Our Ref: 19502

5 November 2020

Costco Wholesale Australia Pty Ltd
17-21 Parramatta Road
LIDCOMBE NSW 2141

Attention: Mr Tim Hill

Dear Tim,

RE: COSTCO LAKE MACQUARIE
ADDENDUM TRAFFIC REPORT

The Transport Planning Partnership (TTPP) has prepared this addendum traffic report to review the traffic and parking related comments received from Lake Macquarie City Council (Council) and to provide response to address these comments.

1. Background

TTPP prepared a Transport Impact Assessment (TIA) report dated 30th July 2020 as part of the Development Application (DA/1166/2020) that was submitted to Lake Macquarie City Council (Council) for the proposed construction of a Costco retail store on part of Lot: 599 DP: 1228699, 2A Main Road, Boolaroo NSW.

Following the DA submission, Council raised comments and requested additional information in relation to the proposed development.

The structure of this addendum report is as follows:

- Section 2: Council's email primarily regarding a potential rat-running route to Fotheringham Street and the need to remove the Fotheringham Street connection with Munibung Road. TTPP's responses to this concern are provided.
- Section 3: Council's RFI dated 18th September 2020 in relation to traffic and transport issues such as parking provision, traffic and vehicle access, traffic network upgrades and Fotheringham Street. TTPP's responses to these comments are provided.

2. Response to Council Traffic Engineer's Comments

Council's Traffic Engineer has raised the following comments:

> ***Traffic Generating Development***
>
> *In general the TIA accurately reflects ongoing discussions between HCCDC, TfNSW, and LMCC, with adjustments made for additional floor space.*
>
> *Unlike the HCCDC model, Costco have allowed a considerable proportion of traffic to enter by the proposed Fotheringham Street entrance, including 50% of Lake Road south bound traffic, and 100% of northbound traffic via Main Road. Furthermore, although the model indicates the Fotheringham Street/Main Road roundabout operates at a satisfactory LOS, it does not allow for Fotheringham Street to be connected to Munibung Road in accordance with the Pasminco Area Plan, and therefore excludes the considerable traffic volume that would be expected to utilise this route as a short cut both during peak and non peak periods. The TIA also fails to quantify the expected additional traffic utilising Main Road as a result of the development, and the impacts of this traffic (both speed and volume) on intersecting roads and the Boolaroo town centre.*
>
> *I have considerable concern regarding the use of Fotheringham Street and Main Road as key routes to the development. Fotheringham Street, including the Fotheringham Street/Main Road roundabout, has been designed as a residential street servicing a residential subdivision, including residential properties fronting. However the impact of connecting Fotheringham Street to both the development and Munibung Road is likely to result in it becoming sub-arterial in nature, utilised to relieve the arterial road network. This will create a significant future burden on both the residents of Fotheringham Street, and on Council to resolve the competing purposes of the road.*
>
> *In the absence of an updated model to demonstrate the future impact of the development on Fotheringham Street and Main Road, or to guide a review of the Pasminco area plan, suggestions to resolve this issue now could include:*
>
> - *Adjust the Pasminco Area Plan to remove the connection of Fotheringham Street with Munibung Road for motor vehicles, allowing a cycling and walking connection for permeability purposes (without modelling to demonstrate otherwise, this is the favoured position of the Infrastructure Assets Strategy team (including traffic and transport officers)). Access to the development would then be as reflected in the TIS without impact from short cut traffic, and could be considered suitable subject to analysis of the impact on Main Road and suitable measures being provided to mitigate this impact.*
> - *Do not provide a vehicle access from Fotheringham Street into the development and adjust the traffic model in the TIS to suit. This option would allow the development to proceed without the need to resolve the future use of*

Fotheringham Street. Under this option it is still considered that a high proportion of the traffic from the Speers Point/Warners Bay direction will likely use Main Road, and during peak times some traffic from the westlakes direction (Five Islands Road) may also utilise Main Road. A pedestrian and cycling link to the development from Fotheringham Street should still be provided for local access.

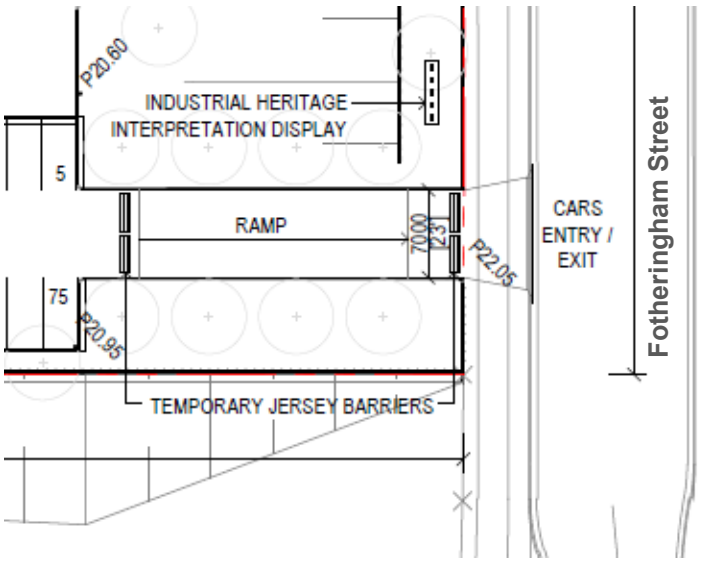
To mitigate the impacts on Main Road under both options, DAC could consider conditioning the provision of traffic calming works on the development, particularly through the Boolaroo town centre and adjacent to Speers Point Primary School. These works could include measures such as vertical or horizontal deflection devices, raised pedestrian crossings, a 40km/h High Pedestrian Activity Area, roundabouts at key intersections such as Main Road/Seventh Street, streetscape works, and intersection realignments such as at Second Street/Main Road. These measures will help to alleviate the pressures of the development on Main Road by reducing its attractiveness as an alternative to T. C. Frith Road, and will mitigate the impact of the additional traffic on intersections, residential and local areas, and vulnerable users such as pedestrians and cyclists. I am available to discuss suitable measures.

2.1. Traffic Modelling Update

It is understood that Council's primary concern is traffic potentially using Fotheringham Street as a rat-running route if Fotheringham Street was connected with Munibung Road. This would result in a significant burden on this road which is designed as a residential street.

Costco would like to continue to seek approval to construct a secondary access onto Fotheringham Street as shown in Figure 1 as this ultimately reduces the pressure on the Hague Road and Reserve Road accesses in the long term.

Figure 1: Fotheringham Street Access



However, Costco are aware that use of that access will not be allowed until upgrade works to Fotheringham Street are completed. Accordingly, Figure 1 illustrates that temporary jersey barriers will be installed at the top and bottom of the ramp to prevent use of the access in the short to medium term.

For modelling purposes, TTPP has updated the SIDRA modelling to assign all development traffic to the proposed site accesses on Munibung Road. This is a shift of 18% of development traffic using the initially proposed Fotheringham Street to the two access points on Munibung Road.

TTPP's SIDRA modelling that was included in the previous TIA report (dated 30th July 2020) was undertaken based on the traffic volumes provided by SMEC, with adjustment made to redistribute some Costco and Big Box development traffic to enter/exit the site via Fotheringham Street based on the following assumptions:

- 50% of Lake Road southbound traffic reassigned to enter via Fotheringham Street, and the remaining 50% to enter via Munibung Road
- all traffic coming from Main Road northbound, south of Fotheringham Street would enter via Fotheringham Street instead of Munibung Road access.

It is understood that Council does not support the proposed site access on Fotheringham Street until upgrade works are complete. TTPP has revised SIDRA modelling in this addendum to assign all site traffic to the proposed site accesses on Munibung Road only. The results are presented later in this addendum report. But firstly, the SIDRA modelling has been undertaken based on the updated input information provided by SMEC and an overview is provided below.

Since TTPP submitted the TIA report as part of the DA package to Council, SMEC has undertaken further SIDRA modelling to incorporate TTPP's recommendations on intersection layouts, including a left turn slip lane on the Munibung Road approach to the Lake Road - TC Frith and Main Road roundabout. In addition, SMEC has revised future traffic volumes due to re-distribution of traffic across the road network. Subsequently, TfNSW recommended changes to the traffic signal phasing for the Munibung Road - Bunning Access - Costco Access intersection.

TTPP has obtained from SMEC the revised Sidra modelling files and updated traffic volumes which were adopted in their '*Boolaroo TIA SIDRA Network Demand Sensitivity Analysis*' report dated 30th September 2020. The Sidra models that were obtained are consistent with the '*Scenario 5: 2032 Opt1 Access, Mitigation with Slip Lane – Dedicated RT*' scenario presented in the said report.

An overview of the SMEC model and traffic volumes is provided as follows:

- Redistribution of the 2032 traffic volumes based on traffic survey counts undertaken on 22nd and 25th August 2020. The turn volumes are provided in two scenarios for the PM peak and Saturday peak hours only:

  - 2032 Future Base Case + Background Growth (including residential subdivision traffic)
  - 2032 with Future Development under Option 1 access arrangement
- Traffic volumes are available for the following intersections only:
  - TC Frith Avenue - Main Road - Munibung Road - Lake Road
  - Main Road - Fotheringham Street - Parrott Street
  - Munibung Road - Hague Road
  - Munibung Road - Bunnings Access - Costco Access
- Scenario 5 Sidra model with Option 1 access arrangement as shown in Figure 2. Option 1 assumes that access to the development site would only occur on Munibung Road, via Hague Road and new Costco Access. No connection has been provided between the development and Fotheringham Street and Main Road.
- SMEC's recommended mitigation at TC Frith Avenue – Main Road – Munibung Road – Lake Road roundabout with the addition of a left turn slip lane on the Munibung Road approach.
- Dedicated right turn signal phases and layout at the Munibung Road – Bunnings Access – Costco Access.

Figure 2: SMEC Option 1 Access Arrangement

Source: SMEC

It is noted that the key intersections included in SMEC model and traffic volumes are consistent with the intersections assessed in TTPP's previous TIA report, but the Macquarie Road – Munibung Road – Myall Road intersection was excluded from SMEC's SIDRA modelling. Therefore, modelling results for the Macquarie Road – Munibung Road – Myall Road intersection remain the same as per TTPP's previous TIA report.

TTPP has updated the SIDRA modelling results in this addendum based on SMEC's forecast traffic volumes for year 2032 and revised SMEC's SIDRA modelling with the following changes:

- A review of SMEC traffic volumes indicates that only 50% of the residential traffic was assigned to the Fotheringham Street – Munibung Road intersection, and the remaining 50% was assigned to the proposed Fotheringham Street – Munibung Road. Adjustments have been made in this addendum report so that access to/from the residential subdivision would be via Fotheringham Street – Main Road intersection only. This is in

response to Council's requirement for not allowing the Fotheringham Street connection with Munibung Road in accordance with the Pasminco Area Plan.

There is no detail in the assessment undertaken by SMEC to document how the residential traffic has been assigned to the network. As such, the remaining 50% of residential traffic that has been added to the model has been distributed to the network based on the flow proportions of 2032 Future Base Case + Background Growth traffic volumes.

- Signal phasing at Munibung Road – Bunnings Access – Costco Access intersection has been updated to accommodate a standard single diamond phasing as per TfNSW's advice.

TTPP has assessed the following modelling scenarios in this addendum report.

- Scenario 1: 2020 Existing Base (as per SMEC's *'Boolaroo SIDRA Network Modelling'* report dated 18th September 2020)
- Scenario 2: 2032 Future Base (including background growth and residential subdivision traffic)
- Scenario 3: 2032 Future Base + Development traffic

Scenario 3 has incorporated SMEC's recommended intersection layout, plus TfNSW's advice on traffic signals. Refer to the modelled intersection layouts and phasing arrangements in Figure 3 to Figure 7.

