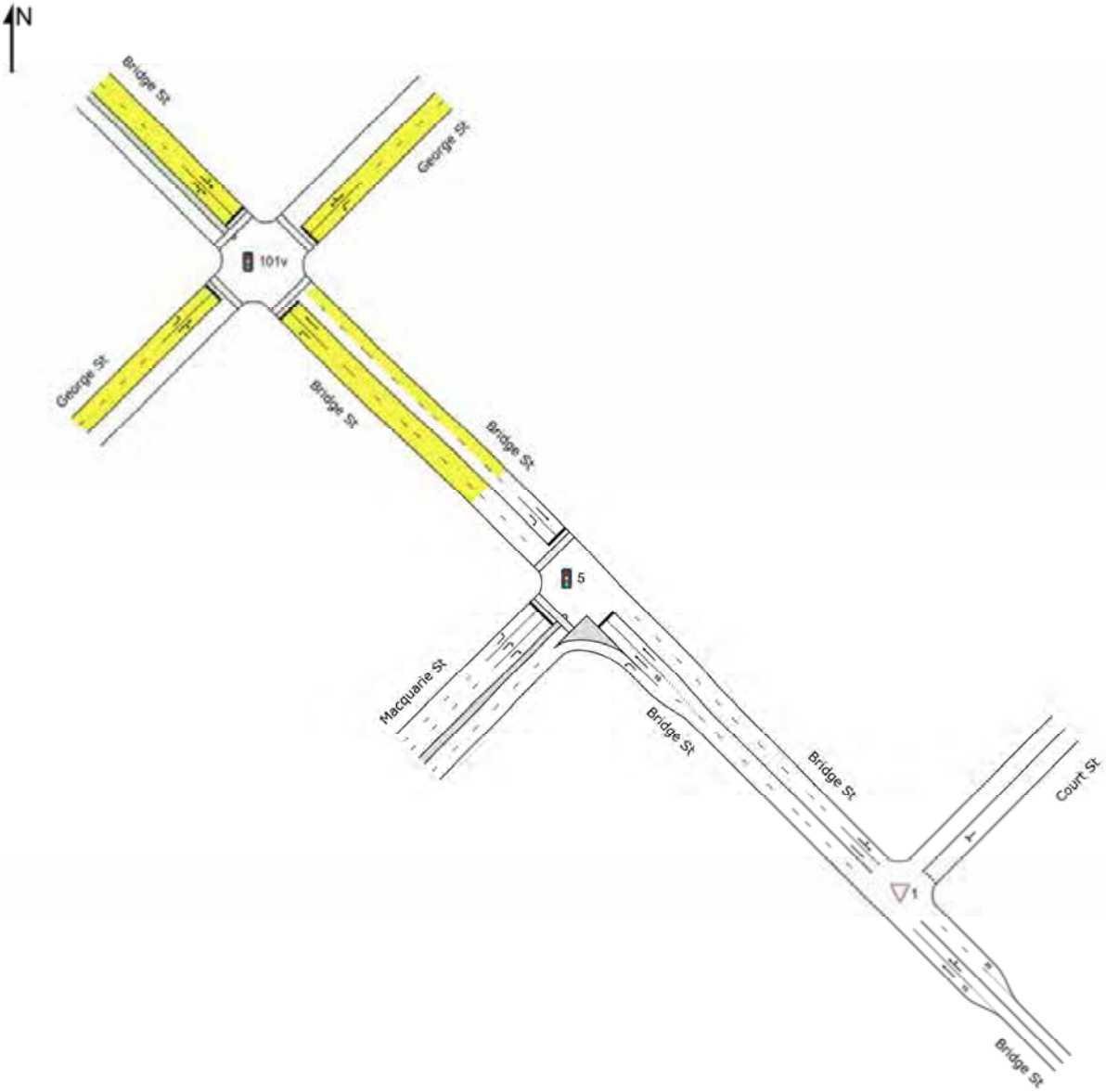
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	3.9	LOS A	0.0	0.0	0.28	0.28
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	3.4	LOS A	0.0	0.0	0.26	0.26
All Pedestrians		84	23.9	LOS C			0.61	0.61

