NORTH SILVERDALE PLANNING PROPOSAL
TRAFFIC IMPACT ASSESSMENT

FOR

SILVERDALE
LANDOWNERS GROUP

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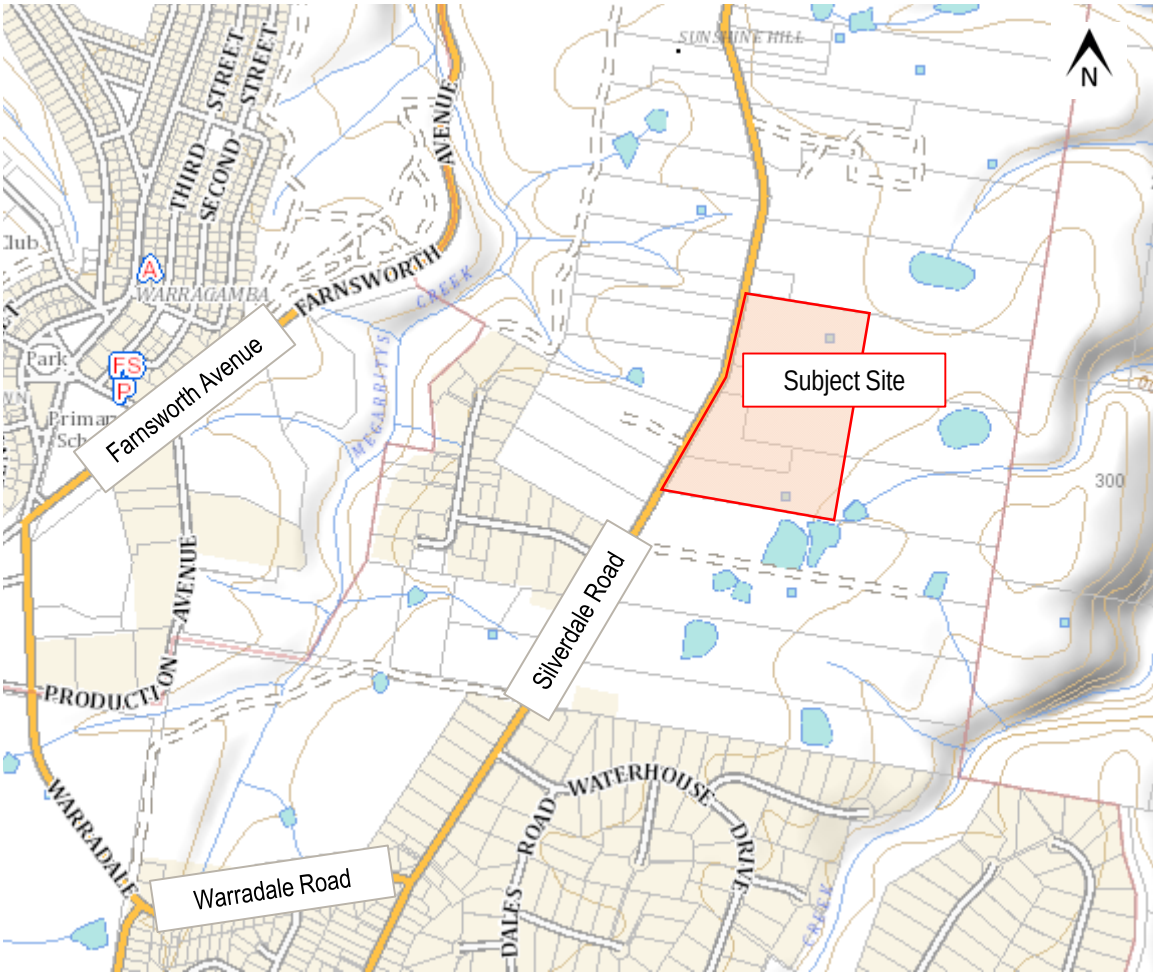
1. INTRODUCTION

1.1 BACKGROUND

Bitzios Consulting has been engaged by Silverdale Landowners Group to prepare a response to Council's Request For Information (RFI) for the proposed North Silverdale Planning Proposal at Silverdale Road, Silverdale. The site locality is shown in Figure 1.1.



Source: NSW Government SIX Maps

Figure 1.1: Development Site Location

1.2 INFORMATION REQUEST

Wollondilly Shire Council's (WSC) request for additional information (RFI) for the above development (dated 30th May 2016) contains the following traffic related items:

> ***Traffic and Transport***
>
> *An updated Traffic Impact Assessment to include all recent approvals & applications that contribute the traffic on Silverdale Road. In particular, this would need to include:*
>
> - *The Warradale Road Subdivisions (93 additional lots);*
> - *The African Lion Safari Park Subdivision (507 lots);*
> - *Silverdale St Heliers Road (165 lots).*
>
> *SIDRA Analysis should also be included with the updated Traffic Impact Assessment.*

1.3 SCOPE

The scope of this assessment included:

- an estimation of development's increase in traffic generation and the distribution onto the external road network, including traffic generation for surrounding developments as requested by Council;
- assessment of the development's traffic impacts on the surrounding road network (including SIDRA Silverdale Road / Warradale Road intersection for the 10-year design horizon);

2. TRAFFIC GENERATION

2.1 SURROUNDING ROAD NETWORK

The surrounding road network is summarised in Table 2.1.

Table 2.1 Road Network

Road Name	Classification	Number of Lanes	Divided	Posted Speed	Comments
Silverdale Road	Regional	2	No	60 km/h	Industrial and commercial developments located on this road.
Farnsworth Avenue	Local	2	No	60 km/h	Northern access road to residential areas to the west.
Warradale Road	Local	2	No	50 km/h (Not Posted)	Link between west-east residential areas.
Marsh Road	Local	2	No	50 km/h	Southern access road for residential areas to the north-west. Borders the old Safari Lion Park site.

2.2 BACKGROUND TRAFFIC VOLUMES

2.2.1 Existing Traffic Volumes

Background traffic volumes for the surrounding road network were obtained from the 2016 TRACKS model. Localised traffic distributions were obtained from intersection count data sourced from the previous Traffic Report undertaken by Colston Budd Hunt & Kafes Pty Ltd. The 2016 background traffic volumes are presented in Figure 2.1.

