

Consultant Traffic Engineers

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File: 21-038

11 May 2021

Mr Andrew Chown
Principal Consultant
URPS
Unit 12/154 Fullarton Road
Rose Park SA 5067

Via email: achown@urps.com.au

Dear Andrew,

PROPOSED CODE AMENDMENT (REZONING) – 13 FLEMINGTON STREET, GLENSIDE – TRAFFIC ASSESSMENT

I refer to our recent discussions with respect to the proposal to amend the Planning & Design Code in relation to the zoning for the above site.

As requested, we have undertaken the following review of the traffic related impacts resulting from anticipated residential development associated with the proposed rezoning of the subject land.

EXISTING SITUATION**Subject Land**

The subject land is located within a *Community Facilities Zone*. Prior to implementation of the Planning & Design Code, this land was located within a *Mixed Use (Glenside) Area 4 Zone*.

The subject land is irregular in shape with an overall area of approximately 1.44 hectares.

The subject site is located on the northern side of Flemington Street, Glenside, with a frontage to this roadway of approximately 15m.

The subject site currently accommodates:-

- Unit 1: Adelaide Hebrew Congregations Synagogue, which remains operational. Attendances at this place of worship are of the order of 30 person; and
- Unit 2: Masada College (primary school), which closed in 2011. This school previously had an enrolment of up to 120 students attending classes from Reception to Year 7.

An internal roadway is provided along the 15m wide section of the subject land between Flemington Street and the primary portion of the subject land. This portion of roadway also accommodates the majority of car parking associated with the subject land, provided in 90-degree arrangement along the western boundary of the site.

Aerial imagery of the subject site and surrounding locality is provided in *Figure 1* below.

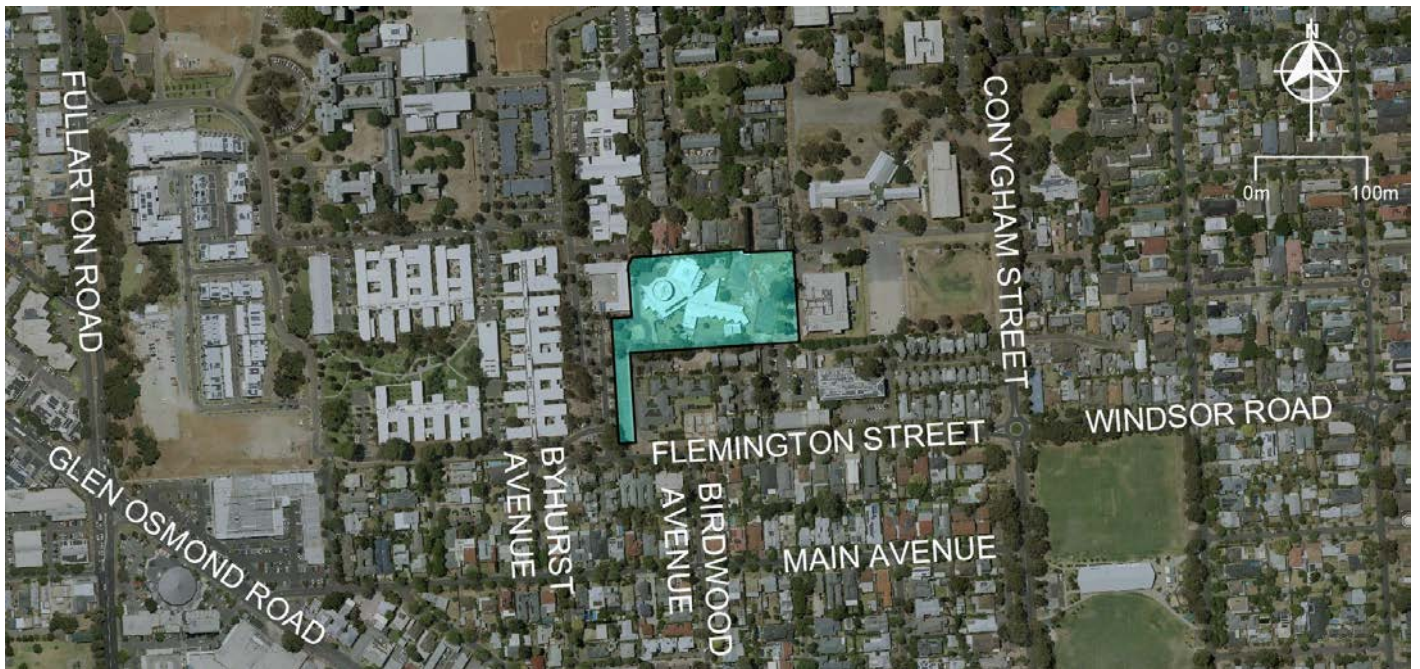


Figure 1: Subject site and surrounding locality

Adjoining Road Network

Flemington Street is a two-way undivided local roadway under the care and control of the City of Burnside, with a default speed limit of 50km/h. This roadway provides a kerb to kerb width of approximately 6.9m adjacent to the subject site, which widens to approximately 9.0m to the east of the subject land. Flemington Street is utilised as part of the City - Crafers Bikeway. Flemington Street services a mixture of residential, commercial, and health related land uses.

Kerbside parking is typically unrestricted in the locality, with the exception of 'No Parking 8.30am - 5.00pm Monday to Friday' on the northern side of Flemington Street between the subject site and the intersection of this roadway with Birdwood Avenue.

The recorded road crash history in the locality of the subject site is very low. On the adjoining roadways within 200m of the existing site access point, there was only one recorded crash in the latest five-year reporting period (from 2015 to 2019, inclusive). This crash occurred approximately 25m west of the subject site, was classified as 'Hit Parked Vehicle', occurred at night, and did not result in any injury.