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

NETWORK LAYOUT

Network: N101 [Windsor-2027PM S3 15-16pm]

New Network
Network Category: (None)

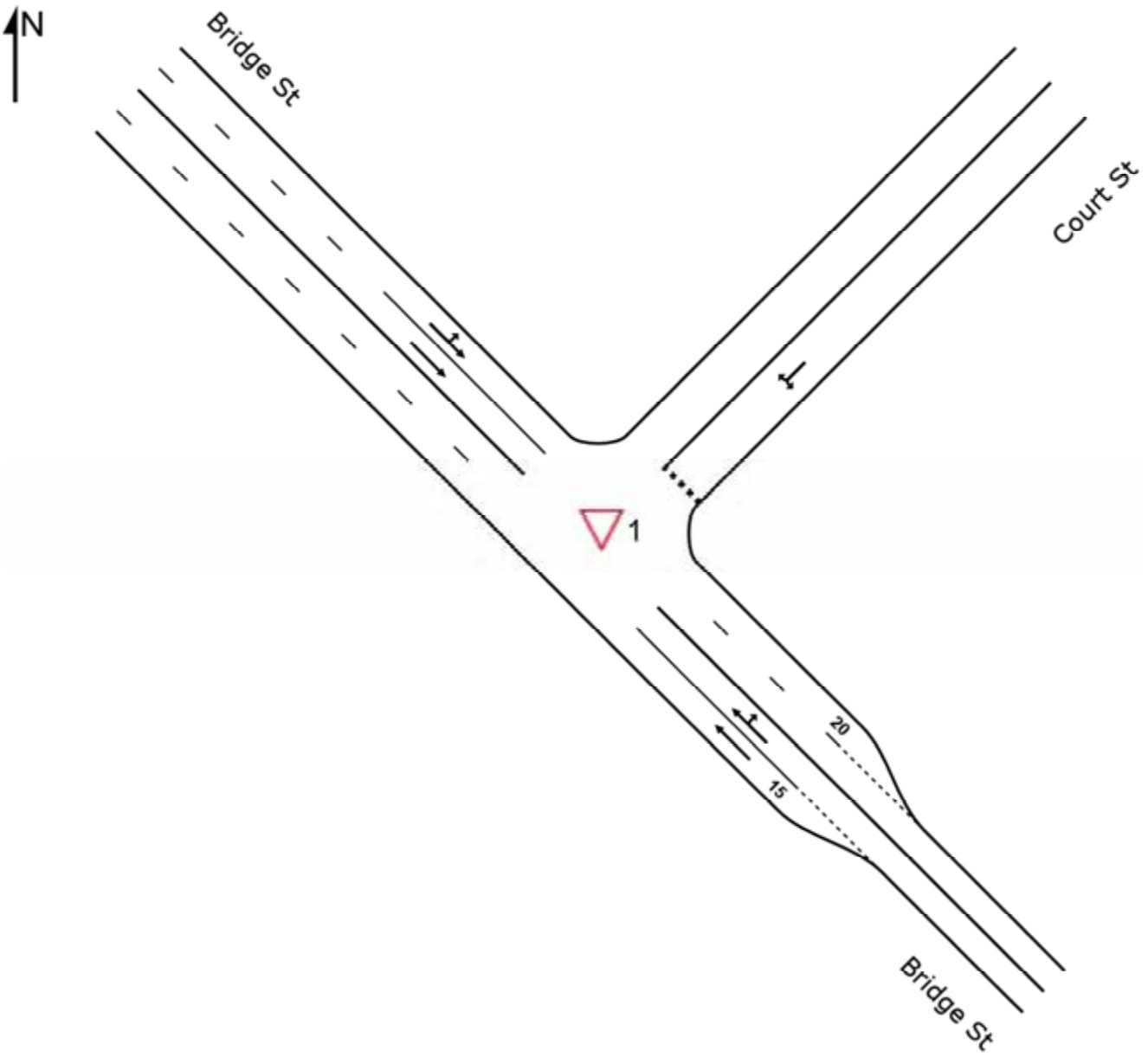


SITES IN NETWORK		
Site ID	**CCG ID**	**Site Name**
▽1	NA	2027PM S3 Bridge St/Court St 15-16pm
5	NA	2027PM S3 Macquarie St/Bridge St 15-16pm
101v	NA	2027PM S3 Bridge St/George St 15-16pm

SITE LAYOUT

Site: 1 [2027PM S3 Bridge St/Court St 15-16pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)



Organisation: SMEC AUSTRALIA | Created: Friday, 11 October 2019 12:46:15 PM
Project: \\ausyfsv001\projects$\30012099 - Hawkesbury City council Traffic Study\050 Working\005 SIDRA\Winsdor\Windsor Br_final 20190919.sip8

MOVEMENT SUMMARY

Site: 1 [2027PM S3 Bridge St/Court St 15-16pm]

Network: N101 [Windsor-2027PM S3 15-16pm]

New Site