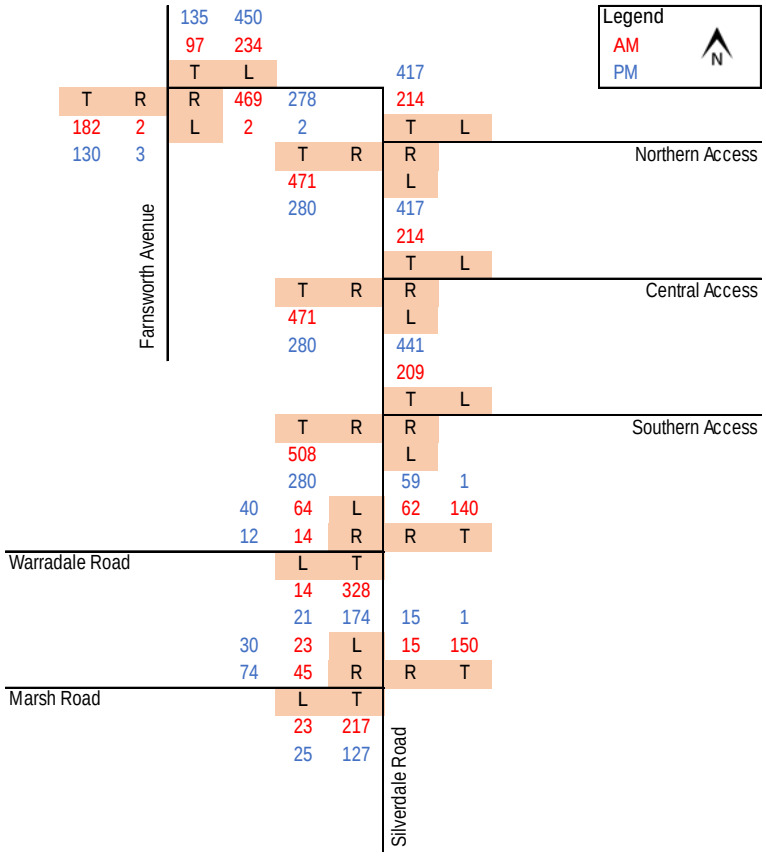


Figure 2.1: 2016 Background Traffic Volumes

2.2.2 Forecast Traffic Volumes

TDG were responsible for the updates completed on the 2016 TRACKS model to incorporate future development in Silverdale. Based on their advice, a compounding growth rate of 3% per annum was adopted to conservatively estimate the increase in background traffic at the 10-year design horizon (2028). The 2028 forecast background traffic volumes are presented in Figure 2.2.

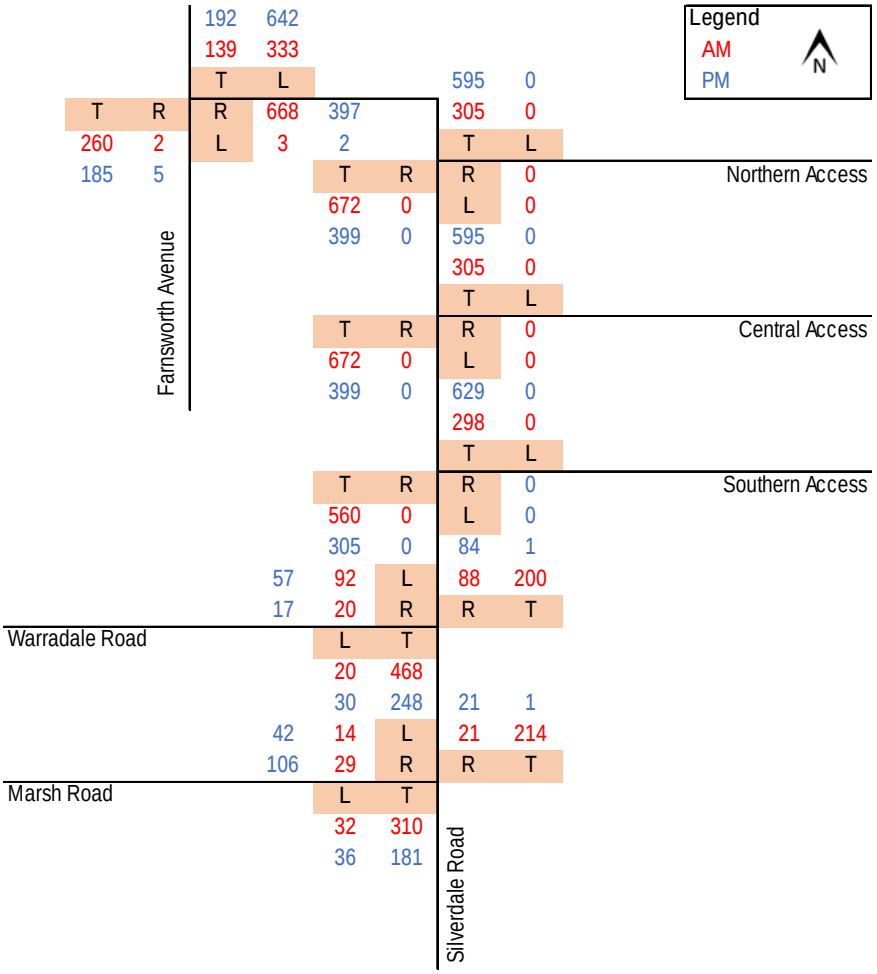


Figure 2.2: 2028 Forecast Background Traffic Volumes

2.3 DEVELOPMENT GENERATED TRAFFIC

While it is unknown precisely what developments are planned for the North Silverdale Road development, it is expected to be a mixture of retail, medium density residential and low density residential land uses, in addition to the planned shopping centre development (known as Stage B2). For the purposes of this assessment, the land uses quantities adopted for the 2016 TRACKS model were used to calculate the estimated traffic generation.

Development traffic was generated using rates prescribed in the RMS (formally RTA) Guide to Traffic Generating Developments (2002) and are listed below:

- Shopping Centre 7.5 trips per 100m^2 GFA
- Residential Units 0.65 trips per unit
- Residential Dwellings 0.85 trips per dwelling

The development's estimated traffic generation is summarised in Table 2.2.