There have been no recorded crashes at the nearby intersections of Flemington Street and Main Avenue with Birdwood Avenue and Byhurst Avenue, respectively. There have been three recorded crashes at the intersection of Flemington Street with Conyngham Street and Windsor Road (controlled by a roundabout). All three of these crashes involved cyclists and were classified as 'right angle' crashes.

Public transport opportunities in the locality are provided in the form of high-frequency bus routes on the surrounding arterial roadways (Glen Osmond Road, Fullarton Road, Greenhill Road), with only school bus services associated with Glenunga International High School operating along Conyngham Street.

Details of recent traffic surveys undertaken by the City of Burnside on the following roadways within the locality have been obtained from Council, namely:-

- Byhurst Avenue at a location approximately midblock between Flemington Street and Main Avenue;
- Birdwood Avenue at a location approximately midblock between Flemington Street and Main Avenue;
- Flemington Street at a location approximately midblock between Birdwood Avenue and Conyngham Street; and
- Main Avenue at the location approximately midblock between Holland Street and Birdwood Avenue.

Table 1 (below) includes a summary of peak hour and weekday traffic volumes on roads within the locality of the subject land.

Table 1: Peak hour and weekday traffic volumes – Council survey data

Roadway	AM weekday peak hour volume	PM weekday peak hour volume	Average weekday traffic volume
Birdwood Avenue	25 vph	22 vph	207 vpd
Byhurst Avenue	38 vph	38 vph	423 vpd
Flemington Street	113 vph	107 vph	934 vpd
Main Avenue	195 vph	236 vph	2575 vpd

From the above traffic volumes, it is identified that both Birdwood Avenue and Byhurst Avenue are currently functioning as local roadways with relatively low volumes. This indicates that there are neither capacity nor amenity issues associated with these roadways. Typical of a residential street the peak hour volumes are equivalent to approximately 10% of the average weekday traffic volume.

The volumes of traffic along Flemington Street also indicate that there are no amenity or capacity issues on this roadway

The volumes of traffic on Main Avenue are typical of a collector roadway servicing the locality.

In addition to the above data, traffic surveys were undertaken by this firm at critical intersections in both directions of the site locality to identify existing peak hour traffic volumes and to determine the distribution of traffic on these roadways. These included the roundabout-controlled intersection of Flemington Street with Conyngham Street and Windsor Road, and the T-intersection of Byhurst Avenue (i.e., the continuation of Flemington Street) with Main Avenue. Based on the adjoining road layout and observations on-site, it is anticipated that traffic movements associated with the subject site along Birdwood Avenue would be negligible.

These surveys were undertaken over 15-minute intervals between 7.00am and 10.00 am, and 3.00pm and 6.00pm on a typical weekday (Wednesday 31st March 2021). The full results of these surveys are attached to this letter as *Appendix A* and summarised graphically in *Figure 2* below.



Figure 2: Surveyed am (pm) peak hour traffic volumes at the subject intersections

The am and pm peak hour periods and volumes in relation to the intersection legs relevant to the subject site are also summarised in *Table 2* below.

Table 2: Peak hour traffic volume survey results

Road	Location	AM Peak Hour Period	AM Peak Hour Volume	AM Peak Hour Period	PM Peak Hour Volume
Flemington Street	West of Conyngham Street	8.00am - 9.00am	316 movements - 93 entry - 223 exit	3:15pm - 4:15pm	308 movements - 174 entry - 134 exit
Byhurst Avenue	North of Main Avenue	8.00am - 9.00am	46 movements - 27 entry - 19 exit	4:45pm - 5:45pm	66 movements - 38 entry - 28 exit

PROPOSED CODE AMENDMENT (REZONING)

The proposed Code Amendment proposes rezoning of the subject land from *Community Facilities* to *Housing Diversity Neighbourhood*. The *Housing Diversity Neighbourhood Zone* seeks to deliver a medium density residential outcome with site areas in the order of 120m².

The current rezoning proposal does not include a detailed land division layout.

Based on a preliminary concept design prepared by this office (as attached within *Appendix B* of this report), we anticipate that the subject land could ultimately be developed to accommodate up to a maximum of 60 medium-density residential dwellings. This concept does not form part of the current application, nor should it be considered indicative of the final design of any future land division layout. This concept has only been prepared to determine an indicative number of dwellings that could be provided based on 120m² allotments and relevant road reserve requirements, in order to assess the resultant traffic impacts.

Furthermore it is understood that any future development of the subject land would be undertaken in two stages, namely:-

- Stage 1 - comprising redevelopment of the former school site; and
- Stage 2 - consisting of possible future redevelopment of the land currently occupied by the synagogue.

TRAFFIC ASSESSMENT

Forecast Vehicular Trip Generation

The *'Guide to Traffic Generating Developments'* report produced by the (former) Roads and Traffic Authority of NSW identifies the potentially relevant residential vehicular trip generation rates as identified in *Table 3* below.

Table 2: RTA residential vehicular trip generation rates

Form of Development	Daily Vehicle Trips	Weekday Peak Hour Vehicle Trips
Dwelling Houses	9 per dwelling	0.85 per dwelling
Medium Density Residential Flat Buildings		
Larger units and townhouses (three or more bedrooms)	5 - 6.5 per dwelling	0.5 - 0.65 per dwelling
Smaller units and flats (up to two bedrooms)	4 - 5 per dwelling	0.4 - 0.5 per dwelling

Given the size (120m²) of the proposed allotments, a trip generation rate equivalent to a large unit or townhouse has been adopted for the purpose of this traffic assessment, namely:

- 6.5 daily vehicle trips per dwelling, including 0.65 weekday peak hour vehicle trips per dwelling.