Figure 3: TC Frith Ave-Main Rd-Munibung Rd-Lake Rd Modelled Intersection Layout

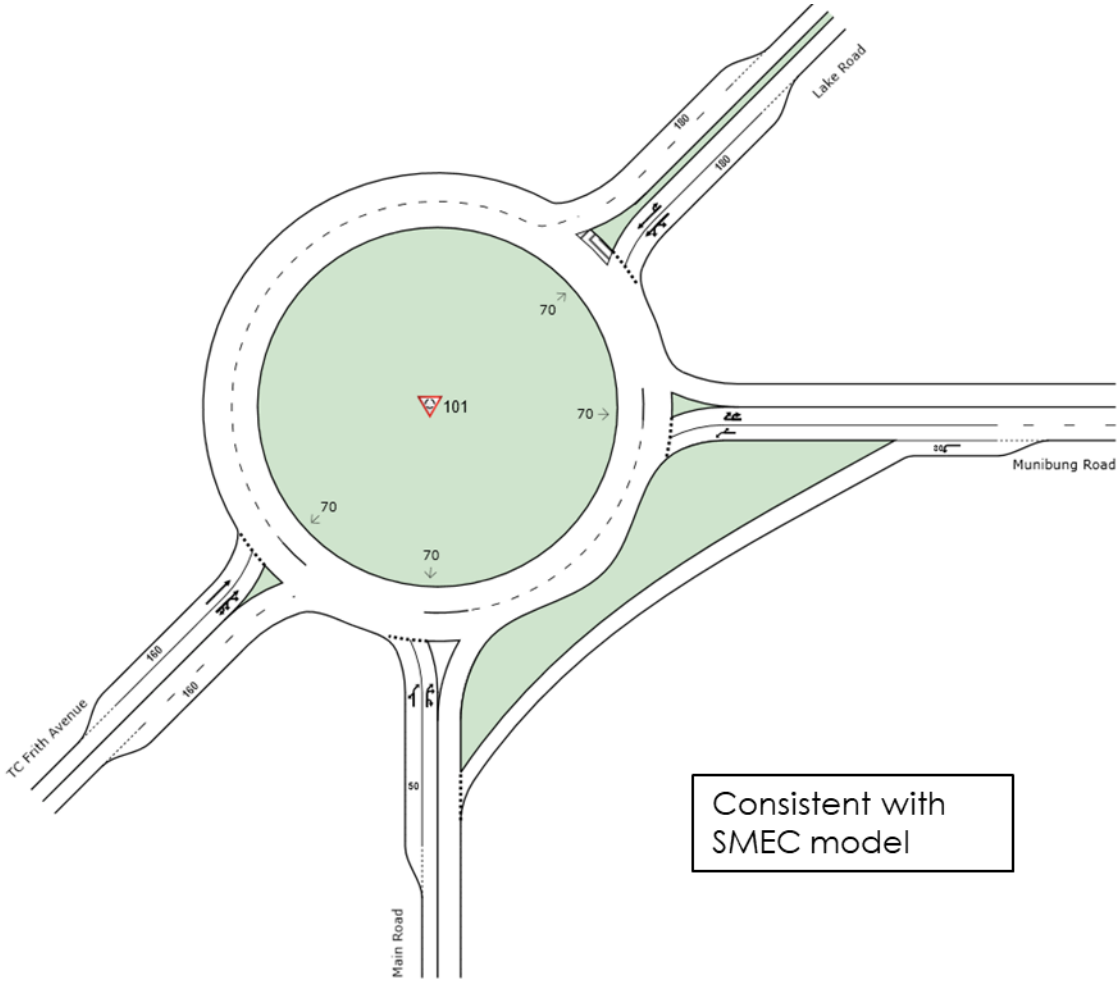


Figure 4: Parrott St-Main Rd-Fotheringham St Modelled Intersection Layout

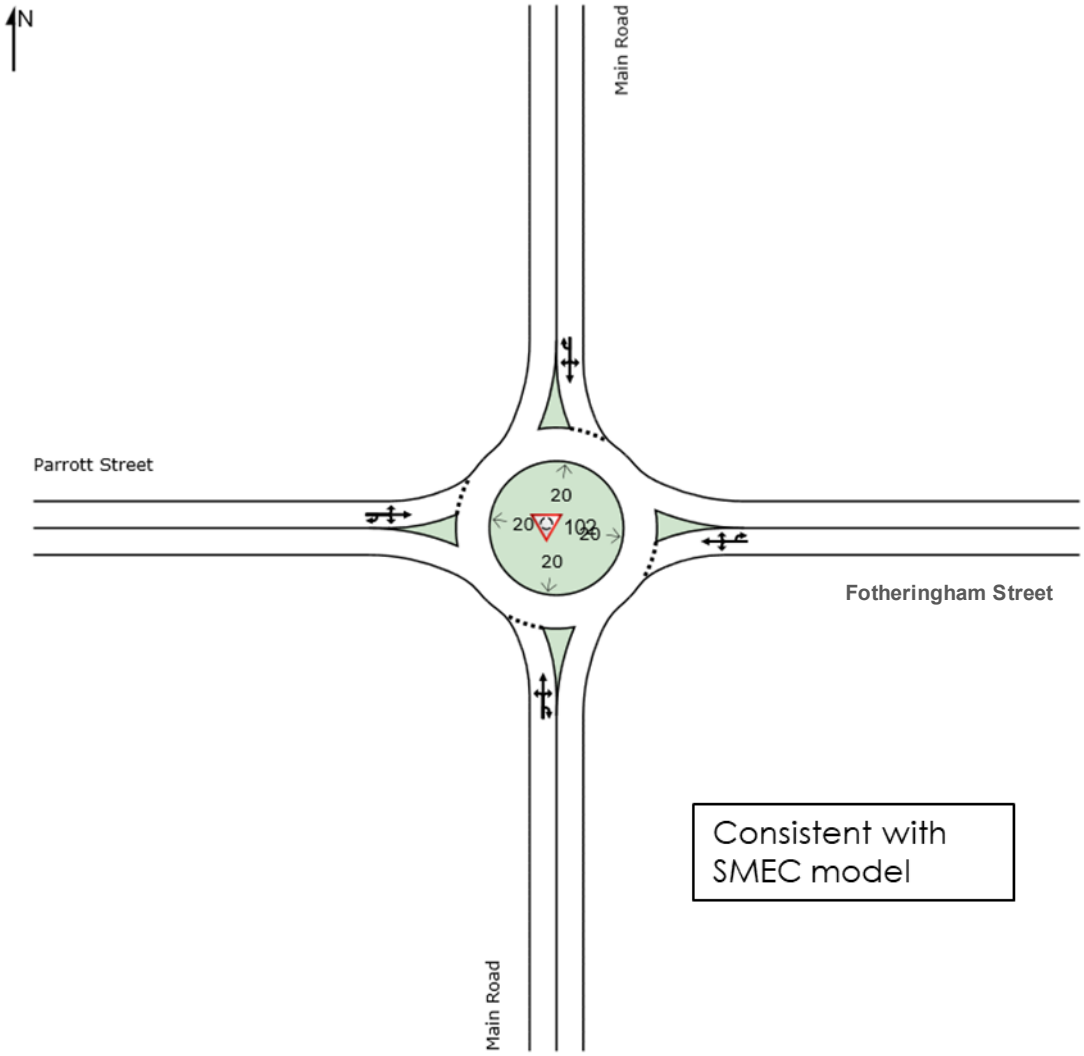


Figure 5: Munibung Rd-Hague Rd Modelled Intersection Layout

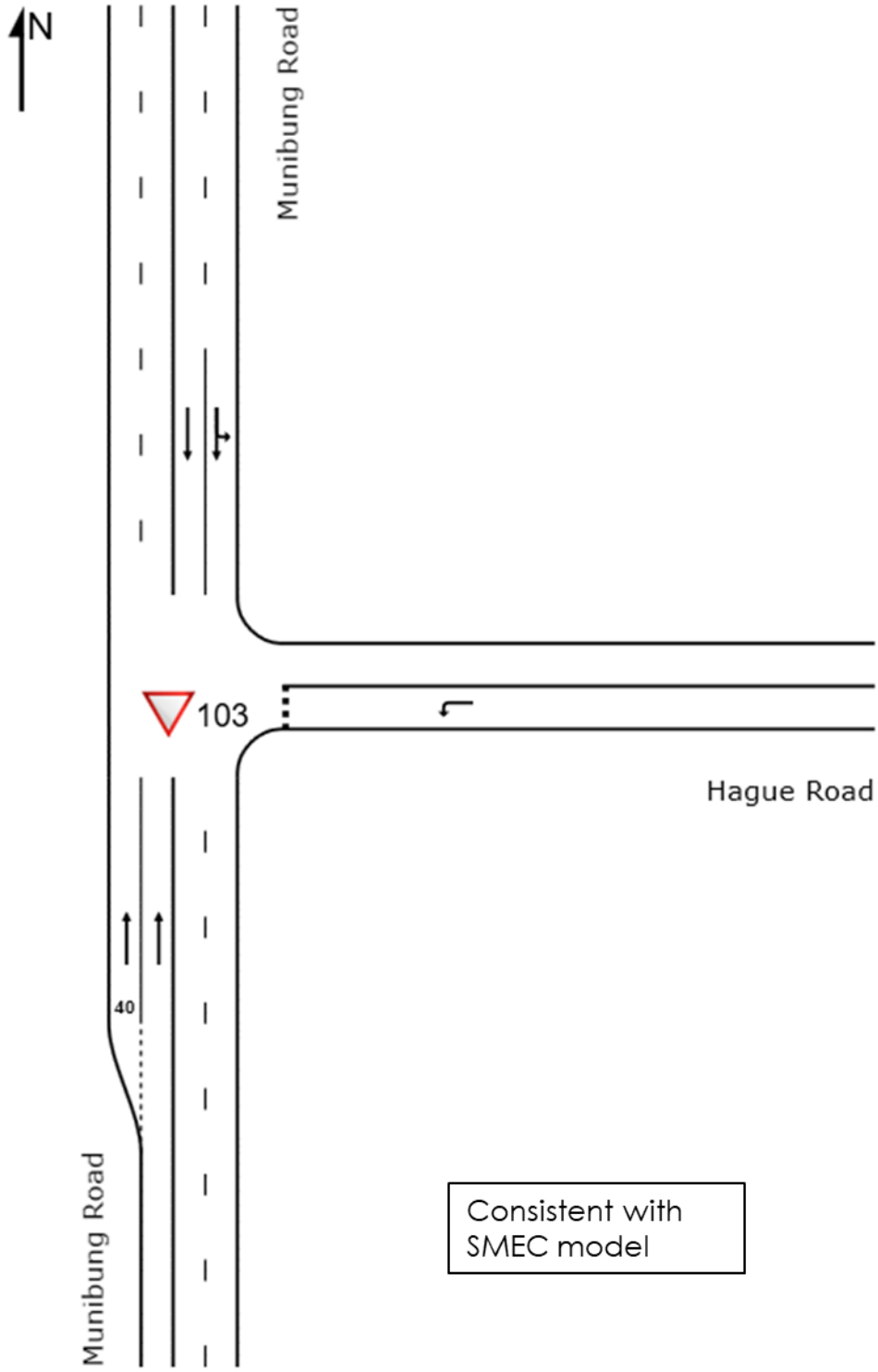


Figure 6: Munibung Road-Bunnings Access-Costco Access Intersection Layout

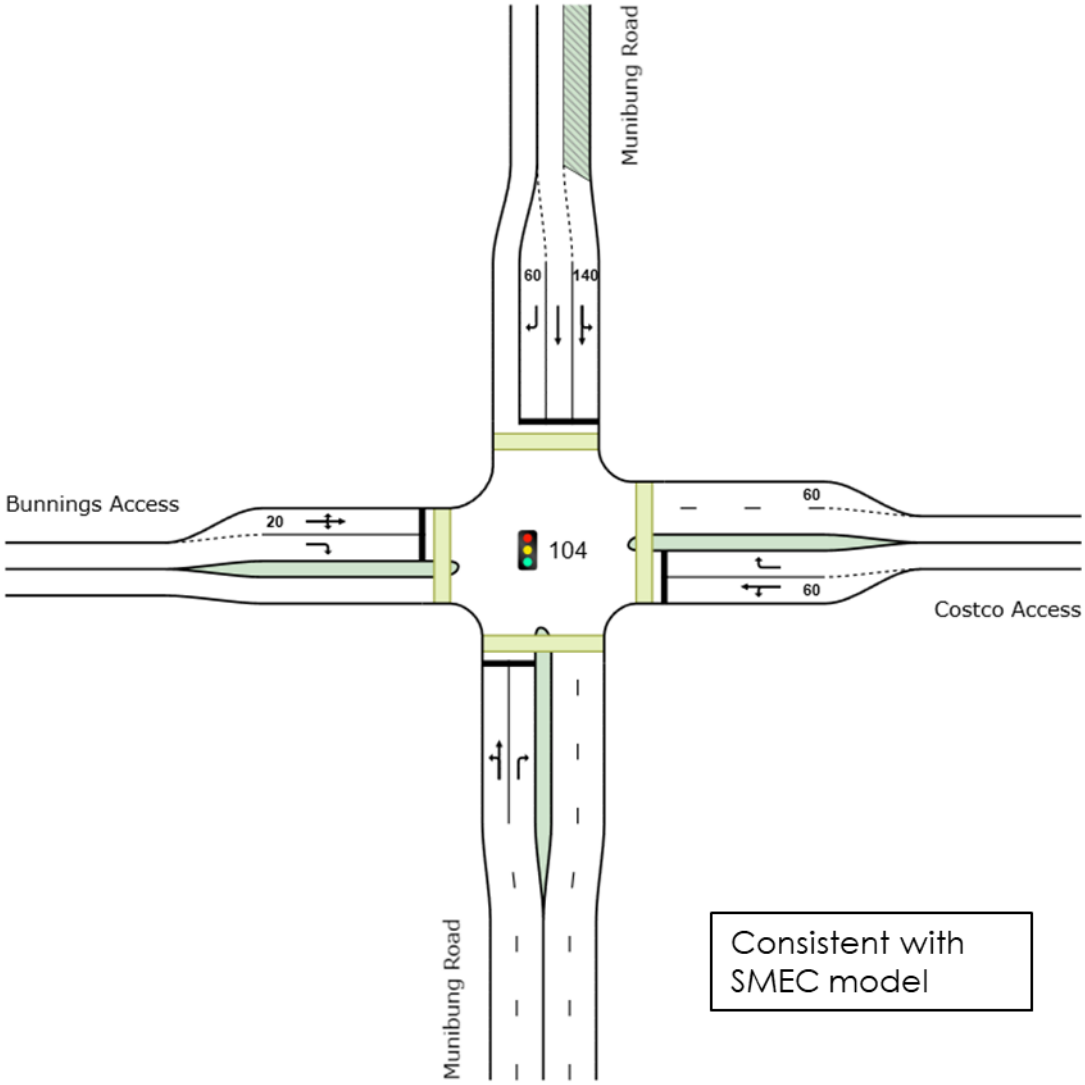


Figure 7: Munibung Road-Bunnings Access-Costco Access Phasing Diagram

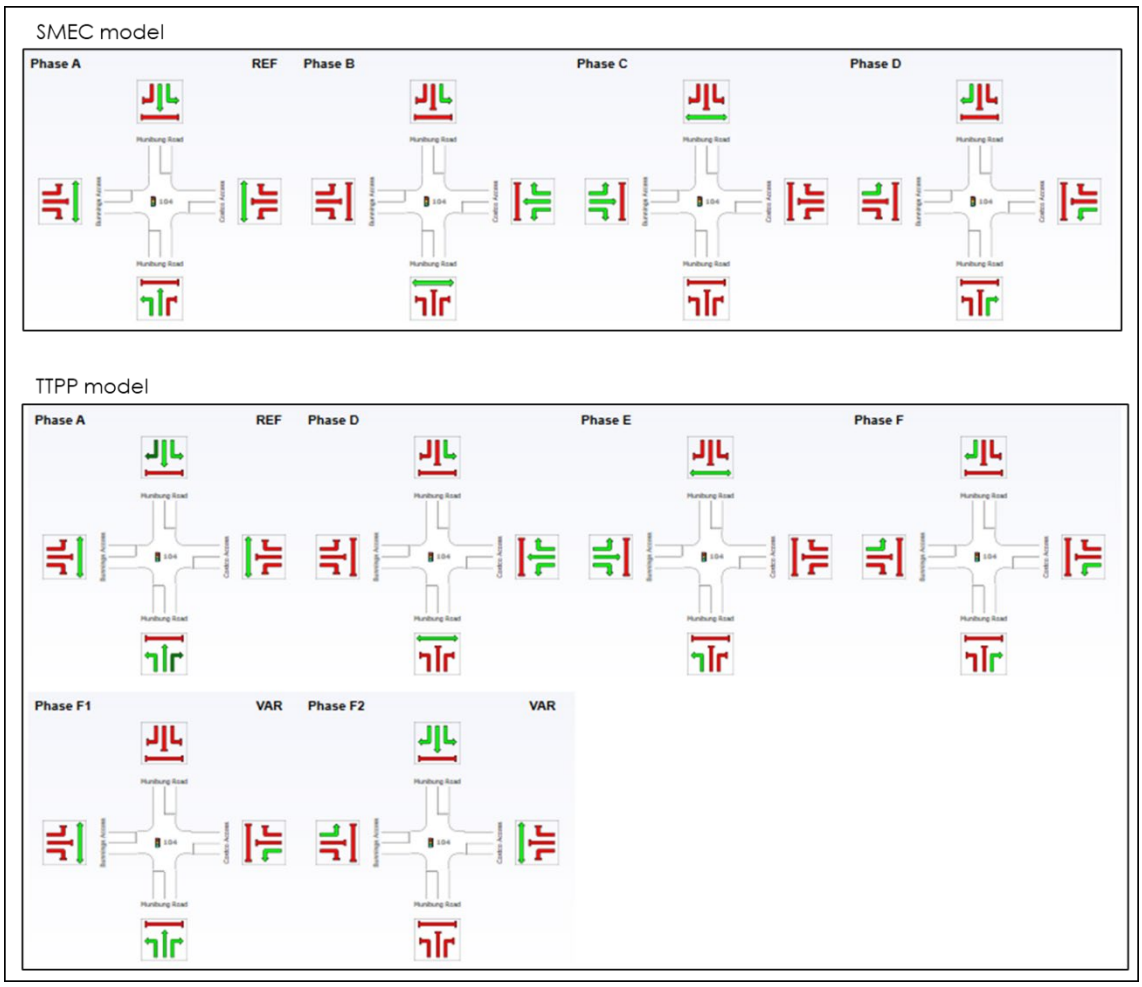


Figure 7 shows the traffic signal phasing adopted in the SMEC model. TfNSW required modification to the phasing adopted in the SMEC model for a standard diamond phase including Phase A, D, E, F, F1 and F2. It is required to provide a filtered right turn option in Phase A and a left turn movement into Bunnings Access Road in Phase C (now called Phase E).

These changes have been adopted in TTPP's model in response to TfNSW's required modifications in accordance with TfNSW Guides for Developing Standard for Single Diamond Overlap Phase (2009).

Figure 8 and Figure 9 present the Year 2032 future traffic volumes for the PM peak and Saturday peak respectively, on the basis that no connection is provided between Fotheringham Street and Munibung Road.

Figure 8: 2032 Future Base + Residential Traffic Volumes – PM Peak

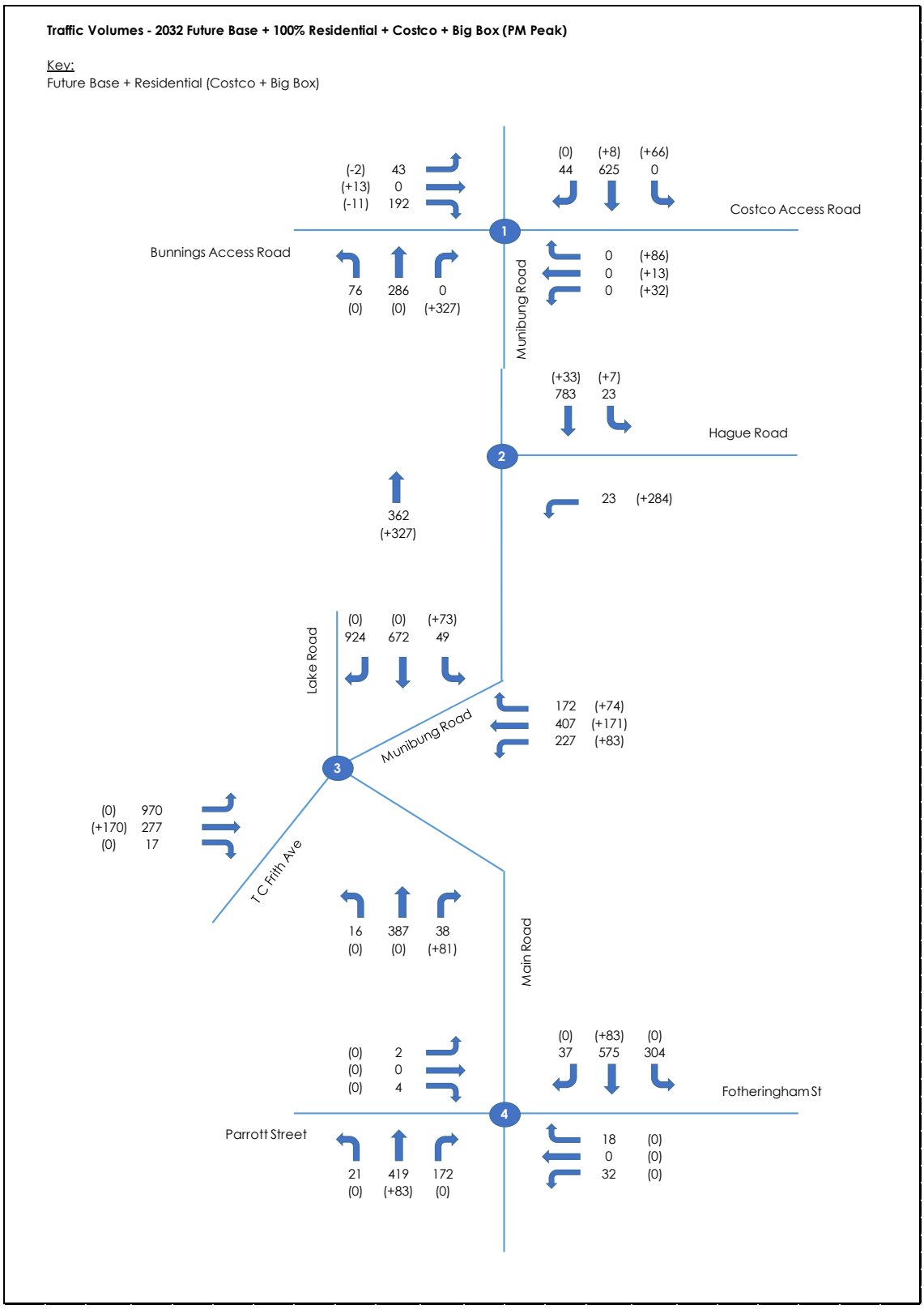
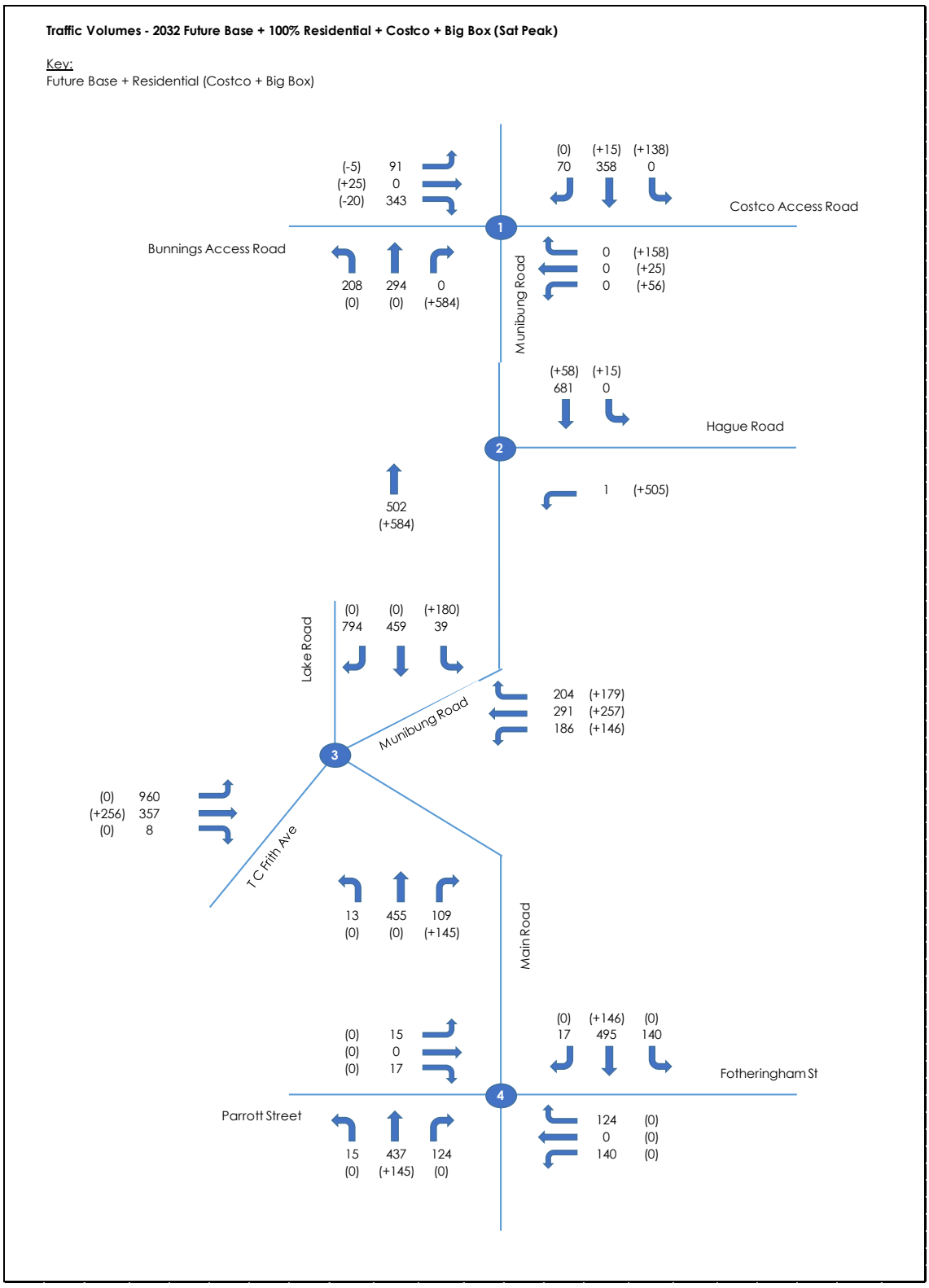