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
2	T1	1369	3.0	1369	3.0	0.448	2.1	LOS A	41.0	294.7	0.13	0.20	0.19	55.5
3	R2	74	3.0	74	3.0	0.448	13.1	LOS A	41.0	294.7	0.31	0.21	0.45	50.6
Approach		1443	3.0	1443	3.0	0.448	2.6	NA	41.0	294.7	0.14	0.20	0.20	55.0
NorthEast: Court St														
4	L2	41	3.0	41	3.0	0.804	56.4	LOS D	3.2	23.0	0.52	0.94	1.30	24.7
6	R2	43	3.0	43	3.0	0.804	100.3	LOS F	3.2	23.0	0.52	0.94	1.30	16.0
Approach		84	3.0	84	3.0	0.804	78.9	LOS F	3.2	23.0	0.52	0.94	1.30	20.8
NorthWest: Bridge St														
7	L2	67	3.0	63	3.0	0.085	3.9	LOS A	0.0	0.0	0.00	0.23	0.00	47.2
8	T1	868	3.0	818	3.0	0.410	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.7
Approach		936	3.0	881 N1	3.0	0.410	0.3	NA	0.0	0.0	0.00	0.04	0.00	49.5
All Vehicles		2463	3.0	2409 N1	3.1	0.804	4.4	NA	41.0	294.7	0.10	0.17	0.17	49.1