The subject land, with a potential to accommodate approximately 60 dwellings, is therefore anticipated to generate approximately **390 daily vehicle trips, including 39 weekday peak hour vehicle trips**, upon completion.

It should be noted that residential land uses are relatively low traffic generating developments. By way of comparison, Masada College would have historically generated greater peak hour volumes of approximately *62 weekday peak hour vehicle trips*, based on enrolment of approximately 120 students and a peak hour vehicle trip rate of 0.52 trips per student (source: *Trip generation rates for assessment of development proposals* prepared by Parsons Brinckerhoff for (then) DPTI).

However, for the purpose of this assessment, the historic land uses have been disregarded in terms of existing vehicular trip generation, given the school that previously operated on the subject land closed in 2011 and peak periods associated with places of worship do not typically correlate with peak periods on the adjoining road network.

Forecast Distribution of Traffic

The forecast distribution of the weekday peak hour traffic movements generated by the proposed land use is identified in *Figure 3* below. This figure includes:-

- Weekday peak hour traffic distributions, based on typical am (75% departure and 25% arrival) and pm (33% departure and 66% arrival) associated with residential land divisions;
- Subsequent peak hour traffic distributions based on the existing distributions of traffic in the locality as identified by the surveys; and
- Negligible if any additional traffic movements to and from Birdwood Avenue. This route would be inefficient and is forecast to accommodate only negligible volumes of infrequent traffic associated with the proposed land use.



SIDRA analysis of the adjoining intersections

SIDRA analysis has been undertaken of the existing and potential operation of the intersections of Byhurst Avenue with Main Avenue, and Flemington Street with Conyngham Street and Windsor Road, under both current and future conditions.

These SIDRA analyses have been undertaken based on the volumes identified in Figure 2 for the existing intersections, and Figure 4 (below) for the future scenario. Figure 4 is based on the combination of the traffic volumes identified in Figures 2 and 3, i.e., on the worst-case basis that the respective peak periods correlate, for the future conditions.



The relevant SIDRA 'movement summaries' of both intersections under existing and future conditions are provided within *Appendix C*.

The outcomes of these assessments indicate that:-

- There will be minimal impact associated with future residential development of up to 60 dwellings on the subject land on the current operation the T-intersection of Byhurst Avenue with Main Avenue, with the Level of Service (LOS) 'A' remaining in both the am and pm peak periods on a weekday in the event that the subject land is redeveloped;
- A maximum queue of only one vehicle on Byhurst Avenue at the 95th percentile probability level when drivers are waiting to turn onto Main Avenue during both the am and pm peak periods; and
- Essentially no change in the degree of saturation nor the average delay to drivers on any leg of the intersection from that currently occurring given the very small increases of traffic using this intersection as a result of future residential development on the subject land.

The SIDRA analysis of the intersection of Flemington Street with both Conyngham Street and Windsor Avenue has identified that in the am peak period:-

- The subject intersection is currently operating with a LOS A this will not change as a result of the potential development of the subject land;
- The average delay to all vehicles entering the subject intersection will essentially be unchanged from current operating conditions and will be at most 11.4 seconds on any leg of the intersection;
- The maximum queue on any approach of the intersection, based upon the 95th percentile probability level, will remain at less than three vehicles (2.6 vehicles rounded up); and
- The degree of saturation will increase marginally from 0.356 to 0.367 in the event that the subject land is developed with up to 60 dwellings.

The SIDRA analysis of the intersection of Flemington Street with both Conyngham Street and Windsor Avenue has further identified that in the pm peak period:-

- The subject intersection which is currently operating with a LOS A will not change as a result of the potential development of the subject land;
- The average delay to all vehicles entering the subject intersection will essentially be unchanged from current operating conditions and will be at most 11.3 seconds on any leg of the intersection;
- The maximum queue on any approach the intersection, based upon the 95th percentile probability level, will remain at less than three vehicles (2.6 vehicles rounded up); and
- The degree of saturation will increase marginally from 0.345 to 0.357 in the event that the subject land is developed with up to 60 dwellings.

In summary, it is considered that there will be no significant traffic impacts on the adjoining road network as a result of potential future residential development on the subject land within the near vicinity of the subject site.

Furthermore, the subject land historically generated levels of traffic during both school arrival and departure periods which would have been greater than that anticipated by the potential residential development on the subject land.

Wider Road Network

The majority of the additional traffic volumes associated with the proposed land use would access the wider road network via the adjoining arterial roads. Based on the volumes identified in *Figure 3*, this would typically occur via the intersections of Conyngham Street with Glen Osmond Road, and Conyngham Street with Greenhill Road. Only low volumes of movements are anticipated to occur via the intersections of Main Avenue with Glen Osmond Road, and Windsor Road with Portrush Road.

In any event, residential infill projects such as the proposed use of the subject land are not considered particularly critical in terms of impacts on the wider arterial road network. The forecast volumes identified in *Figure 3* would be effectively negligible in terms of the volumes accommodated on the adjoining arterial roadways. In any event, these additional volumes would remain well within forecast annual increases in traffic volumes through these intersections, and would also remain well within daily fluctuations of traffic volumes.

While the majority of trips generated by any future residential development would invariably enter and exit the locality via the wider arterial road network it is noted in particular that:-

- The intersections of Conyngham Street with both Greenhill Road to the north and Glen Osmond Road to the south are both signalised and would be negligibly impacted by the very small forecast increases in traffic volumes associated with future residents of the subject land; and
- The intersection of Main Avenue with Glen Osmond Road is currently being upgraded with these works including provision of separate left and right turn lanes from Main Avenue onto this arterial road which will invariably result in increased capacity and a reduction in delay to traffic exiting onto this arterial road.