Figure 9: 2032 Future Base + Residential Traffic Volumes – Saturday Peak



The Scenario 1 (existing base) modelling results extracted from the SMEC report are shown in Table 1. The updated traffic modelling results are presented in Table 2 for Scenario 2 (future base with residential subdivision traffic) and Table 3 for Scenario 3 (future base with residential and development traffic).

Table 1: Scenario 1: 2020 Existing Base (SMEC) Level of Service

Intersection	PM Peak			Saturday Peak		
	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)
TC Frith Ave-Main Rd-Munibung Rd-Lake Rd	31	C	48	20	B	42
Main Rd-Fotheringham St-Parrott St	13	A	1	13	A	2
Munibung Rd-Hague Rd	13	A	1	14	A	1
Munibung Rd-Bunnings Access-Costco Access	32	C	36	23	B	55

Source: 'Boolaroo SIDRA Network Modelling' (SMEC, 18th September 2020)

Table 2: Scenario 2: 2032 Future Base + Residential Subdivision Level of Service

Intersection	PM Peak									Saturday Peak								
	TTPP July 2020 TIA (50% Residential)[2]			SMEC September 2020 Model (50% Residential)[3]			TTPP Addendum (100% Residential)[4]			TTPP July 2020 TIA (50% Residential)[2]			SMEC September 2020 Model (50% Residential)[3]			TTPP Addendum (100% Residential)[4]		
	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)
TC Frith Ave-Main Rd-Munibung Rd-Lake Rd	53	D	87	25	B	101	26	B	135	336	F	720	24	B	92	28	B	107
Main Rd-Fotheringham St-Parrott St	11	A	22	14	A	37	14	A	70	10	A	22	14	A	24	14	A	33
Munibung Rd-Hague Rd	-	-	-	7	A	1	7	A	1	-	-	-	7	A	0	7	A	0
Munibung Rd-Bunnings Access-Costco Access[1]	13	A	11	26	B	76	41	C	135	478	F	638	41	C	174	37	C	157

Note:

1. TTPP updated phasing for a standard single diamond arrangement as per TfNSW's advice.
2. In TTPP July 2020 TIA model, 2032 future base scenario has not included any mitigation measures
3. In SMEC model, 50% of residential subdivision traffic has been assigned to the Fotheringham Street-Main Road intersection and the remaining 50% to the Fotheringham Street-Munibung Road intersection.
4. In TTPP model, 100% of residential subdivision traffic has been assigned to the Fotheringham Access-Main Road intersection.

Table 3: Scenario 3: 2032 Future Base + Residential Subdivision + Development Level of Service

Intersection	PM Peak									Saturday Peak								
	TTPP July 2020 TIA (50% Residential)			SMEC September 2020 Model (50% Residential)[2]			TTPP Addendum (100% Residential)[3]			TTPP July 2020 TIA (50% Residential)			SMEC September 2020 Model (50% Residential)[2]			TTPP Addendum (100% Residential)[3]		
	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)
TC Frith Ave-Main Rd-Munibung Rd-Lake Rd	35	C	68	128	F	600	187	F	880	174	F	288	287	F	1074	346	F	1242
Main Rd-Fotheringham St-Parrott St	12	A	34	15	A	41	15	A	67	13	A	43	15	B	31	15	B	42
Munibung Rd-Hague Rd	7	A	8	8	A	14	8	A	15	8	A	49	10	A	183	10	A	43
Munibung Rd-Bunnings Access-Costco Access[1]	25	B	90	39	C	118	48	D	156	44	D	188	96	F	196	54	D	196

Note:

1. TTPP updated phasing for a standard single diamond arrangement as per TfNSW's advice.
2. In SMEC model, 50% of residential subdivision traffic has been assigned to the Fotheringham Street-Main Road intersection and the remaining 50% to the Fotheringham Street-Munibung Road intersection.
3. In TTPP model, 100% of residential subdivision traffic has been assigned to the Fotheringham Access-Main Road intersection.

Traffic modelling results indicate that the proposed mitigation measures at intersections would accommodate the future year background growth and estimated residential subdivision traffic (Scenario 2). This assumes no connection between Fotheringham Street and Munibung Road, and also all site traffic has been assigned to Munibung Road accesses only.

Based on Table 3, the key intersections would operate satisfactorily even with the additional development traffic, with the exception of TC Frith Avenue – Main Road – Munibung Road – Lake Road roundabout. This roundabout is anticipated to deteriorate to LoS F mainly due to the high delays experienced by vehicles approaching from Lake Road in the evening peak and from TC Frith Avenue in the Saturday peak. These results are consistent with the TTPP's previous TIA as the intersection delay is expected to reduce significantly as compared with the results without the provision of the left turn slip lane on Munibung Road approach to the roundabout.

Nonetheless, Scenario 3 results suggest that the resulting queues would not cause any lane blockages at the subject intersections, even with the additional development traffic.

In addition, the network performance results are summarised in Table 4 and Table 5.

Table 4: 2032 Network Performance – PM Peak

Performance Measure	S2: 2032 Future Base			S3: 2032 Future Base + Development		
	TTPP July 2020 TIA (50% Residential)[2]	SMEC September 2020 Model (50% Residential)[3]	TTPP Addendum (100% Residential)[4]	TTPP July 2020 TIA (50% Residential)	SMEC September 2020 Model (50% Residential)[3]	TTPP Addendum (100% Residential)[4]
Network LoS	B	B	C	B	D	E
Speed Efficiency	0.85	0.84	0.79	0.81	0.56	0.48
Travel Time Index	8.38	8.23	7.70	7.93	5.14	4.28
Ave. Travel Speed (km/h)	51.3	50.1	47.3	48.8	33.5	28.9

Note:

1. TTPP updated phasing for a standard single diamond arrangement as per TfNSW's advice.
2. In TTPP July 2020 TIA model, 2032 future base scenario has not included any mitigation measures
3. In SMEC model, 50% of residential subdivision traffic has been assigned to the Fotheringham Street-Main Road intersection and the remaining 50% to the Fotheringham Street-Munibung Road intersection.
4. In TTPP model, 100% of residential subdivision traffic has been assigned to the Fotheringham Access-Main Road intersection.

Table 5: 2032 Network Performance – Saturday Peak

Performance Measure	S2: 2032 Future Base			S3: 2032 Future Base + Development		
	TTPP July 2020 TIA (50% Residential)[2]	SMEC September 2020 Model (50% Residential)[3]	TTPP Addendum (100% Residential)[4]	TTPP July 2020 TIA (50% Residential)	SMEC September 2020 Model (50% Residential)[3]	TTPP Addendum (100% Residential)[4]
Network LoS	E	C	C	D	E	E
Speed Efficiency	0.40	0.78	0.77	0.65	0.34	0.34
Travel Time Index	3.38	7.57	7.50	6.07	2.67	2.68
Ave. Travel Speed (km/h)	24.2	46.5	46.1	38.8	20.3	20.3

Note:

1. TTPP updated phasing to standard single diamond arrangement as per TfNSW's advice.
2. In TTPP July 2020 TIA model, 2032 future base scenario has not included any mitigation measures
3. In SMEC model, 50% of residential subdivision traffic has been assigned to the Fotheringham Street-Main Road intersection and the remaining 50% to the Fotheringham Street-Munibung Road intersection.
4. In TTPP model, 100% of residential subdivision traffic has been assigned to the Fotheringham Access-Main Road intersection.

As shown in Table 4 and Table 5, The updated modelled network is anticipated to operate at LoS E for both evening and Saturday peak periods with vehicles travelling at an average speed of 20km/h to 30km/h during these peak periods.

Based on the results presented above, the updated intersection performance would generally be worse as compared with the July 2020 TIA report due to the removal of development connection through Fotheringham Street. This is expected as all development traffic is now consolidated to the Munibung Road access points instead of distributing some traffic to Fotheringham Street. The additional 18% development traffic that were previously assigned to Fotheringham Street access has now been added to Munibung Road access points and TC Frith Avenue – Main Road – Munibung Road – Lake Road roundabout.

As mentioned in Section 2.1, SIDRA modelling has been undertaken with no site traffic being assigned to the Fotheringham Street access, and the above results indicate that both Munibung Road accesses could operate acceptably. However, Costco would like to continue to seek approval to construct the Fotheringham Street access, noting the use of that access will not be allowed until upgrade works to Fotheringham Street are completed as part of the residential subdivision. This would ultimately reduce the pressure on the Hague Road and Reserve Road accesses in the long term.

Temporary jersey barriers will be installed at the top and bottom of the ramp to prevent use of the access in the short to medium term

2.2. Impacts to Main Road

Table 6 provides a summary of the mid-block traffic volumes on Main Road, south of Fotheringham Street for year 2032.

Table 6: Main Road Traffic Volumes (South of Fotheringham Street)

Direction	Number of Lanes in each direction	PM Peak				Saturday Peak			
		Future Base	Development	Total	% Increase	Future Base	Development	Total	% Increase
Northbound	1 lane	612	83	695	14%	576	145	721	25%
Southbound	1 lane	611	83	694	14%	652	146	798	22%

As shown in Table 6, the proposed development would account for a 14% increase of Main Road traffic in the evening peak and 22% to 25% in the Saturday peak, as compared with the future base without the proposed development.

In accordance with Austroads Guide to Traffic Management Part 3 (2020), the typical mid-block capacity of a two-lane undivided road is 900 vehicles per lane per hour in an urban road.

Based on this, the post-development mid-block traffic volumes on Main Road would still be within the road's theoretical capacity.

It is also understood that Council's Traffic Engineer has requested traffic calming works to reduce Main Road as an alternative to TC Frith Avenue. However, an investigation of the post-development mid-block volumes indicate that TC Frith Avenue has higher traffic volumes as a higher hierarchy road and therefore is the more preferred route as compared with Main Road.

Table 7: Main Road and TC Frith Avenue Mid-Block Traffic Volume Comparison (2032 Future Base + Residential Subdivision + Development)

Direction	PM Peak		Saturday Peak	
	TC Frith Ave	Main Rd	TC Frith Ave	Main Rd
Northbound	1,434	695	1,581	721
Southbound	1,518	694	1,355	798
Total	2,952	1,389	2,936	1,519

TC Frith Avenue is signposted at 70km/h with limited opportunities for on-street parking both sides of the road. There are only a few side roads along TC Frith Avenue.

By contrast, Main Road is signposted at 50km/h between the TC Frith Avenue-Main Road-Munibung Road-Lake Road roundabout and The Esplanade, in which contains two 40km/h School Zones (8-9:30am and 2:30-4pm on school days). A number of traffic calming measures

and facilities are already in place that would reduce travel speed in a relatively more interrupted traffic flow environment as compared with TC Frith Avenue, as follows:

- One wombat crossing
- Three pedestrian zebra crossings (one of which with kerb build out)
- One mid-block signalised pedestrian crossing
- Edgeline marking.
- On-street parking which interrupts traffic flows along Main Road.

While traffic calming measures are beneficial to road users in the proximity of the proposed Costco development and other nearby developments, the need for further local area traffic management (LATM) measures should be carefully considered not just to address the impact of the proposed Costco development, but also the existing traffic conditions and other future developments such as the residential subdivision. As such, the need for further traffic calming measures on Main Road should be investigated by Council in an area wide study rather than in specific relation to this DA.

3. Response to Council RFI

In addition, Council has raised a number of traffic and parking related matters in their Request for Information (RFI) in an email dated 18 September 2020.

TTPP provides the following additional information in response to Council's RFI. Other items are not related to traffic and transport and are therefore addressed by other specialists.

RFI:

5. Car Parking – Further justification for excess parking is required. Parking should be justified against parking surveys of similar facilities which are currently in operation

TTPP Response:

The proposed development includes provision of 822 car parking spaces, with a breakdown as follows:

- 779 customer spaces (including accessible spaces)
- 8 tyre centre spaces
- 35 staff spaces

It is noted that the above proposed parking provision exceeds the DCP car parking requirement of 347 car parking spaces, including 340 spaces for retail use and 7 spaces for tyre centre. Table 8 provides a summary of the required car parking provision based on the DCP rates for bulky good premises.

Table 8: DCP Car Parking Requirement

Land Use	Area	Sub-Area	GFA (m^2)	LMDCP 2014 Car Parking Rate	Car Parking Requirement (Spaces)
Bulky Good Premise	Costco retail (excluding the 136 m^2 employee locker area)	Building Area	13,328	Two spaces, plus one space per 40m^2 GFA	**335.2**
		Food Service	110	Two spaces, plus one space per 40m^2 GFA	**4.8**
	Tyre centre	-	212	Two spaces, plus one space per 40m^2 GFA	**7.3**
	Total	**-**	**13,650**	**-**	**347.0**

It is of note, that Costco has consistently provided a higher level of parking to address their specific needs. For example the parking provision at recently completed Costco sites is tabulated below in Table 9.

Table 9: Car Parking Supply of Other Costco Sites

Costco Site	Building Area (m^2)	Parking Supply	Parking Rate (parking space per 100m^2 of building area	Costco Lake Macquarie Parking Requirement (Retail Use)
Perth	13,653.7	842 (incl. 19 accessible)	6.17	829
Ipswich	13,653.6	823 (incl. 17 accessible)	6.03	810
Epping	13,720	764 (incl. 16 accessible)	5.57	748
Average			**5.92**	**796**

By using the rates obtained from other Costco sites, the proposed retail use of the development (including tyre centre) will require 748 to 829 car parking spaces, with an average of 796 car parking spaces.

Although the proposed provision of 822 car parking spaces is higher than the DCP requirement, it is comparable with other Costco sites and is expected to be sufficient to accommodate the parking demands at the proposed site. Therefore, the proposed parking provision is satisfactory.

RFI:

6. *Traffic and Vehicle Access – Clarification is sought (sic) for the following matters: - The Statement of Environmental Effects identifies the entrance off the Reserve Road as being for heavy vehicles only but the line marking and signage plan on the civil plans does not restrict this entrance. - Civil plans show the B-Double heavy vehicle access leaving via Hague Road, while the SEE states that servicing will all be from the new access road. Note. A B-double is unlikely to be able to make the left turn from Hague Road on to Munibung Road and as such will not utilise this egress.*

TTPP Response:

This item has been addressed by others.