Table 2.2 Estimated Traffic Generation

Land Use	Quantity	Trip rate	Total Trips (veh/hr)
Shopping Centre	8,770m^2	7.5 trips per 100m^2	658
Residential Units	100 units	0.65 trips per unit	65
Residential Dwellings	350 dwellings	0.85 trips per dwelling	298
		Total	*1,020*

As shown in Table 2.2, a total of 1,020 trips are expected to be generated as a result of the development. The traffic has been divided into two categories (residential and retail) as each category of land use has different traffic splits. The IN:OUT traffic splits are detailed in Table 2.3.

Table 2.3 Development Traffic IN:OUT Splits

Distribution	Trips	AM		PM		AM		PM	
		IN(%)	OUT(%)	IN(%)	OUT(%)	IN	OUT	IN	OUT
Retail	658	60%	40%	40%	60%	395	263	263	395
Residential	363	20%	80%	80%	20%	73	290	290	73

As shown in Table 2.3, typical traffic splits 80% / 20% and 60% / 40% were adopted for the traffic analysis.

Separate distributions were adopted to determine the impacts of retail and residential land uses, with the distributions illustrated in Figure 2.3 and Figure 2.4 respectively. It was assumed that for the retail land use, 50% of trips would arrive from / depart to the north and 50% of trips would arrive from / depart to the south. For the residential land use, it was assumed 83% of trips would arrive from / depart to the north and 17% of trips would arrive from / depart to the south.

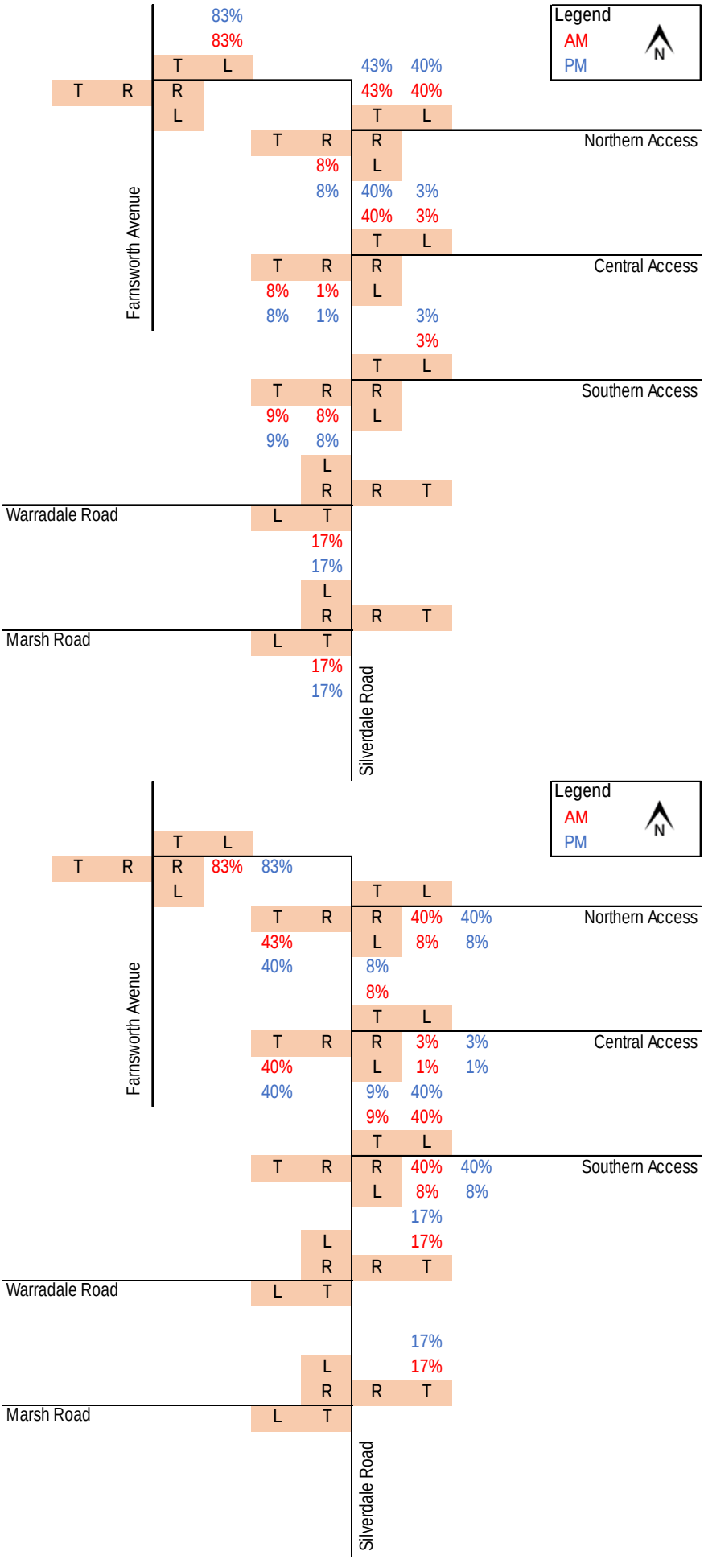


Figure 2.3: Development Traffic Distribution –Retail IN (top) and OUT (bottom)