In summary it is considered that the adjoining road network will accommodate the anticipated traffic generation associated with future residential development on the potential land division and that there should be no requirement to provide additional external roadworks to accommodate such traffic.

Pedestrian and Cyclist Facilities

The proposed rezoning of the subject land does not include detailed infrastructure design, including pedestrian and cyclist facilities.

Based on the concept provided in *Appendix B*, there would be ample opportunity within the 15m wide primary road reserve to facilitate pedestrian and cyclist facilities together with traffic and on-street parking areas. Such facilities would readily connect to the existing footpath and road network on Flemington Street, including the City - Crafers Bikeway located directly adjacent to the subject site.

Parking Facilities

Car parking requirements associated with the proposed rezoning of the subject land does not form part of the subject application, but has been noted below.

The Planning and Design Code identifies that each dwelling would require 1 or 2 on-site car parking spaces depending on the number of bedrooms per dwelling (with at least one covered space). Such car parking requirements would typically be able to be satisfied on-site.

The Planning and Design Code also identifies that on-street car parking should be provided at a rate of 0.33 spaces per dwelling. Based on the concept design in *Appendix B* (60 dwellings), there will be ample opportunity to at least meet and potentially to exceed this requirement (20 spaces) within the primary road reserve areas. As such, there may also be an opportunity to provide additional 'on-street' parking spaces (either reserved or unreserved) to supplement potential on-site shortfalls in the event that only one covered on-site space would be provided for a small number of the future 3+ bedroom dwellings.

There would not be a Planning and Design Code requirement for the proposed land use / zoning. However, there would typically be capacity to accommodate formalised bicycle parking spaces on-site (e.g., wall mounted bicycle racks within garages) or in the on-street areas (shared bicycle racks within verges) for resident and visitor use, respectively.

In summary, there should be ample opportunity to accommodate the relevant parking requirements for the various dwellings subject to detailed design.

SUMMARY AND CONCLUSIONS

In summary, I consider that the proposed rezoning of the subject land to accommodate medium density residential land uses would not result in adverse traffic impacts on the surrounding locality.

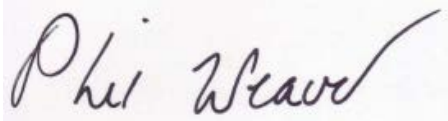
The above traffic assessment has been based on potential development of up to 60 allotments within the overall land area. However, this is likely to be an overestimate. Furthermore, it is understood that any future development of the subject land would potentially be undertaken in two stages namely redevelopment of the school site, previously occupied by Masada College, and a possible second stage involving the land currently occupied by the synagogue associated with the Adelaide Hebrew Congregation.

Consequently, the above traffic assessment examines the potential traffic impacts associated with a worst-case scenario, i.e., future residential development over the entire site.

Notwithstanding the above assessment clearly identifies that there will remain more than sufficient capacity on the adjoining road network to accommodate the additional traffic movements associated with maximum number of residential dwellings which could theoretically be provided on the subject land.

It is therefore not anticipated that any off-site infrastructure works (beyond upgrading of the 'T-intersection' associated with the subject land with Flemington Street) would be required as a result of the proposed rezoning and subsequent residential land division.

Yours sincerely,

A handwritten signature in black ink that reads "Phil Weaver". The signature is written in a cursive style with a long, sweeping tail on the letter 'v'.

Phil Weaver
Phil Weaver and Associates Pty Ltd

Enc: *Appendix A - Traffic Survey Results*

Appendix B - Concept Design

Appendix C - SIDRA Movement Summaries

Appendix A(1) - Traffic surveys results at the intersection of Flemington Street with Conyngham Street and Windsor Road														
Wednesday 31/03/21	Conyngham Street North			Windsor Road			Conyngham Street South			Flemington Street			Total Flemington (hour)	
	Right	Through	Left	Right	Through	Left	Right	Through	Left	Right	Through	Left		
am	7:00-7:15	5	22	1	2	0	2	3	18	2	7	2	3	-
	7:15-7:30	5	35	1	0	4	3	5	12	7	8	0	4	-
	7:30-7:45	6	52	3	4	3	8	7	22	5	16	3	4	-
	7:45-8:00	8	71	6	0	2	6	7	25	1	15	3	10	123
	8:00-8:15	5	83	2	1	0	4	4	41	4	31	8	10	162
	8:15-8:30	6	70	2	1	5	2	5	42	5	34	6	22	212
	8:30-8:45	20	79	6	3	13	5	9	48	11	34	21	10	284
	8:45-9:00	14	67	2	2	4	3	8	47	6	25	10	12	316
	9:00-9:15	7	74	5	1	4	3	12	43	5	13	7	5	299
	9:15-9:30	15	67	3	3	2	10	11	48	9	17	4	5	273
9:30-9:45	24	68	1	4	3	5	3	56	13	23	7	24	258	
9:45-10:00	19	54	0	0	2	4	3	56	12	12	5	17	254	
pm	3:00-3:15	13	42	1	3	5	13	3	51	6	5	1	10	-
	3:15-3:30	31	55	4	1	3	5	9	68	13	12	6	23	-
	3:30-3:45	29	75	3	4	9	6	5	65	15	18	5	17	-
	3:45-4:00	22	89	5	1	2	12	11	69	8	19	5	11	288
	4:00-4:15	20	65	0	5	12	9	6	52	10	10	1	7	308
	4:15-4:30	12	61	0	2	10	6	4	61	11	9	1	4	267
	4:30-4:45	24	48	3	5	3	8	0	69	14	10	5	6	236
	4:45-5:00	20	58	0	5	4	8	2	69	6	2	3	3	207
	5:00-5:15	28	69	2	4	4	3	3	60	18	5	2	11	215
	5:15-5:30	21	62	0	5	6	3	6	73	15	12	3	14	239
5:30-5:45	26	64	1	3	6	7	4	81	10	3	3	10	235	
5:45-6:00	17	46	2	0	16	8	4	80	20	11	6	12	279	