RFI:

7. Traffic Network upgrades – There are a number of variations in outcomes and recommendations between TTPP and SMEC Traffic Impact Assessments. The applicant is required to clearly identify which recommendations proposed are being sought and who is proposed to become responsible for the required upgrades.

TTPP Response:

As discussed in Section 2.1, traffic volume flows and SIDRA models provided by SMEC have been adopted in this assessment. The traffic models assessed in this addendum have included the traffic mitigation measures mutually recommended by TTPP and SMEC. However, adjustments have been made such that 100% of residential subdivision traffic is assigned to the Fotheringham Street – Main Road intersection to address Council's requirement of not connecting Fotheringham Street to Munibung Road. In addition, single diamond signal phasing arrangement as advised by TfNSW has been adopted at the Munibung Road – Bunnings Access – Costco Access.

Post-development scenario results indicate that the Munibung Road – Bunnings Access – Costco Access intersection would operate satisfactorily during peak periods even with the removal of connection between Fotheringham Street and Munibung Road.

RFI:

10. Fotheringham Street – There has been concern raised regarding the use of Fotheringham Street and Main Road as key access routes and the impact this would have on the local traffic network. Is there potential to remove this access and would this have any impact to emergency access for the development?

TTPP Response:

The connection between Fotheringham Street and Munibung Road has been removed in this addendum assessment in response to Council's requirement for not allowing Fotheringham Street to be connected to Munibung Road in accordance with the Pasminco Area Plan.

A conservative modelling has been undertaken to demonstrate that the Hague Road and Reserve Road accesses have sufficient capacity to accommodate all site traffic to/from the subject development. These site accesses are expected to operate acceptably at Los D or better.

Notwithstanding, Costco would like to continue to seek approval to construct the Fotheringham Street access, noting the use of that access will not be allowed until upgrade works to Fotheringham Street are completed as part of the residential subdivision. This would

ultimately reduce the pressure on the Hague Road and Reserve Road accesses in the long term.

Temporary jersey barriers will be installed at the top and bottom of the ramp to prevent use of the access in the short to medium term.

4. Summary and Conclusion

TTPP has prepared this report as an addendum to the Transport Impact Assessment dated 30 July 2020 in response to the comments and request for information raised by Council.

TTPP and SMEC recommendations are now consistent for the intersection layout as SMEC has revised their recommendations to be aligned with TTPP's recommendation. This is reflected in SMEC's Sidra models *'Scenario 5: 2032 Opt1 Access, Mitigation with Slip Lane – Dedicated RT'* scenario presented in *'Boolaroo TIA SIDRA Network Demand Sensitivity Analysis'* report dated 30th September 2020.

TTPP modified the SMEC's model with adjustment to traffic volumes to ensure no direct connection is provided between Fotheringham Street and Munibung Road, and also revision of traffic signal phasing at the Munibung Road – Bunnings Access – Costco Access to allow a standard single diamond phasing as per TfNSW's advice. Traffic modelling results indicate that the proposed mitigation measures at intersections could accommodate the future year background growth and estimated residential subdivision traffic.

Post-development modelling results indicate that Post-development scenario results indicate that the Munibung Road – Bunnings Access – Costco Access intersection would operate acceptably during peak periods even with the removal of connection between Fotheringham Street and Munibung Road. The TC Frith Avenue – Main Road – Munibung Road – Lake Road roundabout would continue to operate at LoS F in both peak periods as consistent with the TTPP's previous TIA, as the intersection delay is expected to reduce

significantly as compared with the results without the provision of the left turn slip lane on Munibung Road approach to the roundabout.

Table 10 provides a summary of the amended traffic modelling results.

Table 10: Post-Development Level of Service Summary

Intersection	PM Peak			Saturday Peak		
	Ave Delay (s)	LoS	95th %tile Queue Length (m)	Ave Delay (s)	LoS	95th %tile Queue Length (m)
TC Frith Ave-Main Rd-Munibung Rd-Lake Rd	187	F	880	346	F	1242
Main Rd-Fotheringham St-Parrott St	15	A	67	15	B	42
Munibung Rd-Hague Rd	8	A	15	10	A	43
Munibung Rd-Bunnings Access-Costco Access[1]	48	D	156	54	D	196

Costco would like to continue to seek approval to construct the Fotheringham Street access, noting the use of that access will not be allowed until upgrade works to Fotheringham Street are completed as part of the residential subdivision. In the short to medium term, temporary jersey barriers will be installed at the top and bottom of the ramp to prevent use of the access.

We trust the above is to your satisfaction. Should you have any queries regarding the above or require further information, please do not hesitate to contact the undersigned on 8437 7800.

Yours sincerely,

Ken Hollyoak
Director

Attachment One

SIDRA Results

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: 19502sid-201027 with SMEC upgrade (50 Resi)

Template: Default Site User Report

Site: 101 [TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - 2032 FB+Resi PM (SMEC) (Site Folder: 2032 Future Base + Resi PM)]

Network: 26 [2032 FB+Resi PM (Network Folder: 2032 FB+Resi)]

TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - Scenario 1
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1b	L3	17	0.0	17	0.0	0.533	18.1	LOS B	3.5	25.4	0.90	1.05	1.17	46.2
3a	R1	399	3.2	399	3.2	0.533	23.6	LOS B	3.5	25.4	0.90	1.04	1.17	52.2
12	R2	39	18.9	39	18.9	0.533	23.9	LOS B	3.1	23.1	0.88	1.04	1.17	33.5
12u	U	1	0.0	1	0.0	0.533	25.0	LOS B	3.1	23.1	0.88	1.04	1.17	33.5
Approach		456	4.4	456	4.4	0.533	23.4	LOS B	3.5	25.4	0.89	1.04	1.17	51.1
East: Munibung Road														
1	L2	199	0.5	199	0.5	0.162	4.1	LOS A	1.4	9.7	0.78	0.53	0.78	41.8
4a	L1	428	4.2	428	4.2	0.554	9.2	LOS A	5.2	37.8	1.00	1.02	1.18	53.4
6b	R3	181	1.7	181	1.7	0.334	16.9	LOS B	2.3	16.2	0.96	0.98	0.96	55.1
3u	U	1	0.0	1	0.0	0.334	18.3	LOS B	2.3	16.2	0.96	0.98	0.96	34.8
Approach		809	2.7	809	2.7	0.554	9.7	LOS A	5.2	37.8	0.93	0.89	1.03	52.9
NorthEast: Lake Road														
24b	L3	52	6.1	52	6.1	0.798	8.9	LOS A	14.1	100.6	1.00	0.93	1.27	52.1
24a	L1	589	2.9	589	2.9	0.798	9.4	LOS A	14.1	100.6	1.00	0.93	1.27	52.1
25	T1	973	1.4	973	1.4	0.798	14.0	LOS A	14.1	100.6	1.00	1.01	1.36	56.0
26u	U	1	0.0	1	0.0	0.798	21.8	LOS B	13.4	94.7	1.00	1.05	1.39	59.2
Approach		1615	2.1	1615	2.1	0.798	12.2	LOS A	14.1	100.6	1.00	0.98	1.32	54.7
SouthWest: TC Frith Avenue														
31	T1	1021	3.9	1021	3.9	0.790	15.8	LOS B	9.4	67.4	0.93	1.13	1.39	55.8
32a	R1	292	1.1	292	1.1	0.790	15.8	LOS B	9.4	67.4	0.92	1.12	1.34	44.6
32b	R3	15	7.1	15	7.1	0.790	18.8	LOS B	9.4	67.4	0.92	1.12	1.34	44.6
32u	U	3	0.0	3	0.0	0.790	19.4	LOS B	9.4	67.4	0.92	1.12	1.34	59.0
Approach		1331	3.3	1331	3.3	0.790	15.9	LOS B	9.4	67.4	0.93	1.13	1.38	54.4
All Vehicles		4211	2.9	4211	2.9	0.798	14.1	LOS A	14.1	100.6	0.95	1.02	1.27	54.0

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 102 [Parrott St/Main Rd/ Fotheringham St - 2032 FB+Resi PM (SMEC) (Site Folder: 2032 Future Base + Resi PM)]

Network: 26 [2032 FB+Resi PM (Network Folder: 2032 FB+Resi)]

Parrott St/Main Rd/ Fotheringham Rd - Scenario 1
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1	L2	22	4.8	22	4.8	0.379	4.2	LOS A	2.7	19.8	0.24	0.45	0.24	34.2
2	T1	441	4.3	441	4.3	0.379	4.4	LOS A	2.7	19.8	0.24	0.45	0.24	38.7
3	R2	91	4.7	91	4.7	0.379	9.1	LOS A	2.7	19.8	0.24	0.45	0.24	52.8
3u	U	1	0.0	1	0.0	0.379	11.1	LOS A	2.7	19.8	0.24	0.45	0.24	42.9
Approach		555	4.4	555	4.4	0.379	5.2	LOS A	2.7	19.8	0.24	0.45	0.24	43.3
East: Fotheringham Road														
4	L2	17	0.0	17	0.0	0.036	7.3	LOS A	0.2	1.4	0.67	0.67	0.67	45.7
5	T1	1	0.0	1	0.0	0.036	7.5	LOS A	0.2	1.4	0.67	0.67	0.67	36.7
6	R2	9	0.0	9	0.0	0.036	12.2	LOS A	0.2	1.4	0.67	0.67	0.67	46.5
6u	U	1	0.0	1	0.0	0.036	14.2	LOS A	0.2	1.4	0.67	0.67	0.67	53.7
Approach		28	0.0	28	0.0	0.036	9.2	LOS A	0.2	1.4	0.67	0.67	0.67	45.9
North: Main Road														
7	L2	160	2.6	160	2.6	0.576	4.7	LOS A	5.2	37.0	0.42	0.48	0.42	52.3
8	T1	605	2.4	605	2.4	0.576	4.9	LOS A	5.2	37.0	0.42	0.48	0.42	47.4
9	R2	39	2.7	39	2.7	0.576	9.6	LOS A	5.2	37.0	0.42	0.48	0.42	33.7
9u	U	1	0.0	1	0.0	0.576	11.6	LOS A	5.2	37.0	0.42	0.48	0.42	46.0
Approach		805	2.5	805	2.5	0.576	5.1	LOS A	5.2	37.0	0.42	0.48	0.42	48.1
West: Parrott Street														
10	L2	2	0.0	2	0.0	0.009	4.7	LOS A	0.0	0.3	0.58	0.61	0.58	23.1
11	T1	1	0.0	1	0.0	0.009	5.2	LOS A	0.0	0.3	0.58	0.61	0.58	49.8
12	R2	4	0.0	4	0.0	0.009	9.3	LOS A	0.0	0.3	0.58	0.61	0.58	37.1
12u	U	1	0.0	1	0.0	0.009	11.4	LOS A	0.0	0.3	0.58	0.61	0.58	14.1
Approach		8	0.0	8	0.0	0.009	7.9	LOS A	0.0	0.3	0.58	0.61	0.58	34.2
All Vehicles		1397	3.2	1397	3.2	0.576	5.3	LOS A	5.2	37.0	0.35	0.47	0.35	46.7

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 103 [Munibung Road/Hague Road - 2032 FB+Resi PM (SMEC) (Site Folder: 2032 Future Base + Resi PM)]

Network: 26 [2032 FB+Resi PM (Network Folder: 2032 FB+Resi)]

Munibung Road/Hague Road - Scenario 1
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
11	T1	380	3.3	380	3.3	0.101	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		380	3.3	380	3.3	0.101	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
East: Hague Road														
21	L2	24	4.3	24	4.3	0.026	7.3	LOS A	0.1	0.8	0.41	0.59	0.41	29.4
Approach		24	4.3	24	4.3	0.026	7.3	LOS A	0.1	0.8	0.41	0.59	0.41	29.4
North: Munibung Road														
24	L2	24	4.3	24	4.3	0.215	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	28.1
5	T1	784	2.7	784	2.7	0.215	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	58.7
Approach		808	2.7	808	2.7	0.215	0.2	NA	0.0	0.0	0.00	0.02	0.00	55.6
All Vehicles		1213	3.0	1213	3.0	0.215	0.3	NA	0.1	0.8	0.01	0.02	0.01	56.6

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

Site: 104 [Munibung Road/Bunnings Access/ Costco Access - 2032 FB+Resi PM (SMEC) (Site Folder: 2032 Future Base + Resi PM)]

Network: 26 [2032 FB+Resi PM (Network Folder: 2032 FB+Resi)]

Munibung Road/Bunnings Access/Costco Access - Scenario 1
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Sequence1
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
1	L2	80	6.6	80	6.6	* 0.596	27.2	LOS B	10.6	75.9	0.89	0.78	0.89	24.5
2	T1	284	1.5	284	1.5	0.596	21.6	LOS B	10.6	75.9	0.89	0.78	0.89	37.6
3	R2	1	0.0	1	0.0	0.007	38.0	LOS C	0.0	0.2	0.93	0.59	0.93	20.2
Approach		365	2.6	365	2.6	0.596	22.8	LOS B	10.6	75.9	0.89	0.78	0.89	35.4
East: Costco Access														
4	L2	1	0.0	1	0.0	0.008	21.6	LOS B	0.0	0.3	0.88	0.57	0.88	24.5
5	T1	1	0.0	1	0.0	0.008	16.0	LOS B	0.0	0.3	0.88	0.57	0.88	32.3
6	R2	16	20.0	16	20.0	* 0.076	36.0	LOS C	0.5	4.1	0.91	0.69	0.91	31.8
Approach		18	17.6	18	17.6	0.076	34.0	LOS C	0.5	4.1	0.90	0.67	0.90	31.6
North: Munibung Road														
7	L2	1	0.0	1	0.0	0.491	25.5	LOS B	8.5	60.8	0.84	0.71	0.84	39.9
8	T1	618	2.6	618	2.6	0.491	20.3	LOS B	8.6	61.6	0.85	0.72	0.85	36.3
9	R2	46	2.3	46	2.3	* 0.296	40.3	LOS C	1.6	11.4	0.97	0.73	0.97	29.0
Approach		665	2.5	665	2.5	0.491	21.7	LOS B	8.6	61.6	0.85	0.72	0.85	35.5
West: Bunnings Access														
10	L2	45	2.3	45	2.3	0.584	38.1	LOS C	4.4	31.4	0.98	0.81	1.02	30.0
11	T1	1	0.0	1	0.0	* 0.584	32.6	LOS C	4.4	31.4	0.98	0.81	1.02	21.9
12	R2	202	3.1	202	3.1	0.584	39.0	LOS C	4.4	31.4	0.99	0.81	1.03	12.1
Approach		248	3.0	248	3.0	0.584	38.9	LOS C	4.4	31.4	0.99	0.81	1.03	16.9
All Vehicles		1297	2.8	1297	2.8	0.596	25.5	LOS B	10.6	75.9	0.89	0.75	0.90	31.9

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

* Critical Movement (Signal Timing)

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: 19502sid-201027 with SMEC upgrade (50 Resi)

Template: Default Site User Report

Site: 101 [TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - 2032 FB+Resi Sat (SMEC) (Site Folder: 2032 Future Base + Resi Sat)]

Network: 27 [2032 FB+Resi Sat (Network Folder: 2032 FB+Resi)]

TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - Scenario 1
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1b	L3	13	0.0	13	0.0	0.540	13.4	LOS A	3.6	26.1	0.88	1.03	1.13	47.0
3a	R1	427	3.2	427	3.2	0.540	23.0	LOS B	3.6	26.1	0.88	1.03	1.13	53.2
12	R2	102	1.0	102	1.0	0.540	19.9	LOS B	3.3	23.7	0.87	1.03	1.14	35.5
12u	U	1	0.0	1	0.0	0.540	22.6	LOS B	3.3	23.7	0.87	1.03	1.14	35.5
Approach		543	2.7	543	2.7	0.540	22.2	LOS B	3.6	26.1	0.88	1.03	1.14	51.3
East: Munibung Road														
1	L2	175	0.6	175	0.6	0.122	3.3	LOS A	0.9	6.5	0.62	0.43	0.62	43.6
4a	L1	306	0.3	306	0.3	0.340	5.5	LOS A	2.6	18.6	0.93	0.58	0.93	53.7
6b	R3	215	0.0	215	0.0	0.340	16.3	LOS B	2.6	18.6	0.90	0.91	0.91	55.8
3u	U	1	0.0	1	0.0	0.340	17.2	LOS B	2.2	15.1	0.89	0.93	0.90	35.3
Approach		697	0.3	697	0.3	0.340	8.3	LOS A	2.6	18.6	0.84	0.64	0.85	53.8
NorthEast: Lake Road														
24b	L3	41	2.6	41	2.6	0.739	9.5	LOS A	11.1	79.8	1.00	1.00	1.31	51.8
24a	L1	432	3.9	432	3.9	0.739	10.2	LOS A	11.1	79.8	1.00	1.00	1.31	51.8
25	T1	836	1.1	836	1.1	0.739	13.8	LOS A	11.1	79.8	1.00	1.07	1.38	55.7
26u	U	1	0.0	1	0.0	0.739	22.4	LOS B	10.1	71.3	1.00	1.11	1.41	58.8
Approach		1309	2.1	1309	2.1	0.739	12.5	LOS A	11.1	79.8	1.00	1.05	1.35	54.5
SouthWest: TC Frith Avenue														
31	T1	1011	0.9	1011	0.9	0.874	22.2	LOS B	13.0	91.5	0.98	1.32	1.87	53.0
32a	R1	376	1.1	376	1.1	0.874	20.4	LOS B	13.0	91.5	0.98	1.30	1.79	40.6
32b	R3	7	0.0	7	0.0	0.874	23.2	LOS B	13.0	91.5	0.98	1.30	1.79	40.6
32u	U	5	0.0	5	0.0	0.874	23.9	LOS B	13.0	91.5	0.98	1.30	1.79	55.0
Approach		1399	1.0	1399	1.0	0.874	21.8	LOS B	13.0	91.5	0.98	1.31	1.85	51.1
All Vehicles		3948	1.5	3948	1.5	0.874	16.4	LOS B	13.0	91.5	0.95	1.07	1.41	52.7