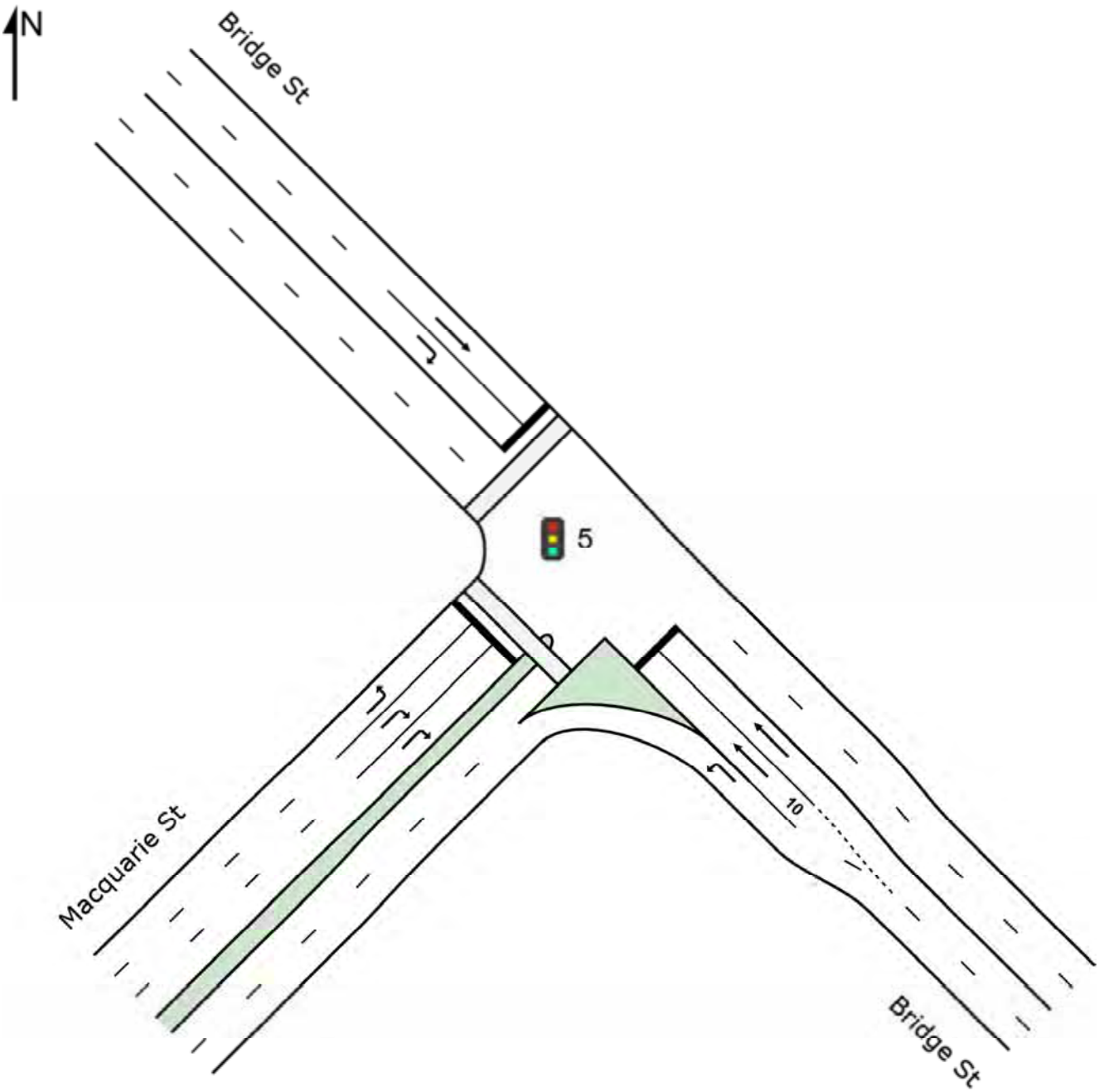
Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: Traditional M1.
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.

SITE LAYOUT

Site: 5 [2027PM S3 Macquarie St/Bridge St 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 5 [2027PM S3 Macquarie St/Bridge St 15-16pm]

Network: N101 [Windsor-2027PM S3 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m				km/h
SouthEast: Bridge St														
1	L2	416	3.0	416	3.0	0.245	3.8	LOS A	0.0	0.0	0.00	0.46	0.00	46.9
2	T1	991	3.0	991	3.0	1.091	153.7	LOS F	11.4	81.6	1.00	1.85	2.25	1.5
Approach		1406	3.0	1406	3.0	1.091	109.4	LOS F	11.4	81.6	0.70	1.44	1.58	6.3
NorthWest: Bridge St														
8	T1	353	3.0	353	3.0	0.270	0.4	LOS A	0.5	3.3	0.03	0.03	0.03	47.3
9	R2	344	3.0	344	3.0	1.111	152.7	LOS F	15.9	114.2	1.00	1.43	2.18	10.9
Approach		697	3.0	697	3.0	1.111	75.6	LOS F	15.9	114.2	0.51	0.72	1.09	12.1
SouthWest: Macquarie St														
10	L2	395	3.0	395	3.0	0.581	30.9	LOS C	15.1	108.4	0.84	0.83	0.84	30.0
12	R2	599	3.0	599	3.0	1.102	158.4	LOS F	29.4	211.3	1.00	1.37	2.26	9.6
Approach		994	3.0	994	3.0	1.102	107.7	LOS F	29.4	211.3	0.94	1.15	1.69	13.2
All Vehicles		3097	3.0	3097	3.0	1.111	101.2	LOS F	29.4	211.3	0.73	1.19	1.51	9.8