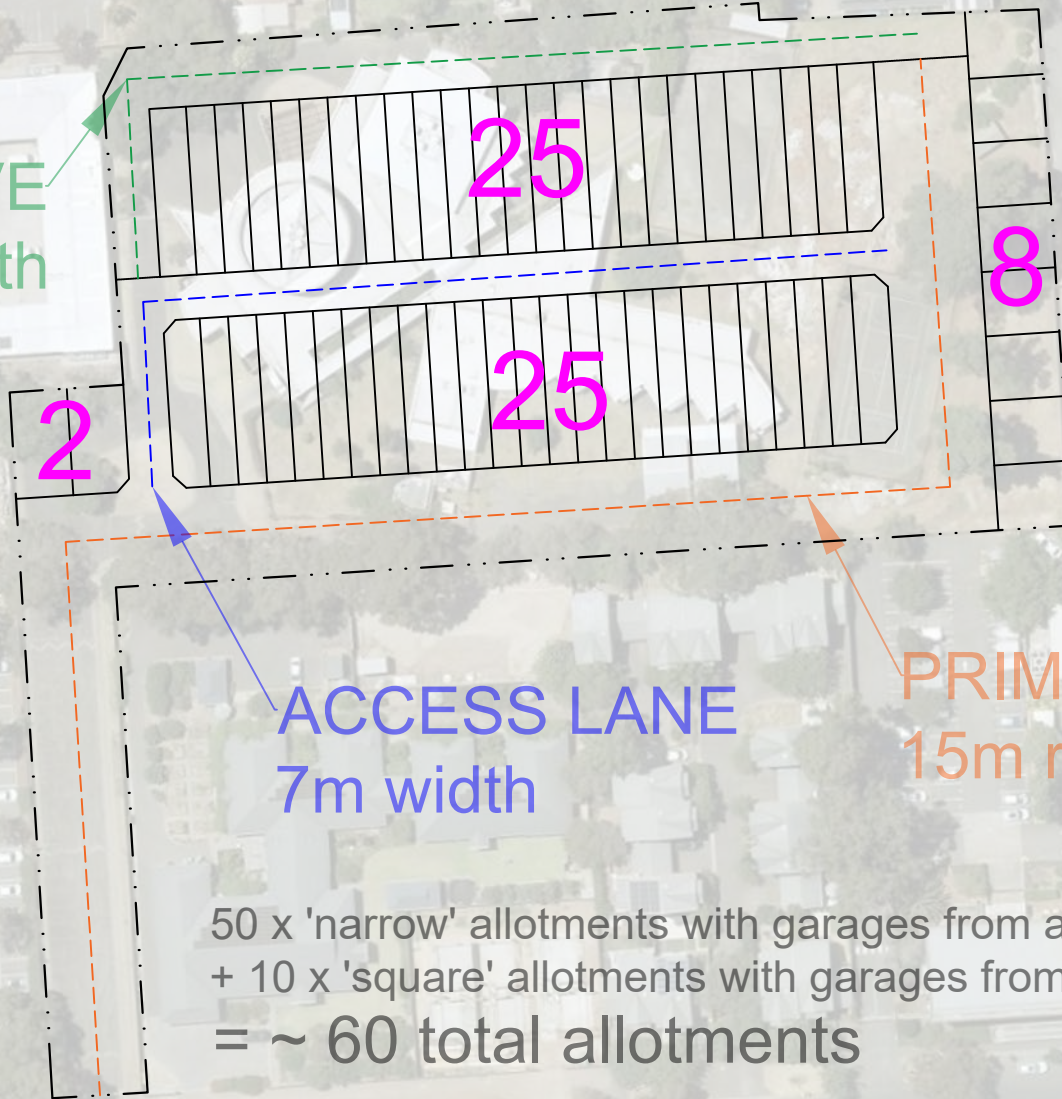
Appendix A(2) - Traffic surveys results at the intersection of Byhurst Avenue with Main Avenue								
	Wednesday 31/03/21	Main Ave	Byhurst Avenue				Main Ave	Total Byhurst (hour)
		Westbound	Right In	Left Out	Right Out	Left In	Eastbound	
am	7:00-7:15	7	0	0	0	3	9	-
	7:15-7:30	5	0	1	2	1	12	-
	7:30-7:45	11	0	0	5	3	9	-
	7:45-8:00	14	2	0	3	2	13	22
	8:00-8:15	8	1	0	6	3	20	29
	8:15-8:30	12	1	0	3	6	22	35
	8:30-8:45	19	0	0	6	9	26	42
	8:45-9:00	15	1	0	4	6	24	46
	9:00-9:15	19	0	0	4	3	12	43
	9:15-9:30	18	0	2	4	5	20	44
	9:30-9:45	19	0	0	2	5	25	36
	9:45-10:00	25	0	1	4	3	23	33
pm	3:00-3:15	8	0	1	5	1	30	-
	3:15-3:30	21	1	2	5	10	36	-
	3:30-3:45	32	1	2	4	10	19	-
	3:45-4:00	10	0	1	3	4	29	50
	4:00-4:15	13	0	1	8	5	35	57
	4:15-4:30	17	1	0	2	6	38	48
	4:30-4:45	17	0	1	3	1	27	36
	4:45-5:00	23	0	0	10	24	4	62
	5:00-5:15	12	0	4	4	4	34	60
	5:15-5:30	17	0	2	4	6	33	63
	5:30-5:45	17	0	0	4	4	37	66
	5:45-6:00	12	2	0	5	6	29	45