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

Site: 102 [Parrott St/Main Rd/ Fotheringham St - 2032 FB+Resi Sat (SMEC) (Site Folder: 2032 Future Base + Resi Sat)]

Network: 27 [2032 FB+Resi Sat (Network Folder: 2032 FB+Resi)]

Parrott St/Main Rd/ Fotheringham Rd - Scenario 1
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1	L2	16	0.0	16	0.0	0.393	4.4	LOS A	3.0	21.1	0.34	0.46	0.34	33.7
2	T1	460	2.7	460	2.7	0.393	4.7	LOS A	3.0	21.1	0.34	0.46	0.34	37.9
3	R2	65	3.2	65	3.2	0.393	9.3	LOS A	3.0	21.1	0.34	0.46	0.34	52.4
3u	U	1	0.0	1	0.0	0.393	11.3	LOS A	3.0	21.1	0.34	0.46	0.34	42.3
Approach		542	2.7	542	2.7	0.393	5.2	LOS A	3.0	21.1	0.34	0.46	0.34	41.6
East: Fotheringham Road														
4	L2	74	2.9	74	2.9	0.164	7.1	LOS A	1.0	6.8	0.64	0.73	0.64	45.5
5	T1	1	0.0	1	0.0	0.164	7.2	LOS A	1.0	6.8	0.64	0.73	0.64	46.0
6	R2	65	3.2	65	3.2	0.164	12.0	LOS A	1.0	6.8	0.64	0.73	0.64	46.4
6u	U	1	0.0	1	0.0	0.164	14.0	LOS A	1.0	6.8	0.64	0.73	0.64	53.6
Approach		141	3.0	141	3.0	0.164	9.4	LOS A	1.0	6.8	0.64	0.73	0.64	46.0
North: Main Road														
7	L2	74	2.9	74	2.9	0.439	4.5	LOS A	3.3	23.6	0.33	0.45	0.33	52.8
8	T1	521	2.8	521	2.8	0.439	4.7	LOS A	3.3	23.6	0.33	0.45	0.33	48.0
9	R2	18	5.9	18	5.9	0.439	9.4	LOS A	3.3	23.6	0.33	0.45	0.33	34.1
9u	U	1	0.0	1	0.0	0.439	11.4	LOS A	3.3	23.6	0.33	0.45	0.33	46.9
Approach		614	2.9	614	2.9	0.439	4.8	LOS A	3.3	23.6	0.33	0.45	0.33	48.4
West: Parrott Street														
10	L2	16	0.0	16	0.0	0.043	5.2	LOS A	0.2	1.7	0.62	0.67	0.62	22.0
11	T1	1	0.0	1	0.0	0.043	5.7	LOS A	0.2	1.7	0.62	0.67	0.62	49.9
12	R2	18	5.9	18	5.9	0.043	9.9	LOS A	0.2	1.7	0.62	0.67	0.62	36.9
12u	U	1	0.0	1	0.0	0.043	11.9	LOS A	0.2	1.7	0.62	0.67	0.62	13.5
Approach		36	2.9	36	2.9	0.043	7.8	LOS A	0.2	1.7	0.62	0.67	0.62	32.3
All Vehicles		1333	2.8	1333	2.8	0.439	5.5	LOS A	3.3	23.6	0.37	0.49	0.37	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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 103 [Munibung Road/Hague Road - 2032 FB+Resi Sat (SMEC) (Site Folder: 2032 Future Base + Resi Sat)]

Network: 27 [2032 FB+Resi Sat (Network Folder: 2032 FB+Resi)]

Munibung Road/Hague Road - Scenario 1
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
11	T1	520	1.4	520	1.4	0.170	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		520	1.4	520	1.4	0.170	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Hague Road														
21	L2	1	0.0	1	0.0	0.001	6.9	LOS A	0.0	0.0	0.38	0.52	0.38	29.7
Approach		1	0.0	1	0.0	0.001	6.9	LOS A	0.0	0.0	0.38	0.52	0.38	29.7
North: Munibung Road														
24	L2	1	0.0	1	0.0	0.182	5.5	LOS A	0.0	0.0	0.00	0.00	0.00	28.6
5	T1	696	0.5	696	0.5	0.182	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		697	0.5	697	0.5	0.182	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.7
All Vehicles		1218	0.9	1218	0.9	0.182	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.8

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 104 [Munibung Road/Bunnings Access/ Costco Access - 2032 FB+Resi Sat (SMEC) (Site Folder: 2032 Future Base + Resi Sat)]

Network: 27 [2032 FB+Resi Sat (Network Folder: 2032 FB+Resi)]

Munibung Road/Bunnings Access/Costco Access - Scenario 1
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Sequence1
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
1	L2	219	0.0	219	0.0	* 0.820	43.4	LOS D	24.8	174.3	0.98	0.94	1.09	17.4
2	T1	287	1.1	287	1.1	0.820	37.9	LOS C	24.8	174.3	0.98	0.94	1.09	29.2
3	R2	4	100.0	4	100.0	0.065	58.5	LOS E	0.2	2.7	0.97	0.65	0.97	13.9
Approach		511	1.4	511	1.4	0.820	40.4	LOS C	24.8	174.3	0.98	0.94	1.09	24.8
East: Costco Access														
4	L2	1	0.0	1	0.0	0.009	27.1	LOS B	0.1	0.4	0.88	0.58	0.88	20.9
5	T1	1	0.0	1	0.0	0.009	21.6	LOS B	0.1	0.4	0.88	0.58	0.88	28.5
6	R2	9	0.0	9	0.0	* 0.039	47.1	LOS D	0.4	2.9	0.90	0.67	0.90	28.2
Approach		12	0.0	12	0.0	0.039	42.9	LOS D	0.4	2.9	0.90	0.65	0.90	27.9
North: Munibung Road														
7	L2	1	0.0	1	0.0	0.270	30.6	LOS C	6.2	43.9	0.76	0.63	0.76	37.0
8	T1	356	0.6	356	0.6	0.270	25.4	LOS B	6.3	44.4	0.76	0.63	0.76	33.0
9	R2	74	0.0	74	0.0	* 0.661	59.9	LOS E	3.9	27.0	1.00	0.81	1.14	23.5
Approach		431	0.5	431	0.5	0.661	31.3	LOS C	6.3	44.4	0.80	0.66	0.83	30.4
West: Bunnings Access														
10	L2	96	1.1	96	1.1	0.824	49.8	LOS D	11.5	81.1	0.93	0.91	1.18	26.2
11	T1	1	0.0	1	0.0	* 0.824	44.2	LOS D	11.5	81.1	0.93	0.91	1.18	18.3
12	R2	361	0.3	361	0.3	0.824	49.9	LOS D	11.5	81.1	0.93	0.91	1.19	9.9
Approach		458	0.5	458	0.5	0.824	49.9	LOS D	11.5	81.1	0.93	0.91	1.19	14.6
All Vehicles		1411	0.8	1411	0.8	0.824	40.7	LOS C	24.8	174.3	0.91	0.84	1.04	23.2

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: 19502sid-201027 with SMEC upgrade (50 Resi)

Template: Default Site User Report

Site: 101 [TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - 2032 FB+Resi+Dev PM (SMEC) (Site Folder: 2032 Future Base + Resi + Dev PM)]

Network: 25 [2032 FB+Resi+Dev PM (Network Folder: 2032 FB+Resi+Dev)]

TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - Scenario 1
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1b	L3	17	0.0	17	0.0	0.640	23.7	LOS B	4.6	32.8	0.91	1.11	1.36	44.3
3a	R1	399	3.2	399	3.2	0.640	30.0	LOS C	4.6	32.8	0.91	1.11	1.37	50.7
12	R2	124	7.6	124	7.6	0.640	27.2	LOS B	4.0	29.0	0.91	1.11	1.38	30.9
12u	U	1	0.0	1	0.0	0.640	29.3	LOS C	4.0	29.0	0.91	1.11	1.38	30.9
Approach		541	4.1	541	4.1	0.640	29.1	LOS C	4.6	32.8	0.91	1.11	1.37	47.8
East: Munibung Road														
1	L2	286	1.5	286	1.5	0.224	4.0	LOS A	1.9	13.5	0.76	0.51	0.76	42.0
4a	L1	608	4.0	608	4.0	0.737	11.8	LOS A	8.2	59.5	1.00	1.16	1.41	51.3
6b	R3	259	2.0	259	2.0	0.448	17.5	LOS B	3.2	22.9	0.95	1.02	1.06	54.8
3u	U	1	0.0	1	0.0	0.448	18.8	LOS B	3.2	22.9	0.95	1.02	1.06	34.4
Approach		1155	2.9	1155	2.9	0.737	11.2	LOS A	8.2	59.5	0.93	0.97	1.17	51.7
NorthEast: Lake Road														
24b	L3	128	4.1	128	4.1	1.090	110.4	LOS F	83.9	600.4	1.00	3.33	6.34	21.9
24a	L1	589	2.9	589	2.9	1.090	111.3	LOS F	83.9	600.4	1.00	3.33	6.34	21.9
25	T1	973	1.4	973	1.4	1.090	120.3	LOS F	83.9	600.4	1.00	3.09	6.05	27.4
26u	U	1	0.0	1	0.0	1.090	128.1	LOS F	61.7	437.3	1.00	2.99	5.93	32.1
Approach		1692	2.1	1692	2.1	1.090	116.4	LOS F	83.9	600.4	1.00	3.19	6.17	25.3
SouthWest: TC Frith Avenue														
31	T1	1021	3.9	1021	3.9	1.001	54.1	LOS D	32.7	234.0	1.00	2.07	3.90	41.4
32a	R1	471	1.8	471	1.8	1.001	48.5	LOS D	32.7	234.0	1.00	2.11	3.88	26.6
32b	R3	15	7.1	15	7.1	1.001	51.6	LOS D	32.7	234.0	1.00	2.11	3.88	26.6
32u	U	3	0.0	3	0.0	1.001	51.9	LOS D	32.7	234.0	1.00	2.11	3.88	39.5
Approach		1509	3.3	1509	3.3	1.001	52.3	LOS D	32.7	234.0	1.00	2.08	3.89	38.2
All Vehicles		4897	2.9	4897	2.9	1.090	62.2	LOS E	83.9	600.4	0.97	2.10	3.76	33.5

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 102 [Parrott St/Main Rd/ Fotheringham St - 2032 FB+Resi+Dev PM (SMEC) (Site Folder: 2032 Future Base + Resi + Dev PM)]

Network: 25 [2032 FB+Resi+Dev PM (Network Folder: 2032 FB+Resi+Dev)]

Parrott St/Main Rd/ Fotheringham Rd - Scenario 1
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1	L2	22	4.8	22	4.8	0.434	4.2	LOS A	3.4	24.4	0.25	0.44	0.25	34.2
2	T1	528	4.2	528	4.2	0.434	4.4	LOS A	3.4	24.4	0.25	0.44	0.25	38.8
3	R2	91	4.7	91	4.7	0.434	9.1	LOS A	3.4	24.4	0.25	0.44	0.25	52.8
3u	U	1	0.0	1	0.0	0.434	11.1	LOS A	3.4	24.4	0.25	0.44	0.25	42.9
Approach		642	4.3	642	4.3	0.434	5.1	LOS A	3.4	24.4	0.25	0.44	0.25	42.9
East: Fotheringham Road														
4	L2	17	0.0	17	0.0	0.038	7.7	LOS A	0.2	1.6	0.70	0.68	0.70	45.3
5	T1	1	0.0	1	0.0	0.038	7.9	LOS A	0.2	1.6	0.70	0.68	0.70	36.4
6	R2	9	0.0	9	0.0	0.038	12.5	LOS A	0.2	1.6	0.70	0.68	0.70	46.1
6u	U	1	0.0	1	0.0	0.038	14.6	LOS B	0.2	1.6	0.70	0.68	0.70	53.4
Approach		28	0.0	28	0.0	0.038	9.6	LOS A	0.2	1.6	0.70	0.68	0.70	45.6
North: Main Road														
7	L2	160	2.6	151	2.6	0.603	4.7	LOS A	5.7	40.6	0.44	0.48	0.44	52.3
8	T1	693	2.6	655	2.6	0.603	5.0	LOS A	5.7	40.6	0.44	0.48	0.44	47.2
9	R2	39	2.7	37	2.7	0.603	9.6	LOS A	5.7	40.6	0.44	0.48	0.44	33.6
9u	U	1	0.0	1	0.0	0.603	11.6	LOS A	5.7	40.6	0.44	0.48	0.44	45.8
Approach		893	2.6	844 N1	2.6	0.603	5.1	LOS A	5.7	40.6	0.44	0.48	0.44	47.9
West: Parrott Street														
10	L2	2	0.0	2	0.0	0.010	5.3	LOS A	0.1	0.4	0.62	0.63	0.62	22.0
11	T1	1	0.0	1	0.0	0.010	5.8	LOS A	0.1	0.4	0.62	0.63	0.62	49.1
12	R2	4	0.0	4	0.0	0.010	9.9	LOS A	0.1	0.4	0.62	0.63	0.62	36.1
12u	U	1	0.0	1	0.0	0.010	12.0	LOS A	0.1	0.4	0.62	0.63	0.62	13.8
Approach		8	0.0	8	0.0	0.010	8.5	LOS A	0.1	0.4	0.62	0.63	0.62	33.3
All Vehicles		1572	3.2	1523 N1	3.3	0.603	5.2	LOS A	5.7	40.6	0.36	0.47	0.36	46.4

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

Site: 103 [Munibung Road/Hague Road - 2032 FB+Resi+Dev PM (SMEC) (Site Folder: 2032 Future Base + Resi + Dev PM)]

Network: 25 [2032 FB+Resi+Dev PM (Network Folder: 2032 FB+Resi+Dev)]

Munibung Road/Hague Road - Scenario 1
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
11	T1	726	3.5	715	3.5	0.194	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		726	3.5	715[N1]	3.5	0.194	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Hague Road														
21	L2	323	3.3	323	3.3	0.349	8.2	LOS A	2.0	14.2	0.53	0.70	0.54	27.6
Approach		323	3.3	323	3.3	0.349	8.2	LOS A	2.0	14.2	0.53	0.70	0.54	27.6
North: Munibung Road														
24	L2	32	3.3	32	3.3	0.226	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	28.1
5	T1	819	2.7	819	2.7	0.226	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	58.4
Approach		851	2.7	851	2.7	0.226	0.2	NA	0.0	0.0	0.00	0.02	0.00	54.7
All Vehicles		1900	3.1	1889[N1]	3.1	0.349	1.5	NA	2.0	14.2	0.09	0.13	0.09	50.9

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

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

Site: 104 [Munibung Road/Bunnings Access/ Costco Access - 2032 FB+Resi+Dev PM (SMEC) (Site Folder: 2032 Future Base + Resi + Dev PM)]

Network: 25 [2032 FB+Resi+Dev PM (Network Folder: 2032 FB+Resi+Dev)]

Munibung Road/Bunnings Access/Costco Access - Scenario 1
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Sequence1
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
1	L2	80	6.6	79	6.6	* 0.853	45.2	LOS D	16.4	117.9	1.00	1.02	1.27	17.1
2	T1	300	2.5	295	2.5	0.853	39.6	LOS C	16.4	117.9	1.00	1.02	1.27	29.0
3	R2	344	3.1	339	3.1	* 0.829	43.9	LOS D	14.4	103.6	1.00	0.95	1.23	18.3
Approach		724	3.2	713 N1	3.2	0.853	42.3	LOS C	16.4	117.9	1.00	0.99	1.25	23.1
East: Costco Access														
4	L2	34	3.1	34	3.1	0.155	23.7	LOS B	1.1	8.0	0.88	0.70	0.88	22.2
5	T1	14	0.0	14	0.0	0.155	18.1	LOS B	1.1	8.0	0.88	0.70	0.88	30.0
6	R2	91	5.8	91	5.8	* 0.406	42.2	LOS C	3.4	25.2	0.96	0.77	0.96	29.7
Approach		138	4.6	138	4.6	0.406	35.3	LOS C	3.4	25.2	0.94	0.75	0.94	28.8
North: Munibung Road														
7	L2	69	3.0	69	3.0	0.767	39.0	LOS C	13.7	98.0	0.99	0.92	1.11	32.4
8	T1	626	2.7	626	2.7	0.767	33.7	LOS C	13.8	98.7	0.99	0.92	1.11	28.5
9	R2	46	2.3	46	2.3	0.113	32.4	LOS C	1.5	10.4	0.83	0.73	0.83	32.1
Approach		742	2.7	742	2.7	0.767	34.2	LOS C	13.8	98.7	0.98	0.91	1.09	29.2
West: Bunnings Access														
10	L2	43	2.4	43	2.4	0.592	42.9	LOS D	5.0	35.5	0.99	0.81	1.02	28.5
11	T1	14	0.0	14	0.0	* 0.592	37.3	LOS C	5.0	35.5	0.99	0.81	1.02	20.5
12	R2	191	3.3	191	3.3	0.592	43.8	LOS D	5.0	35.5	0.99	0.81	1.03	11.0
Approach		247	3.0	247	3.0	0.592	43.3	LOS D	5.0	35.5	0.99	0.81	1.03	15.9
All Vehicles		1852	3.1	1840 N1	3.1	0.853	38.6	LOS C	16.4	117.9	0.99	0.91	1.13	25.2