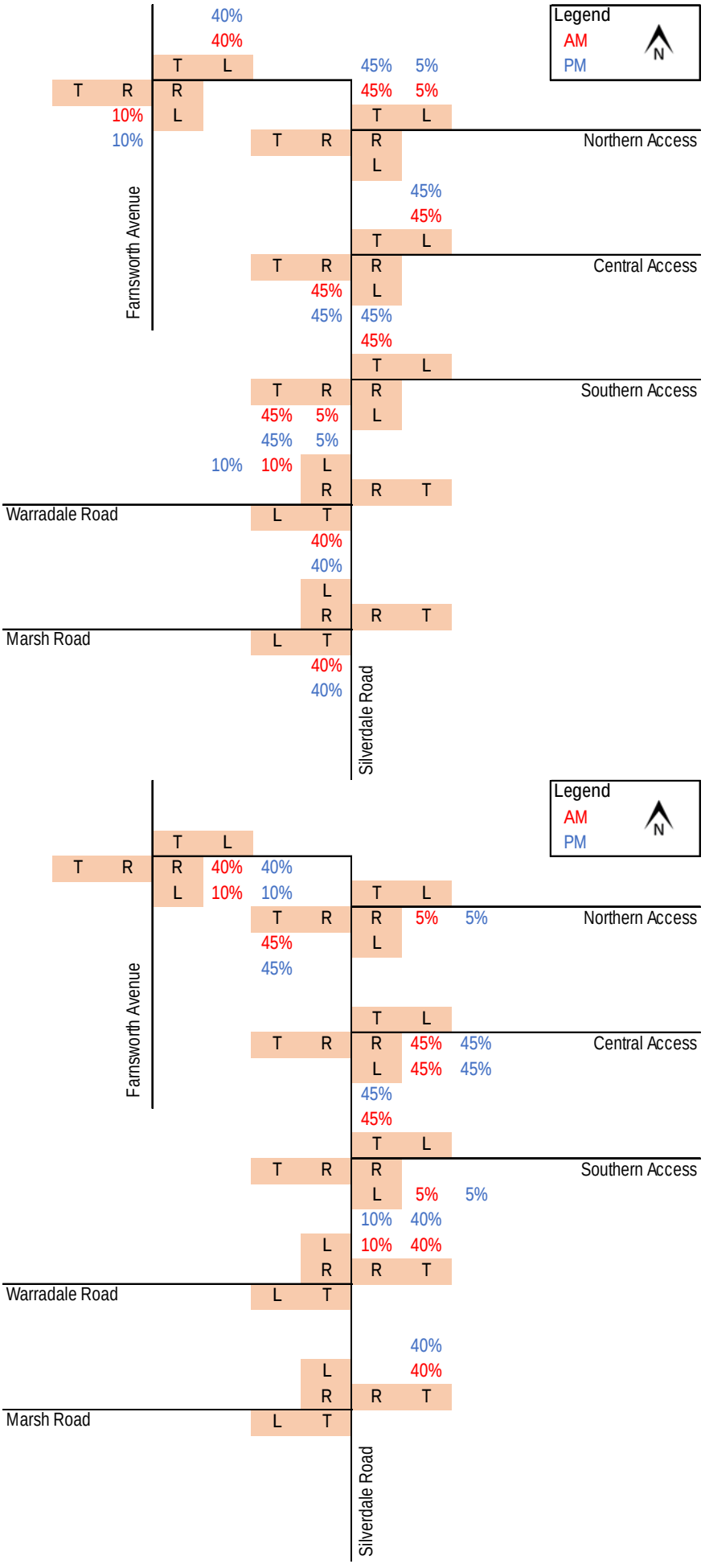


Figure 2.4: Development Traffic Distribution –Residential IN (top) and OUT (bottom)

Based upon the above information, the development traffic was calculated as shown in Figure 2.5

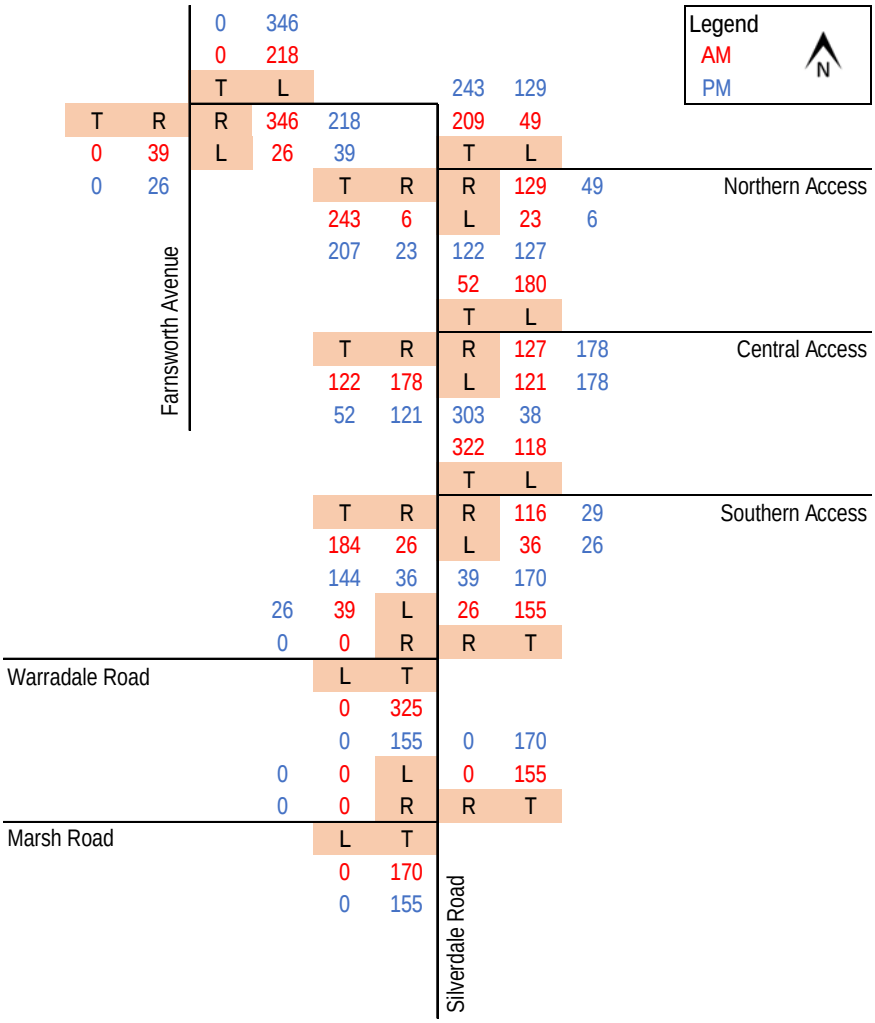


Figure 2.5: Development Traffic Assignment

2.4 SURROUNDING DEVELOPMENT TRAFFIC

In accordance with Council's RFI, other developments in proximity were considered as part of the traffic assessment. The following developments were considered:

- the Warradale Road Subdivision (additional 93 lots);
- the African Lion Safari Park Subdivision (507 lots); and
- Silverdale St Heliers Road (165 lots).

Based upon the distribution of traffic from the previous Traffic Report undertaken by Colston Budd Hunt & Kafes Pty Ltd traffic counts (undertaken in 2011) and the updated TRACKS model by TDG, the surrounding development traffic was calculated and is presented in Figure 2.6.