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

Movement Performance - Pedestrians

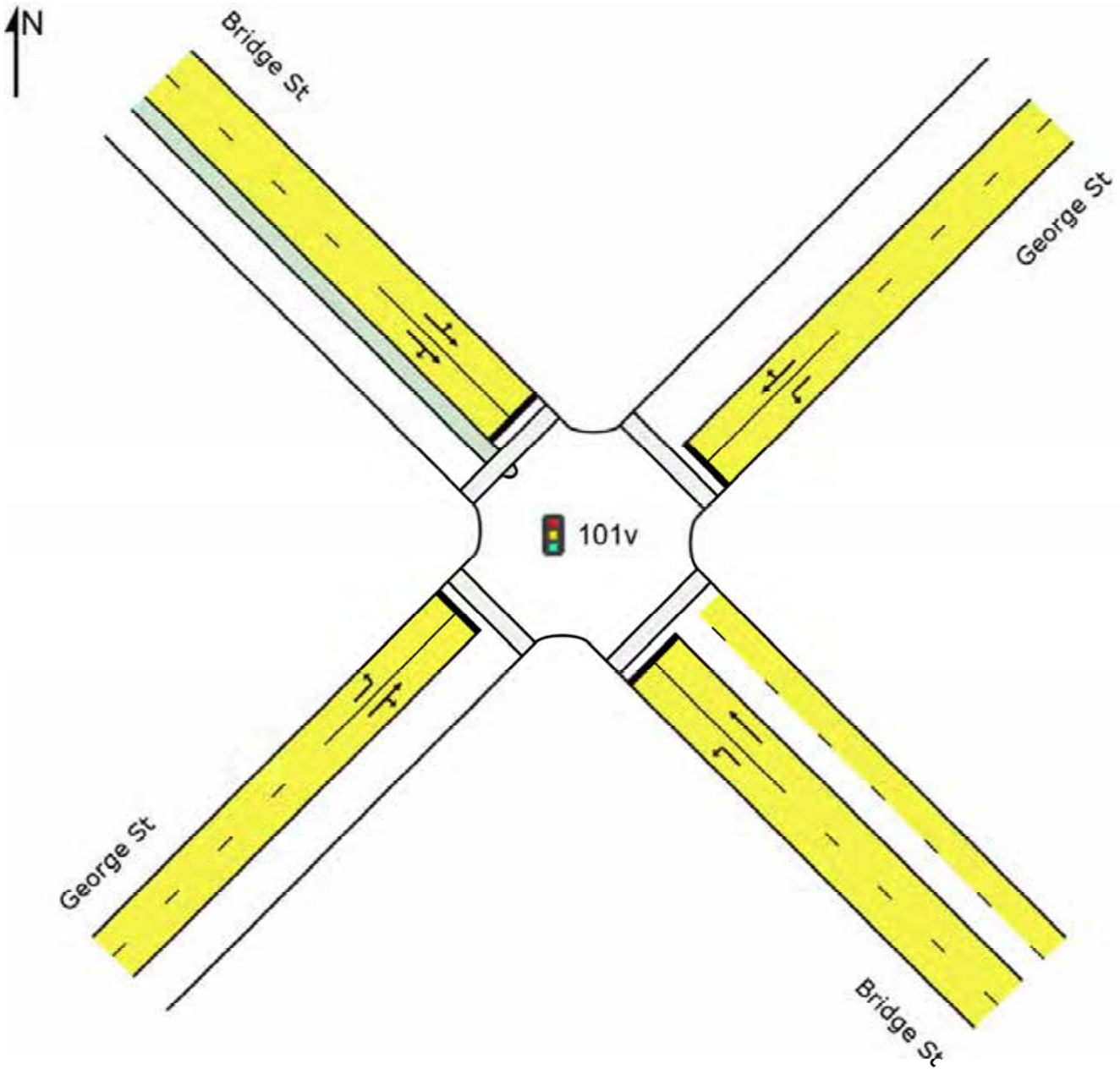
Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	21.1	LOS C	0.0	0.0	0.65	0.65
All Pedestrians		42	32.7	LOS D			0.80	0.80