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: 19502sid-201027 with SMEC upgrade (50 Resi)

Template: Default Site User Report

Site: 101 [TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - 2032 FB+Resi+Dev Sat (SMEC) (Site Folder: 2032 Future Base + Resi + Dev Sat)]

Network: 24 [2032 FB+Resi+Dev Sat (Network Folder: 2032 FB+Resi+Dev)]

TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - Scenario 1
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1b	L3	13	0.0	13	0.0	0.810	28.4	LOS B	7.8	56.3	0.96	1.29	1.90	40.0
3a	R1	427	3.2	427	3.2	0.810	35.7	LOS C	7.8	56.3	0.96	1.29	1.90	47.2
12	R2	255	2.5	255	2.5	0.810	36.6	LOS C	6.7	48.1	0.95	1.27	1.90	26.4
12u	U	1	0.0	1	0.0	0.810	39.2	LOS C	6.7	48.1	0.95	1.27	1.90	26.4
Approach		696	2.9	696	2.9	0.810	35.9	LOS C	7.8	56.3	0.96	1.28	1.90	41.8
East: Munibung Road														
1	L2	328	1.9	328	1.9	0.222	3.3	LOS A	1.8	12.5	0.62	0.42	0.62	43.6
4a	L1	577	1.6	577	1.6	0.580	6.4	LOS A	5.3	37.8	0.95	0.74	1.10	53.6
6b	R3	403	1.3	403	1.3	0.580	17.7	LOS B	5.3	37.8	0.93	1.03	1.13	55.1
3u	U	1	0.0	1	0.0	0.580	18.7	LOS B	4.5	31.8	0.93	1.05	1.13	34.5
Approach		1309	1.6	1309	1.6	0.580	9.1	LOS A	5.3	37.8	0.86	0.75	0.99	53.4
NorthEast: Lake Road														
24b	L3	231	3.2	231	3.2	1.105	129.5	LOS F	84.8	608.8	1.00	3.58	7.02	19.6
24a	L1	432	3.9	432	3.9	1.105	130.6	LOS F	84.8	608.8	1.00	3.58	7.02	19.6
25	T1	836	1.1	836	1.1	1.105	139.1	LOS F	84.8	608.8	1.00	3.21	6.55	25.0
26u	U	1	0.0	1	0.0	1.105	148.1	LOS F	58.5	413.8	1.00	3.06	6.35	29.5
Approach		1499	2.2	1499	2.2	1.105	135.2	LOS F	84.8	608.8	1.00	3.37	6.75	22.8
SouthWest: TC Frith Avenue														
31	T1	1011	0.9	1011	0.9	1.292	284.7	LOS F	151.4	1074.4	1.00	5.78	14.91	15.4
32a	R1	645	2.0	645	2.0	1.292	282.9	LOS F	151.4	1074.4	1.00	6.55	16.38	6.9
32b	R3	7	0.0	7	0.0	1.292	285.7	LOS F	151.4	1074.4	1.00	6.55	16.38	6.9
32u	U	5	0.0	5	0.0	1.292	286.5	LOS F	151.4	1074.4	1.00	6.55	16.38	11.9
Approach		1668	1.3	1668	1.3	1.292	284.0	LOS F	151.4	1074.4	1.00	6.08	15.49	12.4
All Vehicles		5173	1.9	5172 N1	1.9	1.292	137.9	LOS F	151.4	1074.4	0.96	3.30	7.46	20.3

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

Site: 102 [Parrott St/Main Rd/ Fotheringham St - 2032 FB+Resi+Dev Sat (SMEC) (Site Folder: 2032 Future Base + Resi + Dev Sat)]

Network: 24 [2032 FB+Resi+Dev Sat (Network Folder: 2032 FB+Resi+Dev)]

Parrott St/Main Rd/ Fotheringham Rd - Scenario 1
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1	L2	16	0.0	16	0.0	0.496	4.5	LOS A	4.3	31.2	0.38	0.46	0.38	33.4
2	T1	613	2.7	613	2.7	0.496	4.7	LOS A	4.3	31.2	0.38	0.46	0.38	37.5
3	R2	65	3.2	65	3.2	0.496	9.4	LOS A	4.3	31.2	0.38	0.46	0.38	52.2
3u	U	1	0.0	1	0.0	0.496	11.4	LOS A	4.3	31.2	0.38	0.46	0.38	42.0
Approach		695	2.7	695	2.7	0.496	5.2	LOS A	4.3	31.2	0.38	0.46	0.38	40.5
East: Fotheringham Road														
4	L2	74	2.9	74	2.9	0.180	8.0	LOS A	1.1	7.9	0.71	0.77	0.71	44.8
5	T1	1	0.0	1	0.0	0.180	8.1	LOS A	1.1	7.9	0.71	0.77	0.71	45.1
6	R2	65	3.2	65	3.2	0.180	12.8	LOS A	1.1	7.9	0.71	0.77	0.71	45.4
6u	U	1	0.0	1	0.0	0.180	14.8	LOS B	1.1	7.9	0.71	0.77	0.71	52.9
Approach		141	3.0	141	3.0	0.180	10.3	LOS A	1.1	7.9	0.71	0.77	0.71	45.2
North: Main Road														
7	L2	74	2.9	68	2.8	0.504	4.5	LOS A	4.2	29.8	0.36	0.45	0.36	52.6
8	T1	675	3.0	623	2.9	0.504	4.8	LOS A	4.2	29.8	0.36	0.45	0.36	47.8
9	R2	18	5.9	17	5.8	0.504	9.4	LOS A	4.2	29.8	0.36	0.45	0.36	34.0
9u	U	1	0.0	1	0.0	0.504	11.4	LOS A	4.2	29.8	0.36	0.45	0.36	46.6
Approach		767	3.0	708 N1	3.0	0.504	4.8	LOS A	4.2	29.8	0.36	0.45	0.36	48.1
West: Parrott Street														
10	L2	16	0.0	16	0.0	0.049	6.5	LOS A	0.3	2.1	0.71	0.72	0.71	20.0
11	T1	1	0.0	1	0.0	0.049	6.9	LOS A	0.3	2.1	0.71	0.72	0.71	48.4
12	R2	18	5.9	18	5.9	0.049	11.2	LOS A	0.3	2.1	0.71	0.72	0.71	34.9
12u	U	1	0.0	1	0.0	0.049	13.1	LOS A	0.3	2.1	0.71	0.72	0.71	12.9
Approach		36	2.9	36	2.9	0.049	9.1	LOS A	0.3	2.1	0.71	0.72	0.71	30.2
All Vehicles		1639	2.9	1580 N1	3.0	0.504	5.6	LOS A	4.3	31.2	0.41	0.49	0.41	45.3

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

Site: 103 [Munibung Road/Hague Road - 2032 FB+Resi+Dev Sat (SMEC) (Site Folder: 2032 Future Base + Resi + Dev Sat)]

Network: 24 [2032 FB+Resi+Dev Sat (Network Folder: 2032 FB+Resi+Dev)]

Munibung Road/Hague Road - Scenario 1
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
11	T1	1131	2.2	948	2.3	0.250	0.0	LOS A	25.6	182.9	0.00	0.00	0.00	59.9
Approach		1131	2.2	948 N1	2.3	0.250	0.0	NA	25.6	182.9	0.00	0.00	0.00	59.9
East: Hague Road														
21	L2	533	3.2	533	3.2	0.560	10.0	LOS A	5.8	41.8	0.62	0.82	0.87	24.6
Approach		533	3.2	533	3.2	0.560	10.0	LOS A	5.8	41.8	0.62	0.82	0.87	24.6
North: Munibung Road														
24	L2	16	0.0	16	0.0	0.202	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	28.4
5	T1	757	0.6	757	0.6	0.202	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.1
Approach		773	0.5	773	0.5	0.202	0.1	NA	0.0	0.0	0.00	0.01	0.00	56.9
All Vehicles		2436	1.9	2253 N1	2.1	0.560	2.4	NA	25.6	182.9	0.15	0.20	0.21	47.9

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

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

Site: 104 [Munibung Road/Bunnings Access/ Costco Access - 2032 FB+Resi+Dev Sat (SMEC) (Site Folder: 2032 Future Base + Resi + Dev Sat)]

Network: 24 [2032 FB+Resi+Dev Sat (Network Folder: 2032 FB+Resi+Dev)]

Munibung Road/Bunnings Access/Costco Access - Scenario 1
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Sequence1
Reference Phase: Phase A
Input Phase Sequence: A, B, C, D
Output Phase Sequence: A, B, C, D

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
1	L2	219	0.0	183	0.0	1.009	117.2	LOS F	27.8	195.8	1.00	1.23	1.56	7.7
2	T1	297	1.1	249	1.1	* 1.009	111.7	LOS F	27.8	195.8	1.00	1.23	1.56	15.0
3	R2	615	3.6	515	3.6	* 1.022	122.3	LOS F	27.1	195.8	1.00	1.12	1.58	8.3
Approach		1131	2.2	947 N1	2.3	1.022	118.5	LOS F	27.8	195.8	1.00	1.17	1.57	10.0
East: Costco Access														
4	L2	59	3.6	59	3.6	0.377	40.6	LOS C	3.7	26.2	0.96	0.76	0.96	15.0
5	T1	26	0.0	26	0.0	0.377	35.0	LOS C	3.7	26.2	0.96	0.76	0.96	21.7
6	R2	166	3.2	166	3.2	* 0.855	81.2	LOS F	12.4	89.1	1.00	0.93	1.27	20.6
Approach		252	2.9	252	2.9	0.855	66.8	LOS E	12.4	89.1	0.99	0.87	1.17	20.0
North: Munibung Road														
7	L2	145	2.9	145	2.9	0.574	55.2	LOS D	15.4	109.8	0.93	0.81	0.93	26.4
8	T1	372	0.6	372	0.6	0.574	50.5	LOS D	15.6	110.0	0.94	0.80	0.94	22.6
9	R2	74	0.0	74	0.0	0.142	45.9	LOS D	3.7	26.2	0.79	0.75	0.79	27.2
Approach		591	1.1	591	1.1	0.574	51.1	LOS D	15.6	110.0	0.92	0.79	0.92	24.2
West: Bunnings Access														
10	L2	91	1.2	91	1.2	1.000	122.1	LOS F	23.4	164.5	1.00	1.13	1.67	14.7
11	T1	26	0.0	26	0.0	* 1.000	116.6	LOS F	23.4	164.5	1.00	1.13	1.67	9.2
12	R2	340	0.3	340	0.3	1.000	122.4	LOS F	23.4	164.5	1.00	1.10	1.67	4.5
Approach		457	0.5	457	0.5	1.000	122.0	LOS F	23.4	164.5	1.00	1.11	1.67	7.1
All Vehicles		2429	1.7	2246 N1	1.8	1.022	95.7	LOS F	27.8	195.8	0.98	1.03	1.37	12.9

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

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: 19502sid-201103 with SMEC upgrade (100 Resi)

Template: Default Site User Report

Site: 101 [TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - 2032 FB+Resi PM (Site Folder: 2032 Future Base + Resi PM)]

Network: 24 [2032 FB+Resi PM (Network Folder: 2032 FB+Resi)]

PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1b	L3	17	0.0	17	0.0	0.555	19.4	LOS B	3.8	27.6	0.92	1.06	1.22	45.5
3a	R1	407	3.1	407	3.1	0.555	24.9	LOS B	3.8	27.6	0.91	1.06	1.22	51.6
12	R2	40	18.4	40	18.4	0.555	25.1	LOS B	3.4	24.9	0.89	1.06	1.22	32.7
12u	U	1	0.0	1	0.0	0.555	26.3	LOS B	3.4	24.9	0.89	1.06	1.22	32.7
Approach		465	4.3	465	4.3	0.555	24.7	LOS B	3.8	27.6	0.91	1.06	1.22	50.5
East: Munibung Road														
1	L2	239	0.4	239	0.4	0.223	5.0	LOS A	2.1	14.7	0.90	0.65	0.90	40.5
4a	L1	428	4.2	428	4.2	0.607	11.7	LOS A	6.1	44.3	1.00	1.10	1.26	51.4
6b	R3	181	1.7	181	1.7	0.358	18.0	LOS B	2.5	18.0	0.98	1.00	1.01	54.5
3u	U	1	0.0	1	0.0	0.358	19.4	LOS B	2.5	18.0	0.98	1.00	1.01	33.9
Approach		849	2.6	849	2.6	0.607	11.2	LOS A	6.1	44.3	0.97	0.95	1.10	51.3
NorthEast: Lake Road														
24b	L3	52	6.1	52	6.1	0.859	11.8	LOS A	18.9	134.7	1.00	1.03	1.44	50.3
24a	L1	707	2.4	707	2.4	0.859	12.3	LOS A	18.9	134.7	1.00	1.03	1.44	50.3
25	T1	973	1.4	973	1.4	0.859	17.7	LOS B	18.9	134.7	1.00	1.12	1.56	53.9
26u	U	1	0.0	1	0.0	0.859	25.7	LOS B	17.8	126.1	1.00	1.15	1.60	57.4
Approach		1733	1.9	1733	1.9	0.859	15.3	LOS B	18.9	134.7	1.00	1.08	1.50	52.6
SouthWest: TC Frith Avenue														
31	T1	1021	3.9	1021	3.9	0.798	16.4	LOS B	9.7	69.3	0.93	1.15	1.43	55.6
32a	R1	292	1.1	292	1.1	0.798	16.1	LOS B	9.7	69.3	0.93	1.14	1.37	44.3
32b	R3	18	5.9	18	5.9	0.798	19.1	LOS B	9.7	69.3	0.93	1.14	1.37	44.3
32u	U	3	0.0	3	0.0	0.798	19.7	LOS B	9.7	69.3	0.93	1.14	1.37	58.7
Approach		1334	3.3	1334	3.3	0.798	16.4	LOS B	9.7	69.3	0.93	1.14	1.41	54.2
All Vehicles		4381	2.7	4381	2.7	0.859	15.8	LOS B	18.9	134.7	0.96	1.07	1.37	52.7

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

Site: 102 [Parrott St/Main Rd/ Fotheringham St - 2032 FB+Resi PM (Site Folder: 2032 Future Base + Resi PM)]

Network: 24 [2032 FB+Resi PM (Network Folder: 2032 FB+Resi)]

PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1	L2	22	4.8	22	4.8	0.446	4.3	LOS A	3.6	26.4	0.30	0.48	0.30	33.3
2	T1	441	4.3	441	4.3	0.446	4.5	LOS A	3.6	26.4	0.30	0.48	0.30	37.2
3	R2	181	2.3	181	2.3	0.446	9.1	LOS A	3.6	26.4	0.30	0.48	0.30	52.1
3u	U	1	0.0	1	0.0	0.446	11.2	LOS A	3.6	26.4	0.30	0.48	0.30	41.8
Approach		645	3.8	645	3.8	0.446	5.8	LOS A	3.6	26.4	0.30	0.48	0.30	44.5
East: Fotheringham Road														
4	L2	34	0.0	34	0.0	0.074	7.4	LOS A	0.5	3.3	0.73	0.72	0.73	45.6
5	T1	1	0.0	1	0.0	0.074	7.6	LOS A	0.5	3.3	0.73	0.72	0.73	36.6
6	R2	19	0.0	19	0.0	0.074	12.3	LOS A	0.5	3.3	0.73	0.72	0.73	46.5
6u	U	1	0.0	1	0.0	0.074	14.4	LOS A	0.5	3.3	0.73	0.72	0.73	53.7
Approach		55	0.0	55	0.0	0.074	9.2	LOS A	0.5	3.3	0.73	0.72	0.73	45.9
North: Main Road														
7	L2	320	1.3	320	1.3	0.763	6.7	LOS A	9.9	70.2	0.76	0.65	0.80	51.0
8	T1	605	2.4	605	2.4	0.763	7.0	LOS A	9.9	70.2	0.76	0.65	0.80	45.4
9	R2	39	2.7	39	2.7	0.763	11.6	LOS A	9.9	70.2	0.76	0.65	0.80	32.3
9u	U	1	0.0	1	0.0	0.763	13.6	LOS A	9.9	70.2	0.76	0.65	0.80	43.4
Approach		965	2.1	965	2.1	0.763	7.1	LOS A	9.9	70.2	0.76	0.65	0.80	47.3
West: Parrott Street														
10	L2	2	0.0	2	0.0	0.010	5.4	LOS A	0.1	0.4	0.64	0.63	0.64	21.9
11	T1	1	0.0	1	0.0	0.010	5.9	LOS A	0.1	0.4	0.64	0.63	0.64	49.0
12	R2	4	0.0	4	0.0	0.010	10.0	LOS A	0.1	0.4	0.64	0.63	0.64	36.0
12u	U	1	0.0	1	0.0	0.010	12.1	LOS A	0.1	0.4	0.64	0.63	0.64	13.8
Approach		8	0.0	8	0.0	0.010	8.6	LOS A	0.1	0.4	0.64	0.63	0.64	33.2
All Vehicles		1674	2.6	1674	2.6	0.763	6.7	LOS A	9.9	70.2	0.58	0.59	0.60	46.5

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 103 [Munibung Road/Hague Road - 2032 FB+Resi PM (Site Folder: 2032 Future Base + Resi PM)]

Network: 24 [2032 FB+Resi PM (Network Folder: 2032 FB+Resi)]