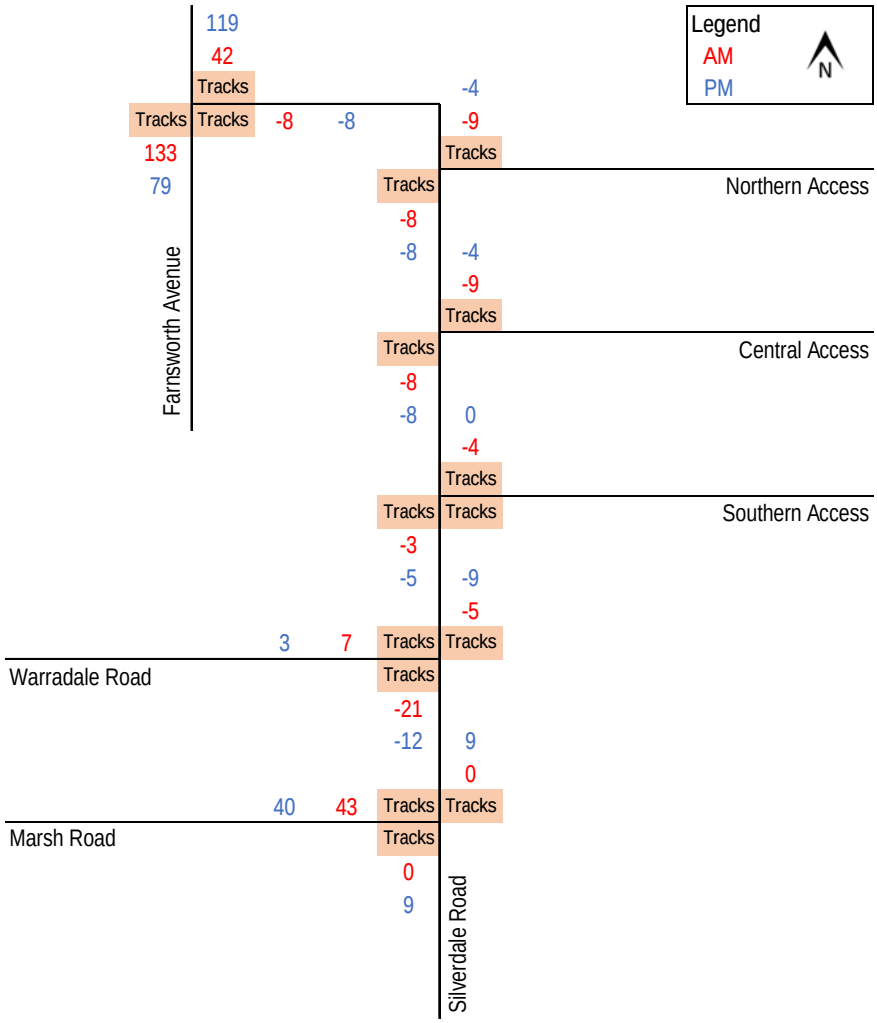


Figure 2.6: Surrounding Development Traffic Volumes

The negative traffic volumes indicate that due to the rerouting of vehicles within the surrounding road network, the other developments reduce vehicles at this location. The volume of traffic from surrounding future developments was calculated using the differences in link volumes between the base (2016) link volumes and base + other development (2016) link volumes.

2.5 DESIGN TRAFFIC VOLUMES

The design traffic volumes were calculated by combining the following traffic volumes:

- forecast background traffic volumes (10-year design horizon, 2028);
- surrounding development traffic; and
- development traffic.

The design traffic volumes are summarised in Figure 2.7.

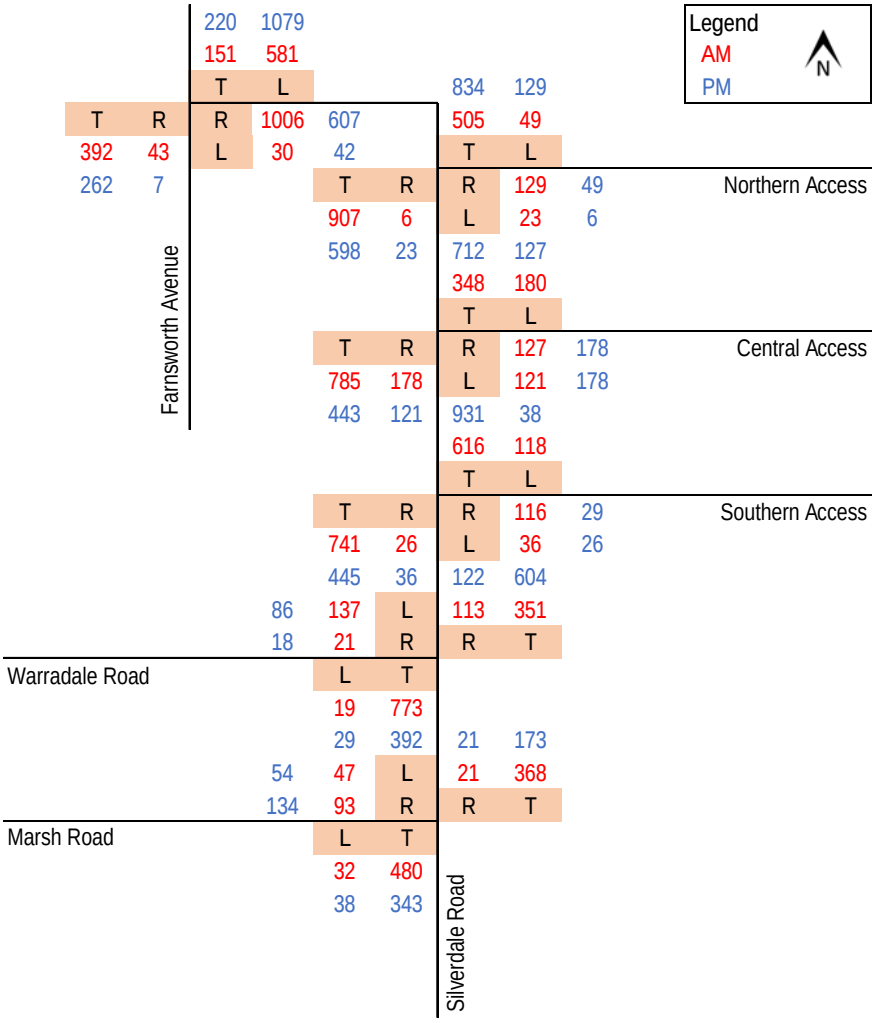


Figure 2.7: 2028 Design Traffic Volumes

3. DETAILED TRAFFIC ANALYSIS

The following assessment is based on the information available at the time, including both proposed land uses associated with this rezoning application and information contained within Council's strategic traffic model. The below assessment provides potential solutions to address traffic impacts identified however may not necessarily be the preferred solution. Further detailed assessment is required to be undertaken once each stage of the development is better known and more detailed information becomes available.