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SITE LAYOUT

Site: 101v [2027PM S3 Bridge St/George St 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated



MOVEMENT SUMMARY

Site: 101v [2027PM S3 Bridge St/George St 15-16pm]

Network: N101 [Windsor-2027PM S3 15-16pm]

New Site
Site Category: (None)
Signals - Fixed Time Coordinated Cycle Time = 100 seconds (Network User-Given Cycle Time)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
SouthEast: Bridge St														
1	L2	23	3.0	21	3.0	0.015	4.8	LOS A	0.0	0.1	0.02	0.53	0.02	44.2
2	T1	1355	3.0	1252	3.0	0.824	0.6	LOS A	6.3	44.9	0.11	0.11	0.11	49.1
Approach		1378	3.0	1273 N1	3.0	0.824	0.7	LOS A	6.3	44.9	0.11	0.11	0.11	49.0
NorthEast: George St														
4	L2	1	3.0	1	3.0	0.012	55.3	LOS D	0.1	0.4	0.97	0.59	0.97	20.1
5	T1	1	3.0	1	3.0	0.023	49.9	LOS D	0.1	0.7	0.96	0.60	0.96	29.2
6	R2	1	3.0	1	3.0	0.023	54.5	LOS D	0.1	0.7	0.96	0.60	0.96	27.1
Approach		3	3.0	3	3.0	0.023	53.3	LOS D	0.1	0.7	0.96	0.60	0.96	26.0
NorthWest: Bridge St														
7	L2	1	3.0	1	3.0	0.444	7.3	LOS A	9.2	65.8	0.31	0.28	0.31	47.3
8	T1	692	3.0	692	3.0	0.444	2.7	LOS A	9.2	65.8	0.31	0.29	0.31	45.1
9	R2	66	3.0	66	3.0	0.444	9.6	LOS A	1.6	11.3	0.39	0.60	0.39	43.4
Approach		759	3.0	759	3.0	0.444	3.4	LOS A	9.2	65.8	0.32	0.32	0.32	44.8
SouthWest: George St														
10	L2	12	3.0	12	3.0	0.136	57.2	LOS E	0.6	4.2	0.98	0.68	0.98	25.9
11	T1	1	3.0	1	3.0	0.437	55.8	LOS D	1.2	8.9	1.00	0.73	1.00	27.4
12	R2	22	3.0	22	3.0	0.437	60.4	LOS E	1.2	8.9	1.00	0.73	1.00	19.1
Approach		35	3.0	35	3.0	0.437	59.2	LOS E	1.2	8.9	0.99	0.71	1.00	22.0
All Vehicles		2175	3.0	2070 N1	3.2	0.824	2.7	LOS A	9.2	65.8	0.20	0.20	0.20	45.9

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

N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

Movement Performance - Pedestrians

Mov ID	Description	Demand Flow ped/h	Average Delay sec	Level of Service	Average Back of Queue Pedestrian ped	Distance m	Prop. Queued	Effective Stop Rate
P1	SouthEast Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P2	NorthEast Full Crossing	21	3.9	LOS A	0.0	0.0	0.28	0.28
P3	NorthWest Full Crossing	21	44.2	LOS E	0.1	0.1	0.94	0.94
P4	SouthWest Full Crossing	21	3.4	LOS A	0.0	0.0	0.26	0.26
All Pedestrians		84	23.9	LOS C			0.61	0.61

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)
Pedestrian movement LOS values are based on average delay per pedestrian movement.
Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

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