PM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
11	T1	381	3.3	381	3.3	0.110	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		381	3.3	381	3.3	0.110	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Hague Road														
21	L2	24	4.3	24	4.3	0.027	7.4	LOS A	0.1	0.8	0.42	0.60	0.42	29.1
Approach		24	4.3	24	4.3	0.027	7.4	LOS A	0.1	0.8	0.42	0.60	0.42	29.1
North: Munibung Road														
24	L2	24	4.3	24	4.3	0.225	5.6	LOS A	0.0	0.0	0.00	0.03	0.00	28.1
5	T1	824	2.6	824	2.6	0.225	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	58.8
Approach		848	2.6	848	2.6	0.225	0.2	NA	0.0	0.0	0.00	0.02	0.00	55.8
All Vehicles		1254	2.9	1254	2.9	0.225	0.3	NA	0.1	0.8	0.01	0.02	0.01	56.7

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

Site: 104 [Munibung Road/Bunnings Access/ Costco Access - 2032 FB+Resi PM (Site Folder: 2032 Future Base + Resi PM)]

Network: 24 [2032 FB+Resi PM (Network Folder: 2032 FB+Resi)]

PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Sequence1
Reference Phase: Phase A
Input Phase Sequence: A, D, E, F, F1*, F2*
Output Phase Sequence: A, D, E, F
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
1	L2	80	6.6	80	6.6	* 0.847	53.3	LOS D	18.9	134.9	1.00	1.02	1.21	15.1
2	T1	285	1.5	285	1.5	* 0.847	47.6	LOS D	18.9	134.9	1.00	1.02	1.21	26.3
3	R2	1	0.0	1	0.0	0.005	31.7	LOS C	0.0	0.2	0.89	0.59	0.89	22.6
Approach		366	2.6	366	2.6	0.847	48.8	LOS D	18.9	134.9	1.00	1.02	1.21	24.3
East: Costco Access														
4	L2	1	0.0	1	0.0	0.009	27.1	LOS B	0.1	0.4	0.88	0.57	0.88	20.9
5	T1	1	0.0	1	0.0	0.009	21.5	LOS B	0.1	0.4	0.88	0.57	0.88	28.5
6	R2	16	20.0	16	20.0	* 0.075	48.0	LOS D	0.7	5.7	0.91	0.69	0.91	27.7
Approach		18	17.6	18	17.6	0.075	45.2	LOS D	0.7	5.7	0.90	0.68	0.90	27.6
North: Munibung Road														
7	L2	1	0.0	1	0.0	0.750	46.0	LOS D	15.8	112.8	0.99	0.89	1.06	30.3
8	T1	658	2.4	658	2.4	0.750	40.7	LOS C	15.8	112.8	0.99	0.89	1.06	25.9
9	R2	46	2.3	46	2.3	* 0.229	34.1	LOS C	1.6	11.6	0.95	0.73	0.95	31.4
Approach		705	2.4	705	2.4	0.750	40.3	LOS C	15.8	112.8	0.98	0.88	1.05	26.3
West: Bunnings Access														
10	L2	45	2.3	45	2.3	0.201	30.0	LOS C	4.2	30.3	0.74	0.75	0.74	33.4
11	T1	1	0.0	1	0.0	0.201	24.4	LOS B	4.2	30.3	0.74	0.75	0.74	25.3
12	R2	202	3.1	202	3.1	0.201	30.4	LOS C	4.3	30.8	0.74	0.75	0.74	14.7
Approach		248	3.0	248	3.0	0.201	30.3	LOS C	4.3	30.8	0.74	0.75	0.74	20.0
All Vehicles		1338	2.8	1338	2.8	0.847	40.8	LOS C	18.9	134.9	0.94	0.89	1.04	24.9

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

* Critical Movement (Signal Timing)

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: 19502sid-201103 with SMEC upgrade (100 Resi)

Template: Default Site User Report

Site: 101 [TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - 2032 FB+Resi Sat (Site Folder: 2032 Future Base + Resi Sat)]

Network: 25 [2032 FB+Resi Sat (Network Folder: 2032 FB+Resi)]

Saturday Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1b	L3	14	0.0	14	0.0	0.581	13.1	LOS A	4.2	30.1	0.90	1.05	1.18	46.8
3a	R1	479	2.9	479	2.9	0.581	25.7	LOS B	4.2	30.1	0.89	1.05	1.18	53.1
12	R2	115	0.9	115	0.9	0.581	20.0	LOS B	3.9	27.5	0.89	1.05	1.19	35.4
12u	U	1	0.0	1	0.0	0.581	22.8	LOS B	3.9	27.5	0.89	1.05	1.19	35.4
Approach		608	2.4	608	2.4	0.581	24.3	LOS B	4.2	30.1	0.89	1.05	1.18	51.1
East: Munibung Road														
1	L2	196	0.5	196	0.5	0.143	3.5	LOS A	1.1	8.0	0.68	0.46	0.68	42.9
4a	L1	201	0.5	201	0.5	0.281	5.7	LOS A	2.2	15.3	0.93	0.65	0.93	52.9
6b	R3	215	0.0	215	0.0	0.281	18.9	LOS B	2.2	15.3	0.90	0.86	0.90	56.4
3u	U	1	0.0	1	0.0	0.281	17.4	LOS B	1.8	12.4	0.89	0.94	0.89	35.3
Approach		613	0.3	613	0.3	0.281	9.6	LOS A	2.2	15.3	0.84	0.67	0.84	53.6
NorthEast: Lake Road														
24b	L3	41	2.6	41	2.6	0.778	11.0	LOS A	13.0	93.0	1.00	1.06	1.41	50.7
24a	L1	483	3.5	483	3.5	0.778	11.8	LOS A	13.0	93.0	1.00	1.06	1.41	50.7
25	T1	836	1.1	836	1.1	0.778	15.6	LOS B	13.0	93.0	1.00	1.13	1.49	54.6
26u	U	1	0.0	1	0.0	0.778	24.5	LOS B	11.7	82.4	1.00	1.17	1.52	57.9
Approach		1361	2.0	1361	2.0	0.778	14.1	LOS A	13.0	93.0	1.00	1.10	1.46	53.4
SouthWest: TC Frith Avenue														
31	T1	1011	0.9	1011	0.9	0.911	28.2	LOS B	15.1	106.9	1.00	1.43	2.19	51.2
32a	R1	376	1.1	376	1.1	0.911	23.7	LOS B	15.1	106.9	1.00	1.42	2.11	38.2
32b	R3	8	0.0	8	0.0	0.911	26.5	LOS B	15.1	106.9	1.00	1.42	2.11	38.2
32u	U	5	0.0	5	0.0	0.911	27.2	LOS B	15.1	106.9	1.00	1.42	2.11	52.6
Approach		1400	1.0	1400	1.0	0.911	27.0	LOS B	15.1	106.9	1.00	1.43	2.17	49.1
All Vehicles		3982	1.5	3982	1.5	0.911	19.5	LOS B	15.1	106.9	0.96	1.14	1.57	51.4

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 102 [Parrott St/Main Rd/ Fotheringham St - 2032 FB+Resi Sat (Site Folder: 2032 Future Base + Resi Sat)]

Network: 25 [2032 FB+Resi Sat (Network Folder: 2032 FB+Resi)]

Saturday Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1	L2	16	0.0	16	0.0	0.480	4.9	LOS A	4.0	28.3	0.50	0.55	0.50	32.2
2	T1	460	2.7	460	2.7	0.480	5.2	LOS A	4.0	28.3	0.50	0.55	0.50	35.6
3	R2	131	1.6	131	1.6	0.480	9.8	LOS A	4.0	28.3	0.50	0.55	0.50	51.2
3u	U	1	0.0	1	0.0	0.480	11.8	LOS A	4.0	28.3	0.50	0.55	0.50	40.6
Approach		607	2.4	607	2.4	0.480	6.2	LOS A	4.0	28.3	0.50	0.55	0.50	41.9
East: Fotheringham Road														
4	L2	147	1.4	147	1.4	0.331	7.5	LOS A	2.2	15.6	0.73	0.79	0.73	45.2
5	T1	1	0.0	1	0.0	0.331	7.7	LOS A	2.2	15.6	0.73	0.79	0.73	45.6
6	R2	131	1.6	131	1.6	0.331	12.4	LOS A	2.2	15.6	0.73	0.79	0.73	45.9
6u	U	1	0.0	1	0.0	0.331	14.4	LOS A	2.2	15.6	0.73	0.79	0.73	53.3
Approach		280	1.5	280	1.5	0.331	9.8	LOS A	2.2	15.6	0.73	0.79	0.73	45.5
North: Main Road														
7	L2	147	1.4	147	1.4	0.535	5.0	LOS A	4.6	32.6	0.51	0.52	0.51	52.0
8	T1	521	2.8	521	2.8	0.535	5.3	LOS A	4.6	32.6	0.51	0.52	0.51	46.9
9	R2	18	5.9	18	5.9	0.535	10.0	LOS A	4.6	32.6	0.51	0.52	0.51	33.3
9u	U	1	0.0	1	0.0	0.535	11.9	LOS A	4.6	32.6	0.51	0.52	0.51	45.4
Approach		687	2.6	687	2.6	0.535	5.4	LOS A	4.6	32.6	0.51	0.52	0.51	48.0
West: Parrott Street														
10	L2	16	0.0	16	0.0	0.049	6.2	LOS A	0.3	2.1	0.71	0.71	0.71	20.3
11	T1	1	0.0	1	0.0	0.049	6.7	LOS A	0.3	2.1	0.71	0.71	0.71	48.7
12	R2	18	5.9	18	5.9	0.049	11.0	LOS A	0.3	2.1	0.71	0.71	0.71	35.2
12u	U	1	0.0	1	0.0	0.049	12.9	LOS A	0.3	2.1	0.71	0.71	0.71	13.0
Approach		36	2.9	36	2.9	0.049	8.8	LOS A	0.3	2.1	0.71	0.71	0.71	30.5
All Vehicles		1611	2.4	1611	2.4	0.535	6.5	LOS A	4.6	32.6	0.55	0.58	0.55	45.7

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 103 [Munibung Road/Hague Road - 2032 FB+Resi Sat (Site Folder: 2032 Future Base + Resi Sat)]

Network: 25 [2032 FB+Resi Sat (Network Folder: 2032 FB+Resi)]

Saturday Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
11	T1	533	1.4	533	1.4	0.164	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		533	1.4	533	1.4	0.164	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Hague Road														
21	L2	1	0.0	1	0.0	0.001	6.9	LOS A	0.0	0.0	0.39	0.52	0.39	29.6
Approach		1	0.0	1	0.0	0.001	6.9	LOS A	0.0	0.0	0.39	0.52	0.39	29.6
North: Munibung Road														
24	L2	1	0.0	1	0.0	0.188	5.5	LOS A	0.0	0.0	0.00	0.00	0.00	28.6
5	T1	717	0.4	717	0.4	0.188	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		718	0.4	718	0.4	0.188	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.7
All Vehicles		1252	0.8	1252	0.8	0.188	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.8

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 104 [Munibung Road/Bunnings Access/ Costco Access - 2032 FB+Resi Sat (Site Folder: 2032 Future Base + Resi Sat)]

Network: 25 [2032 FB+Resi Sat (Network Folder: 2032 FB+Resi)]

Saturday Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 90 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Sequence1
Reference Phase: Phase A
Input Phase Sequence: A, D, E, F, F1*, F2*
Output Phase Sequence: A, D, E, F
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
1	L2	219	0.0	219	0.0	* 0.831	40.2	LOS C	22.3	157.2	0.99	1.00	1.13	18.4
2	T1	300	1.1	300	1.1	* 0.831	34.6	LOS C	22.3	157.2	0.99	1.00	1.13	30.5
3	R2	4	0.0	4	0.0	0.010	21.4	LOS B	0.1	0.7	0.70	0.62	0.70	27.9
Approach		523	0.6	523	0.6	0.831	36.9	LOS C	22.3	157.2	0.98	1.00	1.13	26.2
East: Costco Access														
4	L2	1	0.0	1	0.0	0.008	24.8	LOS B	0.0	0.3	0.87	0.57	0.87	22.2
5	T1	1	0.0	1	0.0	0.008	19.2	LOS B	0.0	0.3	0.87	0.57	0.87	30.0
6	R2	9	0.0	9	0.0	* 0.038	42.8	LOS D	0.4	2.6	0.90	0.67	0.90	29.6
Approach		12	0.0	12	0.0	0.038	39.0	LOS C	0.4	2.6	0.89	0.65	0.89	29.4
North: Munibung Road														
7	L2	1	0.0	1	0.0	0.302	29.6	LOS C	6.2	43.4	0.78	0.65	0.78	37.5
8	T1	377	0.6	377	0.6	0.302	24.4	LOS B	6.3	44.0	0.79	0.65	0.79	33.6
9	R2	74	0.0	74	0.0	* 0.298	26.7	LOS B	2.0	13.9	0.92	0.75	0.92	34.9
Approach		452	0.5	452	0.5	0.302	24.8	LOS B	6.3	44.0	0.81	0.67	0.81	33.8
West: Bunnings Access														
10	L2	96	1.1	96	1.1	0.859	50.3	LOS D	11.5	80.7	0.95	0.96	1.31	26.0
11	T1	1	0.0	1	0.0	0.859	44.7	LOS D	11.5	80.7	0.95	0.96	1.31	18.2
12	R2	361	0.3	361	0.3	0.859	50.7	LOS D	11.5	80.7	0.94	0.96	1.32	9.7
Approach		458	0.5	458	0.5	0.859	50.6	LOS D	11.5	80.7	0.94	0.96	1.32	14.4
All Vehicles		1444	0.5	1444	0.5	0.859	37.4	LOS C	22.3	157.2	0.92	0.88	1.09	24.5

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

* Critical Movement (Signal Timing)

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: 19502sid-201103 with SMEC upgrade (100 Resi)

Template: Default Site User Report

Site: 101 [TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - 2032 FB+Resi+Dev PM (Site Folder: 2032 Future Base + Resi + Dev PM)]

Network: 26 [2032 FB+Resi+Dev PM (Network Folder: 2032 FB+Resi+Dev)]

PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1b	L3	17	0.0	17	0.0	0.639	22.4	LOS B	4.6	33.2	0.92	1.11	1.36	44.4
3a	R1	407	3.1	407	3.1	0.639	29.7	LOS C	4.6	33.2	0.91	1.11	1.36	50.8
12	R2	125	7.6	125	7.6	0.639	26.8	LOS B	4.0	29.4	0.90	1.11	1.37	31.2
12u	U	1	0.0	1	0.0	0.639	28.9	LOS C	4.0	29.4	0.90	1.11	1.37	31.2
Approach		551	4.0	550 N1	4.0	0.639	28.8	LOS C	4.6	33.2	0.91	1.11	1.37	48.0
East: Munibung Road														
1	L2	326	1.3	326	1.3	0.274	4.4	LOS A	2.5	17.4	0.83	0.57	0.83	41.2
4a	L1	608	4.0	608	4.0	0.741	12.1	LOS A	8.3	60.4	1.00	1.16	1.42	51.1
6b	R3	259	2.0	259	2.0	0.450	17.6	LOS B	3.3	23.2	0.96	1.02	1.06	54.7
3u	U	1	0.0	1	0.0	0.450	18.9	LOS B	3.3	23.2	0.96	1.02	1.06	34.3
Approach		1195	2.8	1195	2.8	0.741	11.2	LOS A	8.3	60.4	0.94	0.97	1.18	51.3
NorthEast: Lake Road														
24b	L3	128	4.1	128	4.1	1.166	171.2	LOS F	123.2	880.0	1.00	4.44	8.80	16.2
24a	L1	707	2.4	707	2.4	1.166	172.0	LOS F	123.2	880.0	1.00	4.44	8.80	16.2
25	T1	973	1.4	973	1.4	1.166	179.5	LOS F	123.2	880.0	1.00	3.98	8.19	21.3
26u	U	1	0.0	1	0.0	1.166	187.4	LOS F	88.5	626.9	1.00	3.83	7.99	25.6
Approach		1809	2.0	1809	2.0	1.166	176.0	LOS F	123.2	880.0	1.00	4.19	8.47	19.1
SouthWest: TC Frith Avenue														
31	T1	1021	3.9	1021	3.9	1.011	58.8	LOS E	35.4	253.4	1.00	2.18	4.19	40.1
32a	R1	471	1.8	471	1.8	1.011	53.3	LOS D	35.4	253.4	1.00	2.23	4.20	25.1
32b	R3	18	5.9	18	5.9	1.011	56.3	LOS D	35.4	253.4	1.00	2.23	4.20	25.1
32u	U	3	0.0	3	0.0	1.011	56.7	LOS E	35.4	253.4	1.00	2.23	4.20	37.7
Approach		1513	3.3	1513	3.3	1.011	57.1	LOS E	35.4	253.4	1.00	2.19	4.19	36.7
All Vehicles		5067	2.8	5067	2.8	1.166	85.6	LOS F	123.2	880.0	0.98	2.50	4.70	28.1

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

Site: 102 [Parrott St/Main Rd/ Fotheringham St - 2032 FB+Resi+Dev PM (Site Folder: 2032 Future Base + Resi + Dev PM)]

Network: 26 [2032 FB+Resi+Dev PM (Network Folder: 2032 FB+Resi+Dev)]