The following provides a level of assessment that is considered to be suitable to provide sufficient justification that the proposed rezoning could occur and that mitigation measures were available to offset any impacts identified.

The following intersections were analysed with SIDRA Intersection Analysis 7 to determine if any remedial works should be considered as a result of the proposed development:

- Silverdale Road / Farnsworth Avenue Roundabout;
- Silverdale Road / Northern Access Road (to Development);
- Silverdale Road / Central Access Road (to Development);
- Silverdale Road / Southern Access Road (to Development);
- Silverdale Road / Warradale Road; and
- Silverdale Road / Marsh Road.

3.1 SILVERDALE ROAD / FARNSWORTH AVENUE

The Silverdale Road / Farnsworth Avenue roundabout is presently located to the north of the proposed development with the major traffic route being from the north – east through the roundabout. The existing layout is shown below in Figure 3.1.

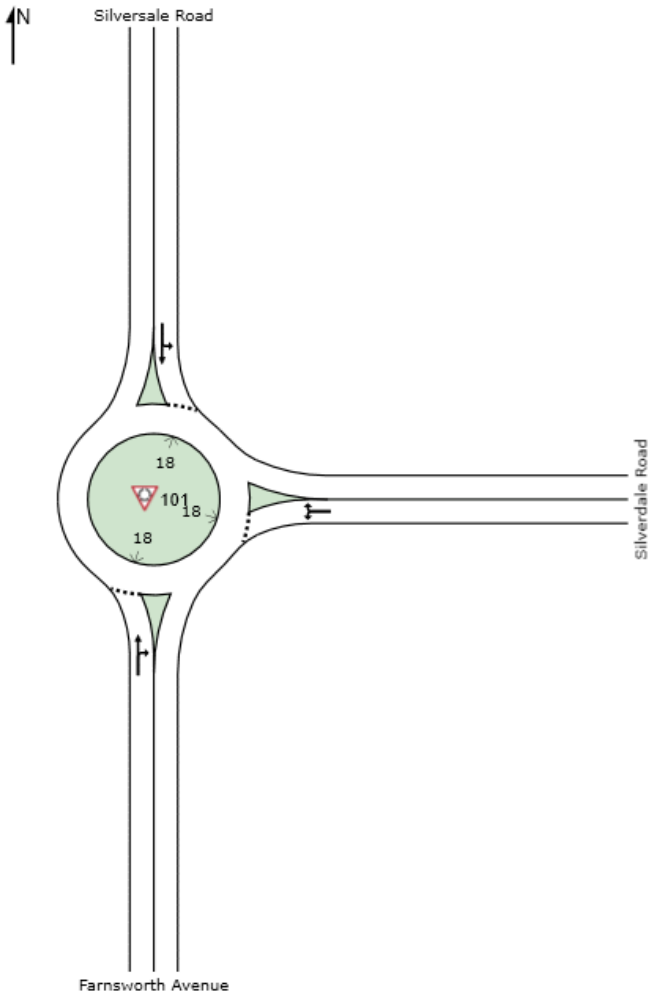


Figure 3.1: Silverdale Road / Farnsworth Avenue Roundabout Geometric Layout

The results of the SIDRA analysis are presented in Table 3.1.

Table 3.1: Silverdale Road / Farnsworth Avenue Roundabout – 2028 Design Summary

Peak Period	AM			PM		
	DOS	Average Delay (s)	95% Back of Queue (m)	DOS	Average Delay (s)	95% Back of Queue (m)
Farnsworth Avenue (South)	1.294	312.4	600.1	0.393	9.0	20.1
Silverdale Road (East)	0.851	12.5	109.6	0.592	10.4	35.9
Silverdale Road (North)	0.509	4.3	39.7	0.817	4.2	154.6

As shown in Table 3.1, the Silverdale Road / Farnsworth Avenue roundabout will not be able to accommodate the estimated design traffic. Capacity issues relate to the following:

- 'natural' increase in background traffic;
- surrounding developments (primarily residential);
- the proposed development (residential and retail); and
- Silverdale Road forming a 'spine' road with the northern and eastern legs part of the major route. Therefore, approaches from the south or east would be expected to have increased delays due to giving way to vehicles on the roundabout.

To alleviate future capacity issues at this intersection, a conversion to a signalised intersection should provide acceptable LOS. Additionally, realignment of Silverdale Road to be the north and southern legs of the intersection would be recommended.

3.2 SILVERDALE ROAD / NORTHERN ACCESS ROAD

The Northern Access Road provides access to the north-most residential precincts. It is expected that there will be less traffic through this intersection with Silverdale Road compared to the Silverdale Road / Central Access Road intersection. A typical priority-controlled intersection was modelled however it was found that there was insufficient capacity for vehicles turning right onto Silverdale Road (i.e. leaving the development to travel north). Therefore, to accommodate this movement, a roundabout is recommended noting that changes may be required once detailed plans and yields are available for the surrounding parts of the development. The proposed layout is shown below in Figure 3.2.