APPENDIX B - CONCEPT LAYOUT



0m 25m

RESERVE
7m minimum width



50 x 'narrow' allotments with garages from access lane
+ 10 x 'square' allotments with garages from primary roadway
= ~ 60 total allotments

MOVEMENT SUMMARY

▽ Site: 101 [Byhurst Avenue with Flemington Street, Glenside]

am peak hour existing
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles													
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Back of Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		Total veh/h	HV %	v/c	sec		veh	m				km/h	
East:													
5	T1	57	1.0	0.031	0.0	LOS A	0.0	0.1	0.03	0.03	0.03	59.6	
6	R2	3	1.0	0.031	5.8	LOS A	0.0	0.1	0.03	0.03	0.03	57.3	
Approach		60	1.0	0.031	0.3	NA	0.0	0.1	0.03	0.03	0.03	59.5	
North: Byhurst Avenue													
7	L2	1	1.0	0.019	5.8	LOS A	0.1	0.4	0.23	0.57	0.23	53.0	
9	R2	20	1.0	0.019	6.0	LOS A	0.1	0.4	0.23	0.57	0.23	52.5	
Approach		21	1.0	0.019	6.0	LOS A	0.1	0.4	0.23	0.57	0.23	52.5	
West: Main Avenue - western leg													
10	L2	25	1.0	0.063	5.6	LOS A	0.0	0.0	0.00	0.12	0.00	57.3	
11	T1	97	1.0	0.063	0.0	LOS A	0.0	0.0	0.00	0.12	0.00	58.9	
Approach		122	1.0	0.063	1.2	NA	0.0	0.0	0.00	0.12	0.00	58.5	
All Vehicles		203	1.0	0.063	1.4	NA	0.1	0.4	0.03	0.14	0.03	58.1	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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Project: Z:\21-038 - 13 Flemington Street, Glenside - Land Rezoning\Sidra assessments\Main Avenue and Byhurst Avenue\Project2.sip8

MOVEMENT SUMMARY

▽ Site: 101 [Byhurst Avenue with Flemington Street, Glenside -]

am peak hour forecast
 Site Category: (None)
 Giveway / Yield (Two-Way)

Movement Performance - Vehicles													
Mov ID	Turn	Demand Total	Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back Vehicles	Queue Distance	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		veh/h	%	v/c	sec		veh	m				km/h	
East:													
5	T1	57	1.0	0.031	0.0	LOS A	0.0	0.1	0.03	0.03	0.03	59.6	
6	R2	3	1.0	0.031	5.8	LOS A	0.0	0.1	0.03	0.03	0.03	57.3	
Approach		60	1.0	0.031	0.3	NA	0.0	0.1	0.03	0.03	0.03	59.5	
North: Byhurst Avenue													
7	L2	1	1.0	0.023	5.8	LOS A	0.1	0.5	0.23	0.57	0.23	53.0	
9	R2	24	1.0	0.023	6.0	LOS A	0.1	0.5	0.23	0.57	0.23	52.5	
Approach		25	1.0	0.023	6.0	LOS A	0.1	0.5	0.23	0.57	0.23	52.5	
West: Main Avenue - western leg													
10	L2	26	1.0	0.064	5.6	LOS A	0.0	0.0	0.00	0.13	0.00	57.2	
11	T1	97	1.0	0.064	0.0	LOS A	0.0	0.0	0.00	0.13	0.00	58.8	
Approach		123	1.0	0.064	1.2	NA	0.0	0.0	0.00	0.13	0.00	58.5	
All Vehicles		208	1.0	0.064	1.5	NA	0.1	0.5	0.04	0.15	0.04	58.0	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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Project: Z:\21-038 - 13 Flemington Street, Glenside - Land Rezoning\Sidra assessments\Main Avenue and Byhurst Avenue\Project2.sip8

MOVEMENT SUMMARY

▽ Site: 101 [Byhurst Avenue with Flemington Street, Glenside]

pm peak hour existing
 Site Category: (None)
 Giveaway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	Deg. HV %	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
East:												
5	T1	73	1.0 0.038	0.0	LOS A	0.0	0.01	0.01	0.01	59.9		
6	R2	1	1.0 0.038	5.9	LOS A	0.0	0.01	0.01	0.01	57.6		
Approach		74	1.0 0.038	0.1	NA	0.0	0.01	0.01	0.01	59.8		
North: Byhurst Avenue												
7	L2	6	1.0 0.026	5.9	LOS A	0.1	0.24	0.58	0.24	52.9		
9	R2	23	1.0 0.026	6.2	LOS A	0.1	0.24	0.58	0.24	52.4		
Approach		29	1.0 0.026	6.1	LOS A	0.1	0.24	0.58	0.24	52.5		
West: Main Avenue - western leg												
10	L2	40	1.0 0.080	5.6	LOS A	0.0	0.00	0.15	0.00	57.0		
11	T1	114	1.0 0.080	0.0	LOS A	0.0	0.00	0.15	0.00	58.6		
Approach		154	1.0 0.080	1.5	NA	0.0	0.00	0.15	0.00	58.2		
All Vehicles		257	1.0 0.080	1.6	NA	0.1	0.03	0.16	0.03	57.9		

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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Organisation: PHIL WEAVER AND ASSOCIATES PTY LTD | Processed: Thursday, 15 April 2021 11:30:11 AM

Project: Z:\21-038 - 13 Flemington Street, Glenside - Land Rezoning\Sidra assessments\Main Avenue and Byhurst Avenue\Project2.sip8

MOVEMENT SUMMARY



Site: 101 [Byhurst Avenue with Flemington Street, Glenside]

pm peak hour forecast

Site Category: (None)

Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		veh/h	%	v/c	sec		veh				km/h	
East:												
5	T1	73	1.0	0.038	0.0	LOS A	0.0	0.1	0.01	0.01	59.9	
6	R2	1	1.0	0.038	5.9	LOS A	0.0	0.1	0.01	0.01	57.6	
Approach		74	1.0	0.038	0.1	NA	0.0	0.1	0.01	0.01	59.8	
North: Byhurst Avenue												
7	L2	6	1.0	0.028	5.9	LOS A	0.1	0.7	0.24	0.58	52.9	
9	R2	25	1.0	0.028	6.2	LOS A	0.1	0.7	0.24	0.58	52.4	
Approach		32	1.0	0.028	6.1	LOS A	0.1	0.7	0.24	0.58	52.5	
West: Main Avenue - western leg												
10	L2	45	1.0	0.082	5.6	LOS A	0.0	0.0	0.00	0.17	56.9	
11	T1	114	1.0	0.082	0.0	LOS A	0.0	0.0	0.00	0.17	58.5	
Approach		159	1.0	0.082	1.6	NA	0.0	0.0	0.00	0.17	58.0	
All Vehicles		264	1.0	0.082	1.7	NA	0.1	0.7	0.03	0.17	57.8	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Vehicle movement LOS values are based on average delay per movement.

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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Project: Z:\21-038 - 13 Flemington Street, Glenside - Land Rezoning\Sidra assessments\Main Avenue and Byhurst Avenue\Project2.sip8

MOVEMENT SUMMARY



Site: 101 [Flemington Street with Conyngham Street, Glenside]

Existing - am peak hour
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
		Total veh/h	HV %				Vehicles veh	Distance m				
South: Conyngham Street - southern approach												
1	L2	27	1.0	0.194	4.9	LOS A	1.2	8.7	0.28	0.50	0.28	53.2
2	T1	187	2.0	0.194	5.0	LOS A	1.2	8.7	0.28	0.50	0.28	54.0
3	R2	27	1.0	0.194	8.5	LOS A	1.2	8.7	0.28	0.50	0.28	53.7
Approach		242	1.8	0.194	5.4	LOS A	1.2	8.7	0.28	0.50	0.28	53.9
East: Windsor Road - eastern approach												
4	L2	15	1.0	0.058	7.6	LOS A	0.3	2.3	0.62	0.66	0.62	51.6
5	T1	23	1.0	0.058	7.7	LOS A	0.3	2.3	0.62	0.66	0.62	52.4
6	R2	7	1.0	0.058	11.3	LOS B	0.3	2.3	0.62	0.66	0.62	52.1
Approach		45	1.0	0.058	8.3	LOS A	0.3	2.3	0.62	0.66	0.62	52.1
North: Conyngham Street - northern approach												
7	L2	13	1.0	0.356	6.1	LOS A	2.5	18.1	0.53	0.60	0.53	52.2
8	T1	315	2.0	0.356	6.2	LOS A	2.5	18.1	0.53	0.60	0.53	53.0
9	R2	47	1.0	0.356	9.7	LOS A	2.5	18.1	0.53	0.60	0.53	52.7
Approach		375	1.8	0.356	6.6	LOS A	2.5	18.1	0.53	0.60	0.53	53.0
West: Flemington Street -Western approach												
10	L2	57	1.0	0.231	6.1	LOS A	1.4	10.0	0.48	0.65	0.48	51.6
11	T1	47	1.0	0.231	6.1	LOS A	1.4	10.0	0.48	0.65	0.48	52.4
12	R2	131	1.0	0.231	9.7	LOS A	1.4	10.0	0.48	0.65	0.48	52.1
Approach		235	1.0	0.231	8.1	LOS A	1.4	10.0	0.48	0.65	0.48	52.1
All Vehicles		897	1.6	0.356	6.8	LOS A	2.5	18.1	0.46	0.59	0.46	52.9

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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

MOVEMENT SUMMARY



Site: 101 [Flemington Street with Conygham Street, Glenside]

Forecast - am peak hour

Site Category: (None)

Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows		Deg. Satn	Average Delay	Level of Service	95% Back of Queue		Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed
		Total	HV %				Vehicles	Distance				
		veh/h	v/c	v/c	sec		veh	m				km/h
South: Conygham Street - southern approach												
1	L2	32	1.0	0.199	4.9	LOS A	1.3	8.9	0.29	0.50	0.29	53.1
2	T1	187	2.0	0.199	5.0	LOS A	1.3	8.9	0.29	0.50	0.29	54.0
3	R2	27	1.0	0.199	8.6	LOS A	1.3	8.9	0.29	0.50	0.29	53.7
Approach		246	1.8	0.199	5.4	LOS A	1.3	8.9	0.29	0.50	0.29	53.8
East: Windsor Road - eastern approach												
4	L2	15	1.0	0.061	7.8	LOS A	0.4	2.5	0.63	0.67	0.63	51.5
5	T1	25	1.0	0.061	7.8	LOS A	0.4	2.5	0.63	0.67	0.63	52.3
6	R2	7	1.0	0.061	11.4	LOS B	0.4	2.5	0.63	0.67	0.63	52.0
Approach		47	1.0	0.061	8.4	LOS A	0.4	2.5	0.63	0.67	0.63	52.0
North: Conygham Street - northern approach												
7	L2	13	1.0	0.367	6.3	LOS A	2.6	18.7	0.56	0.62	0.56	52.1
8	T1	315	2.0	0.367	6.4	LOS A	2.6	18.7	0.56	0.62	0.56	52.9
9	R2	49	1.0	0.367	9.9	LOS A	2.6	18.7	0.56	0.62	0.56	52.6
Approach		377	1.8	0.367	6.8	LOS A	2.6	18.7	0.56	0.62	0.56	52.8
West: Flemington Street -Western approach												
10	L2	65	1.0	0.257	6.1	LOS A	1.6	11.5	0.50	0.65	0.50	51.6
11	T1	54	1.0	0.257	6.2	LOS A	1.6	11.5	0.50	0.65	0.50	52.4
12	R2	143	1.0	0.257	9.7	LOS A	1.6	11.5	0.50	0.65	0.50	52.1
Approach		262	1.0	0.257	8.1	LOS A	1.6	11.5	0.50	0.65	0.50	52.0
All Vehicles		933	1.5	0.367	6.9	LOS A	2.6	18.7	0.47	0.60	0.47	52.8