PM Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1	L2	22	4.8	22	4.8	0.499	4.3	LOS A	4.4	31.7	0.30	0.47	0.30	33.4
2	T1	528	4.2	528	4.2	0.499	4.5	LOS A	4.4	31.7	0.30	0.47	0.30	37.4
3	R2	181	2.3	181	2.3	0.499	9.1	LOS A	4.4	31.7	0.30	0.47	0.30	52.1
3u	U	1	0.0	1	0.0	0.499	11.2	LOS A	4.4	31.7	0.30	0.47	0.30	41.9
Approach		733	3.7	733	3.7	0.499	5.7	LOS A	4.4	31.7	0.30	0.47	0.30	44.0
East: Fotheringham Road														
4	L2	34	0.0	34	0.0	0.075	7.6	LOS A	0.5	3.4	0.74	0.72	0.74	45.5
5	T1	1	0.0	1	0.0	0.075	7.8	LOS A	0.5	3.4	0.74	0.72	0.74	36.5
6	R2	19	0.0	19	0.0	0.075	12.4	LOS A	0.5	3.4	0.74	0.72	0.74	46.3
6u	U	1	0.0	1	0.0	0.075	14.5	LOS A	0.5	3.4	0.74	0.72	0.74	53.6
Approach		55	0.0	55	0.0	0.075	9.4	LOS A	0.5	3.4	0.74	0.72	0.74	45.7
North: Main Road														
7	L2	320	1.3	289	1.3	0.754	6.6	LOS A	9.4	67.3	0.75	0.64	0.78	51.0
8	T1	693	2.6	626	2.6	0.754	6.8	LOS A	9.4	67.3	0.75	0.64	0.78	45.4
9	R2	39	2.7	35	2.7	0.754	11.5	LOS A	9.4	67.3	0.75	0.64	0.78	32.4
9u	U	1	0.0	1	0.0	0.754	13.5	LOS A	9.4	67.3	0.75	0.64	0.78	43.5
Approach		1053	2.2	952 N1	2.2	0.754	6.9	LOS A	9.4	67.3	0.75	0.64	0.78	47.2
West: Parrott Street														
10	L2	2	0.0	2	0.0	0.011	6.1	LOS A	0.1	0.4	0.69	0.64	0.69	20.8
11	T1	1	0.0	1	0.0	0.011	6.6	LOS A	0.1	0.4	0.69	0.64	0.69	48.2
12	R2	4	0.0	4	0.0	0.011	10.7	LOS A	0.1	0.4	0.69	0.64	0.69	34.9
12u	U	1	0.0	1	0.0	0.011	12.8	LOS A	0.1	0.4	0.69	0.64	0.69	13.5
Approach		8	0.0	8	0.0	0.011	9.3	LOS A	0.1	0.4	0.69	0.64	0.69	32.3
All Vehicles		1848	2.7	1748 N1	2.9	0.754	6.5	LOS A	9.4	67.3	0.56	0.57	0.58	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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

Site: 103 [Munibung Road/Hague Road - 2032 FB+Resi+Dev PM (Site Folder: 2032 Future Base + Resi + Dev PM)]

Network: 26 [2032 FB+Resi+Dev PM (Network Folder: 2032 FB+Resi+Dev)]

PM Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
11	T1	725	3.2	702	3.2	0.217	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		725	3.2	702[N1]	3.2	0.217	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Hague Road														
21	L2	323	3.3	323	3.3	0.356	8.4	LOS A	2.1	15.0	0.54	0.72	0.58	27.1
Approach		323	3.3	323	3.3	0.356	8.4	LOS A	2.1	15.0	0.54	0.72	0.58	27.1
North: Munibung Road														
24	L2	32	3.3	32	3.3	0.236	5.6	LOS A	0.0	0.0	0.00	0.04	0.00	28.1
5	T1	859	2.6	859	2.6	0.236	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	58.5
Approach		891	2.6	891	2.6	0.236	0.2	NA	0.0	0.0	0.00	0.02	0.00	54.9
All Vehicles		1939	2.9	1916[N1]	3.0	0.356	1.5	NA	2.1	15.0	0.09	0.13	0.10	50.8

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.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

Site: 104 [Munibung Road/Bunnings Access/ Costco Access - 2032 FB+Resi+Dev PM (Site Folder: 2032 Future Base + Resi + Dev PM)]

Network: 26 [2032 FB+Resi+Dev PM (Network Folder: 2032 FB+Resi+Dev)]

PM Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 110 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Sequence1
Reference Phase: Phase A
Input Phase Sequence: A, D, E, F, F1*, F2*
Output Phase Sequence: A, D, E, F
(* Variable Phase)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
1	L2	80	6.6	77	6.6	* 0.868	59.7	LOS E	21.4	154.3	1.00	1.04	1.23	13.8
2	T1	301	2.4	291	2.4	* 0.868	54.1	LOS D	21.4	154.3	1.00	1.04	1.23	24.5
3	R2	344	3.1	333	3.0	* 0.735	35.5	LOS C	13.1	94.3	0.98	0.88	1.02	21.0
Approach		725	3.2	702 N1	3.2	0.868	45.9	LOS D	21.4	154.3	0.99	0.96	1.13	22.0
East: Costco Access														
4	L2	34	3.1	34	3.1	0.183	30.1	LOS C	1.4	10.0	0.91	0.72	0.91	18.8
5	T1	14	0.0	14	0.0	0.183	24.5	LOS B	1.4	10.0	0.91	0.72	0.91	26.2
6	R2	91	5.8	91	5.8	* 0.430	56.0	LOS D	4.7	34.4	0.97	0.78	0.97	25.7
Approach		138	4.6	138	4.6	0.430	46.5	LOS D	4.7	34.4	0.95	0.75	0.95	24.9
North: Munibung Road														
7	L2	69	3.0	69	3.0	0.865	58.6	LOS E	21.8	156.3	1.00	1.02	1.22	26.0
8	T1	666	2.5	666	2.5	0.865	53.0	LOS D	21.8	156.3	1.00	1.01	1.22	22.0
9	R2	46	2.3	46	2.3	0.100	25.1	LOS B	1.3	9.3	0.80	0.72	0.80	35.6
Approach		782	2.6	782	2.6	0.865	51.8	LOS D	21.8	156.3	0.99	1.00	1.20	23.1
West: Bunnings Access														
10	L2	43	2.4	43	2.4	0.334	43.1	LOS D	5.5	39.7	0.87	0.77	0.87	28.4
11	T1	14	0.0	14	0.0	0.334	37.5	LOS C	5.5	39.7	0.87	0.77	0.87	20.4
12	R2	191	3.3	191	3.3	0.334	43.5	LOS D	5.5	39.7	0.87	0.77	0.87	11.1
Approach		247	3.0	247	3.0	0.334	43.1	LOS D	5.5	39.7	0.87	0.77	0.87	16.0
All Vehicles		1893	3.0	1869 N1	3.0	0.868	48.0	LOS D	21.8	156.3	0.97	0.94	1.11	22.1

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

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.

USER REPORT FOR NETWORK SITE

All Movement Classes

Project: 19502sid-201103 with SMEC upgrade (100 Resi)

Template: Default Site User Report

Site: 101 [TC Frith Ave/Main Rd/Munibung Rd/Lake Rd - 2032 FB+Resi+Dev Sat (Site Folder: 2032 Future Base + Resi + Dev Sat)]

Network: 27 [2032 FB+Resi+Dev Sat (Network Folder: 2032 FB+Resi+Dev)]

Saturday Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1b	L3	14	0.0	14	0.0	0.896	38.9	LOS C	11.3	81.0	0.99	1.50	2.53	35.6
3a	R1	479	2.9	479	2.9	0.896	46.8	LOS D	11.3	81.0	0.99	1.50	2.52	43.0
12	R2	267	2.4	267	2.4	0.896	49.0	LOS D	9.5	67.7	0.97	1.46	2.50	22.2
12u	U	1	0.0	1	0.0	0.896	51.6	LOS D	9.5	67.7	0.97	1.46	2.50	22.2
Approach		761	2.6	761	2.6	0.896	47.4	LOS D	11.3	81.0	0.98	1.48	2.51	37.5
East: Munibung Road														
1	L2	349	1.8	349	1.8	0.245	3.5	LOS A	2.0	14.3	0.67	0.45	0.67	43.0
4a	L1	577	1.6	577	1.6	0.596	6.8	LOS A	5.6	39.6	0.97	0.78	1.13	53.4
6b	R3	403	1.3	403	1.3	0.596	18.2	LOS B	5.6	39.6	0.94	1.04	1.16	54.8
3u	U	1	0.0	1	0.0	0.596	19.3	LOS B	4.7	33.0	0.94	1.06	1.16	34.0
Approach		1331	1.6	1331	1.6	0.596	9.4	LOS A	5.6	39.6	0.88	0.77	1.02	53.1
NorthEast: Lake Road														
24b	L3	231	3.2	231	3.2	1.116	136.8	LOS F	91.2	654.2	1.00	3.75	7.40	18.9
24a	L1	483	3.5	483	3.5	1.116	137.9	LOS F	91.2	654.2	1.00	3.75	7.40	18.9
25	T1	836	1.1	836	1.1	1.116	146.3	LOS F	91.2	654.2	1.00	3.34	6.87	24.2
26u	U	1	0.0	1	0.0	1.116	155.1	LOS F	63.0	445.4	1.00	3.20	6.67	28.7
Approach		1551	2.2	1551	2.2	1.116	142.3	LOS F	91.2	654.2	1.00	3.53	7.11	22.0
SouthWest: TC Frith Avenue														
31	T1	1011	0.9	1011	0.9	1.359	344.3	LOS F	175.0	1241.9	1.00	6.33	16.68	13.3
32a	R1	645	2.0	645	2.0	1.359	342.4	LOS F	175.0	1241.9	1.00	7.23	18.46	5.8
32b	R3	8	0.0	8	0.0	1.359	345.2	LOS F	175.0	1241.9	1.00	7.23	18.46	5.8
32u	U	5	0.0	5	0.0	1.359	346.0	LOS F	175.0	1241.9	1.00	7.23	18.46	10.1
Approach		1669	1.3	1669	1.3	1.359	343.6	LOS F	175.0	1241.9	1.00	6.68	17.38	10.6
All Vehicles		5312	1.8	5312	1.8	1.359	158.7	LOS F	175.0	1241.9	0.97	3.54	8.16	18.4

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Site: 102 [Parrott St/Main Rd/ Fotheringham St - 2032 FB+Resi+Dev Sat (Site Folder: 2032 Future Base + Resi + Dev Sat)]

Network: 27 [2032 FB+Resi+Dev Sat (Network Folder: 2032 FB+Resi+Dev)]

Saturday Peak
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Main Road														
1	L2	16	0.0	16	0.0	0.595	5.1	LOS A	5.9	41.8	0.58	0.56	0.58	31.8
2	T1	613	2.7	613	2.7	0.595	5.4	LOS A	5.9	41.8	0.58	0.56	0.58	34.9
3	R2	131	1.6	131	1.6	0.595	10.0	LOS A	5.9	41.8	0.58	0.56	0.58	50.9
3u	U	1	0.0	1	0.0	0.595	12.0	LOS A	5.9	41.8	0.58	0.56	0.58	40.2
Approach		760	2.5	760	2.5	0.595	6.2	LOS A	5.9	41.8	0.58	0.56	0.58	40.3
East: Fotheringham Road														
4	L2	147	1.4	147	1.4	0.375	8.5	LOS A	2.6	18.7	0.82	0.85	0.82	44.4
5	T1	1	0.0	1	0.0	0.375	8.7	LOS A	2.6	18.7	0.82	0.85	0.82	44.5
6	R2	131	1.6	131	1.6	0.375	13.4	LOS A	2.6	18.7	0.82	0.85	0.82	44.8
6u	U	1	0.0	1	0.0	0.375	15.4	LOS B	2.6	18.7	0.82	0.85	0.82	52.5
Approach		280	1.5	280	1.5	0.375	10.8	LOS A	2.6	18.7	0.82	0.85	0.82	44.6
North: Main Road														
7	L2	147	1.4	138	1.4	0.612	5.2	LOS A	5.9	42.4	0.57	0.54	0.57	51.7
8	T1	675	3.0	633	2.9	0.612	5.4	LOS A	5.9	42.4	0.57	0.54	0.57	46.4
9	R2	18	5.9	17	5.8	0.612	10.1	LOS A	5.9	42.4	0.57	0.54	0.57	33.1
9u	U	1	0.0	1	0.0	0.612	12.1	LOS A	5.9	42.4	0.57	0.54	0.57	44.8
Approach		841	2.8	789 N1	2.7	0.612	5.5	LOS A	5.9	42.4	0.57	0.54	0.57	47.4
West: Parrott Street														
10	L2	16	0.0	16	0.0	0.060	7.9	LOS A	0.4	2.7	0.81	0.76	0.81	18.0
11	T1	1	0.0	1	0.0	0.060	8.3	LOS A	0.4	2.7	0.81	0.76	0.81	46.9
12	R2	18	5.9	18	5.9	0.060	12.7	LOS A	0.4	2.7	0.81	0.76	0.81	32.8
12u	U	1	0.0	1	0.0	0.060	14.6	LOS B	0.4	2.7	0.81	0.76	0.81	12.4
Approach		36	2.9	36	2.9	0.060	10.5	LOS A	0.4	2.7	0.81	0.76	0.81	28.1
All Vehicles		1917	2.5	1865 N1	2.5	0.612	6.7	LOS A	5.9	42.4	0.62	0.60	0.62	44.7

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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

Site: 103 [Munibung Road/Hague Road - 2032 FB+Resi+Dev Sat (Site Folder: 2032 Future Base + Resi + Dev Sat)]

Network: 27 [2032 FB+Resi+Dev Sat (Network Folder: 2032 FB+Resi+Dev)]

Saturday Peak
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
11	T1	1143	2.2	949	2.2	0.279	0.0	LOS A	0.7	4.8	0.00	0.00	0.00	59.8
Approach		1143	2.2	949[N1]	2.2	0.279	0.0	NA	0.7	4.8	0.00	0.00	0.00	59.8
East: Hague Road														
21	L2	533	3.2	533	3.2	0.566	10.2	LOS A	5.9	42.7	0.63	0.84	0.90	24.3
Approach		533	3.2	533	3.2	0.566	10.2	LOS A	5.9	42.7	0.63	0.84	0.90	24.3
North: Munibung Road														
24	L2	16	0.0	16	0.0	0.208	5.5	LOS A	0.0	0.0	0.00	0.02	0.00	28.4
5	T1	778	0.5	778	0.5	0.208	0.0	LOS A	0.0	0.0	0.00	0.01	0.00	59.1
Approach		794	0.5	794	0.5	0.208	0.1	NA	0.0	0.0	0.00	0.01	0.00	57.0
All Vehicles		2469	1.9	2275[N1]	2.0	0.566	2.5	NA	5.9	42.7	0.15	0.20	0.21	47.7

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

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

Site: 104 [Munibung Road/Bunnings Access/ Costco Access - 2032 FB+Resi+Dev Sat (Site Folder: 2032 Future Base + Resi + Dev Sat)]

Network: 27 [2032 FB+Resi+Dev Sat (Network Folder: 2032 FB+Resi+Dev)]

Saturday Peak
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 130 seconds (Site Practical Cycle Time)

Timings based on settings in the Site Phasing & Timing dialog
Phase Times determined by the program
Downstream lane blockage effects included in determining phase times
Phase Sequence: Sequence1
Reference Phase: Phase A
Input Phase Sequence: A, D, E, F, F1
Output Phase Sequence: A, D, E, F, F1

Vehicle Movement Performance

Mov ID	Turn	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Munibung Road														
1	L2	219	0.0	182	0.0	* 0.577	36.5	LOS C	20.2	142.3	0.83	0.81	0.83	19.7
2	T1	309	1.0	257	1.0	0.577	31.0	LOS C	20.2	142.3	0.83	0.81	0.83	32.0
3	R2	615	3.6	510	3.7	* 0.827	44.7	LOS D	27.1	195.8	0.98	0.93	1.06	18.1
Approach		1143	2.2	949 N1	2.2	0.827	39.4	LOS C	27.1	195.8	0.91	0.87	0.95	22.5
East: Costco Access														
4	L2	59	3.6	59	3.6	0.350	36.2	LOS C	3.2	22.6	0.95	0.75	0.95	16.4
5	T1	26	0.0	26	0.0	0.350	30.6	LOS C	3.2	22.6	0.95	0.75	0.95	23.4
6	R2	166	3.2	166	3.2	* 0.794	71.7	LOS F	11.1	79.8	1.00	0.89	1.18	22.2
Approach		252	2.9	252	2.9	0.794	59.1	LOS E	11.1	79.8	0.98	0.84	1.10	21.6
North: Munibung Road														
7	L2	145	2.9	145	2.9	0.883	74.1	LOS F	19.4	137.6	1.00	1.01	1.28	22.1
8	T1	393	0.5	393	0.5	* 0.883	68.5	LOS E	19.4	137.6	1.00	1.01	1.28	18.5
9	R2	74	0.0	74	0.0	0.238	29.8	LOS C	2.5	17.4	0.85	0.75	0.85	33.3
Approach		612	1.0	612	1.0	0.883	65.1	LOS E	19.4	137.6	0.98	0.98	1.22	20.8
West: Bunnings Access														
10	L2	91	1.2	91	1.2	0.878	67.8	LOS E	15.6	109.9	0.93	0.95	1.24	22.0
11	T1	26	0.0	26	0.0	0.878	62.2	LOS E	15.6	109.9	0.93	0.95	1.24	14.7
12	R2	340	0.3	340	0.3	0.878	68.0	LOS E	15.6	109.9	0.93	0.94	1.25	7.6
Approach		457	0.5	457	0.5	0.878	67.6	LOS E	15.6	109.9	0.93	0.94	1.24	11.7
All Vehicles		2463	1.7	2269 N 1	1.8	0.883	54.2	LOS D	27.1	195.8	0.94	0.91	1.10	19.6

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

* Critical Movement (Signal Timing)
N1 Arrival Flow value is reduced due to capacity constraint at oversaturated upstream lanes.