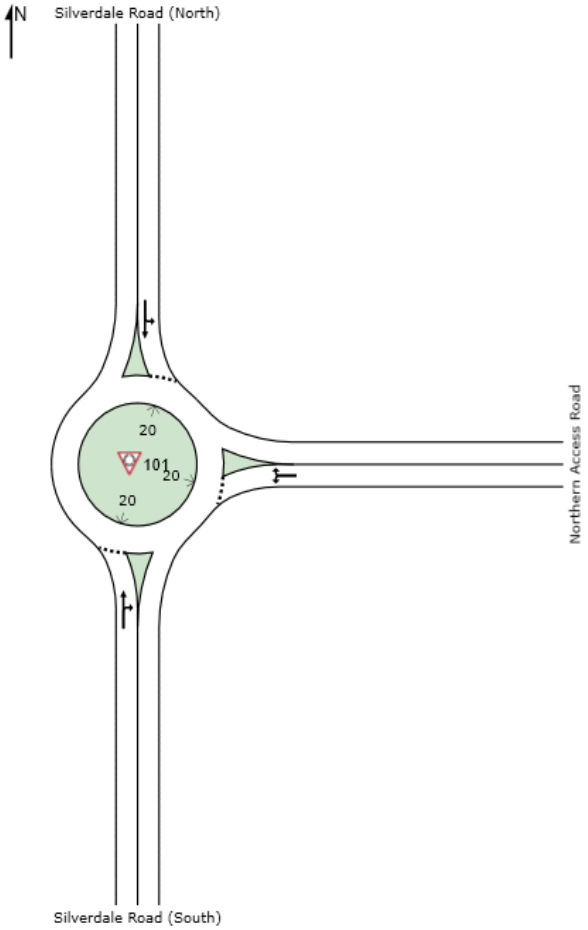


Figure 3.2: Silverdale Road / Northern Access Road Intersection Geometric Layout

The results of the SIDRA analysis are presented in Table 3.2.

Table 3.2: Silverdale Road / Northern Access Road Intersection SIDRA Results Summary

Peak Period	AM			PM		
	DOS	Average Delay (s)	95% Back of Queue (m)	DOS	Average Delay (s)	95% Back of Queue (m)
Silverdale Road (South)	0.714	5.5	59.9	0.436	4.6	26.9
Northern Access Road (East)	0.171	10.9	6.6	0.085	13.9	3.6
Silverdale Road (North)	0.342	4.1	19.1	0.618	4.3	46.0

As shown in Table 3.2, a single lane roundabout should be sufficient to accommodate traffic at the proposed Silverdale Road / Northern Access Road intersection.

3.3 SILVERDALE ROAD / CENTRAL ACCESS ROAD

The development plans show that a 'seagull' treatment has been shown for this intersection. This was modelled using the network feature of SIDRA whereby two give way intersections are combined to model a single intersection. The proposed layout is shown below in Figure 3.3.

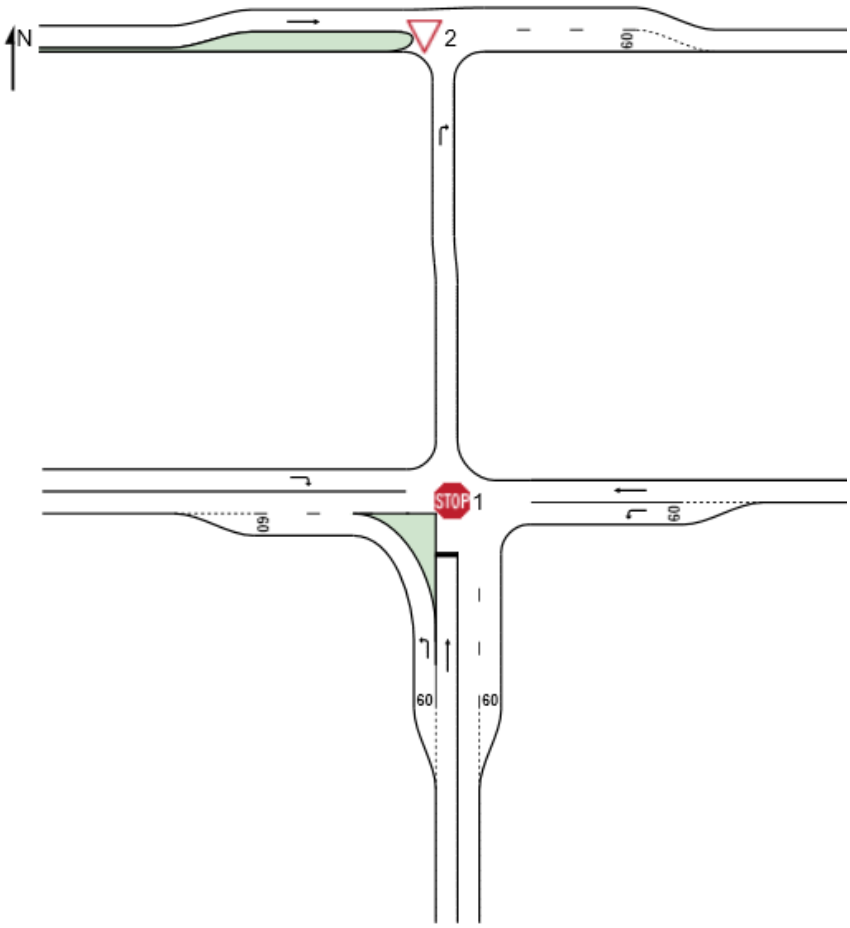


Figure 3.3: Silverdale Road / Central Access Road Intersection Geometric Layout

The results of the SIDRA analysis are presented in Table 3.3.

Table 3.3: Silverdale Road / Central Access Road Intersection SIDRA Results Summary

Peak Period	AM			PM		
	DOS	Average Delay (s)	95% Back of Queue (m)	DOS	Average Delay (s)	95% Back of Queue (m)
Central Access Road (East)	0.281	10.1	8.0	0.543	12.3	25.8
Silverdale Road (North)	0.188	1.9	0.0	0.384	0.9	0.0
Silverdale Road (South)	0.245	9.0	7.5	0.282	13.9	2.7

Given the volume of vehicles travelling south on Silverdale Road, it is apparent that there are few gaps for vehicles to exit from the development as indicated by the short queue length and high delay. Additionally, there may be safety issues relating to sight distance for vehicles on the eastern approach and queuing issues for vehicles from the south.

Based on the above, a signalised intersection would be recommended as shown below in Figure 3.4 noting the duplication of lanes on Silverdale Road.