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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

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Project: Z:\21-038 - 13 Flemington Street, Glenside - Land Rezoning\Sidra assessments\Flemington Street and Conygham Street intersection\Project1.sip8

MOVEMENT SUMMARY



Site: 101 [Flemington Street with Conygham Street, Glenside]

Existing - pm peak hour
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total	Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed	
		veh/h	%	v/c	sec		veh				km/h	
South: Conygham Street - southern approach												
1	L2	48	1.0	0.305	5.5	LOS A	2.1	14.7	0.42	0.55	52.7	
2	T1	267	2.0	0.305	5.6	LOS A	2.1	14.7	0.42	0.55	53.5	
3	R2	33	1.0	0.305	9.1	LOS A	2.1	14.7	0.42	0.55	53.3	
Approach		348	1.8	0.305	5.9	LOS A	2.1	14.7	0.42	0.55	53.4	
East: Windsor Road - eastern approach												
4	L2	34	1.0	0.090	7.6	LOS A	0.5	3.6	0.61	0.67	51.6	
5	T1	27	1.0	0.090	7.6	LOS A	0.5	3.6	0.61	0.67	52.5	
6	R2	12	1.0	0.090	11.2	LOS B	0.5	3.6	0.61	0.67	52.2	
Approach		73	1.0	0.090	8.2	LOS A	0.5	3.6	0.61	0.67	52.0	
North: Conygham Street - northern approach												
7	L2	13	1.0	0.345	5.3	LOS A	2.5	18.0	0.39	0.54	52.4	
8	T1	299	2.0	0.345	5.4	LOS A	2.5	18.0	0.39	0.54	53.3	
9	R2	107	1.0	0.345	8.9	LOS A	2.5	18.0	0.39	0.54	53.0	
Approach		419	1.7	0.345	6.3	LOS A	2.5	18.0	0.39	0.54	53.2	
West: Flemington Street -Western approach												
10	L2	61	1.0	0.152	6.6	LOS A	0.9	6.4	0.54	0.67	51.6	
11	T1	18	1.0	0.152	6.6	LOS A	0.9	6.4	0.54	0.67	52.4	
12	R2	62	1.0	0.152	10.2	LOS B	0.9	6.4	0.54	0.67	52.1	
Approach		141	1.0	0.152	8.2	LOS A	0.9	6.4	0.54	0.67	51.9	
All Vehicles		981	1.6	0.345	6.6	LOS A	2.5	18.0	0.44	0.57	53.0	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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

MOVEMENT SUMMARY



Site: 101 [Flemington Street with Conygham Street, Glenside]

Forecast - pm peak hour
 Site Category: (None)
 Roundabout

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total	Deg. Satn %	Average Delay sec	Level of Service	95% Back of Queue Vehicles	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h		
South: Conygham Street - southern approach												
1	L2	56	1.0 0.318	5.7	LOS A	2.2	15.5	0.45	0.56	0.45	52.6	
2	T1	267	2.0 0.318	5.8	LOS A	2.2	15.5	0.45	0.56	0.45	53.5	
3	R2	33	1.0 0.318	9.3	LOS A	2.2	15.5	0.45	0.56	0.45	53.2	
Approach		356	1.8 0.318	6.1	LOS A	2.2	15.5	0.45	0.56	0.45	53.3	
East: Windsor Road - eastern approach												
4	L2	34	1.0 0.096	7.7	LOS A	0.5	3.9	0.63	0.68	0.63	51.5	
5	T1	31	1.0 0.096	7.8	LOS A	0.5	3.9	0.63	0.68	0.63	52.4	
6	R2	12	1.0 0.096	11.3	LOS B	0.5	3.9	0.63	0.68	0.63	52.1	
Approach		76	1.0 0.096	8.3	LOS A	0.5	3.9	0.63	0.68	0.63	52.0	
North: Conygham Street - northern approach												
7	L2	13	1.0 0.357	5.3	LOS A	2.7	18.9	0.41	0.55	0.41	52.4	
8	T1	299	2.0 0.357	5.4	LOS A	2.7	18.9	0.41	0.55	0.41	53.2	
9	R2	119	1.0 0.357	9.0	LOS A	2.7	18.9	0.41	0.55	0.41	52.9	
Approach		431	1.7 0.357	6.4	LOS A	2.7	18.9	0.41	0.55	0.41	53.1	
West: Flemington Street -Western approach												
10	L2	67	1.0 0.165	6.6	LOS A	1.0	7.0	0.55	0.67	0.55	51.6	
11	T1	19	1.0 0.165	6.7	LOS A	1.0	7.0	0.55	0.67	0.55	52.4	
12	R2	66	1.0 0.165	10.2	LOS B	1.0	7.0	0.55	0.67	0.55	52.1	
Approach		153	1.0 0.165	8.2	LOS A	1.0	7.0	0.55	0.67	0.55	51.9	
All Vehicles		1015	1.6 0.357	6.7	LOS A	2.7	18.9	0.46	0.58	0.46	52.9	

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).

Roundabout LOS Method: SIDRA Roundabout LOS.

Vehicle movement LOS values are based on average delay per movement.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout Capacity Model: SIDRA Standard.

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

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

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