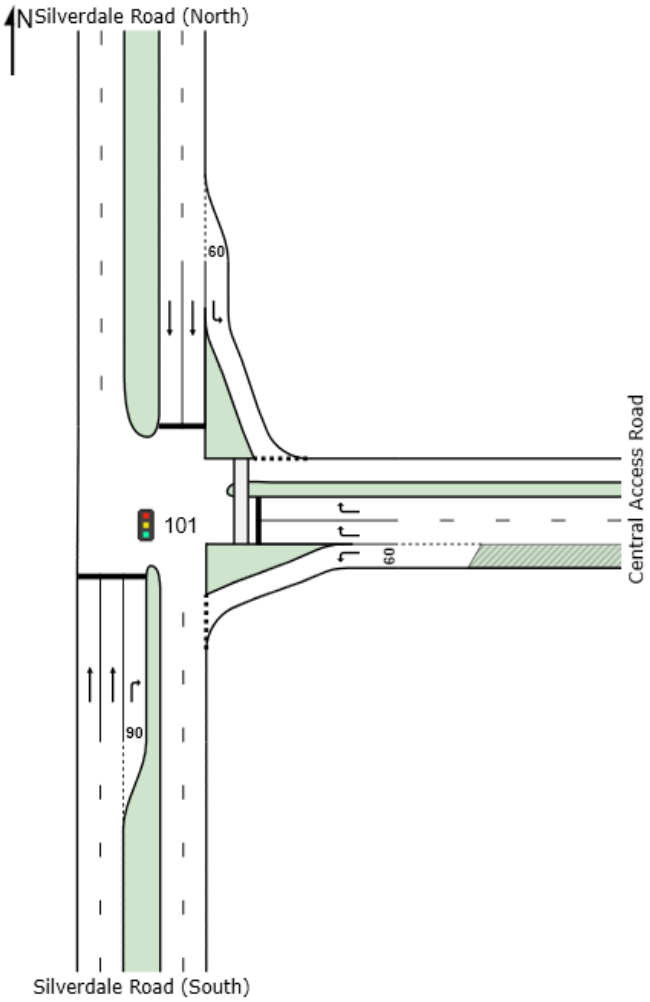


Figure 3.4: Silverdale Road / Central Access Road Intersection Geometric Layout

The results of the SIDRA analysis are presented in Table 3.4

Table 3.4: Silverdale Road / Central Access Road Intersection SIDRA Results Summary

Peak Period	AM			PM		
	DOS	Average Delay (s)	95% Back of Queue (m)	DOS	Average Delay (s)	95% Back of Queue (m)
Silverdale Road (South)	0.294	5.1	42.6	0.300	6.8	25.1
Central Access Road (East)	0.294	26.5	19.5	0.303	24.5	26.0
Silverdale Road (North)	0.167	4.6	16.3	0.283	5.6	44.2

As shown in Table 3.4, the signalised intersection as illustrated in Figure 3.3 has substantial available capacity with DOS, delays and queue lengths well within acceptable limits.

3.4 SILVERDALE ROAD / SOUTHERN ACCESS ROAD

The southern access is expected to have similar traffic volumes as the Northern Access Road, therefore, the same single lane roundabout is recommended as shown in Figure 3.5.

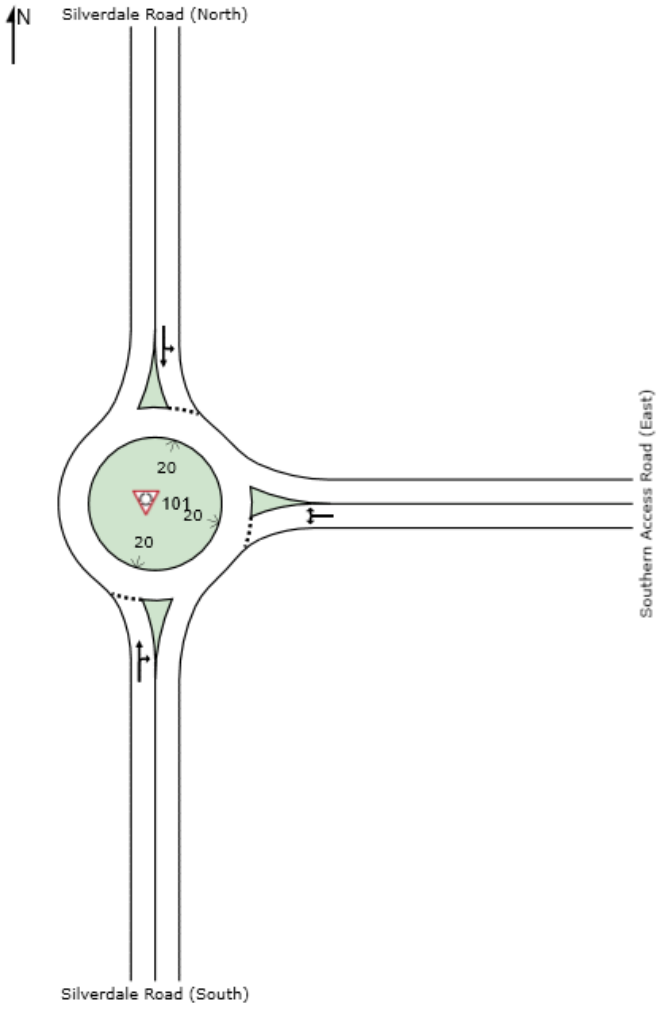


Figure 3.5: Silverdale Road / Southern Access Road Intersection Geometric Layout

The results of the SIDRA analysis are presented in Table 3.5.

Table 3.5: Silverdale Road / Southern Access Road Intersection SIDRA Results Summary

Peak Period	AM			PM		
	DOS	Average Delay (s)	95% Back of Queue (m)	DOS	Average Delay (s)	95% Back of Queue (m)
Silverdale Road (South)	0.612	5.3	46.3	0.334	4.7	26.0
Southern Access Road (East)	0.193	11.6	8.0	0.100	19.1	9.5
Silverdale Road (North)	0.494	4.3	33.4	0.658	4.9	100.7

Is it noted that the flow of traffic is tidal along Silverdale Road, as described in the traffic distributions. This is again shown in the higher DOS value for the southern and northern approaches for the AM and PM respectively.

3.5 SILVERDALE ROAD / WARRADALE ROAD

The Silverdale Road / Warradale Road intersection is a priority-controlled T-intersection with medians dividing opposing lanes on all legs. The layout is shown in Figure 3.6.

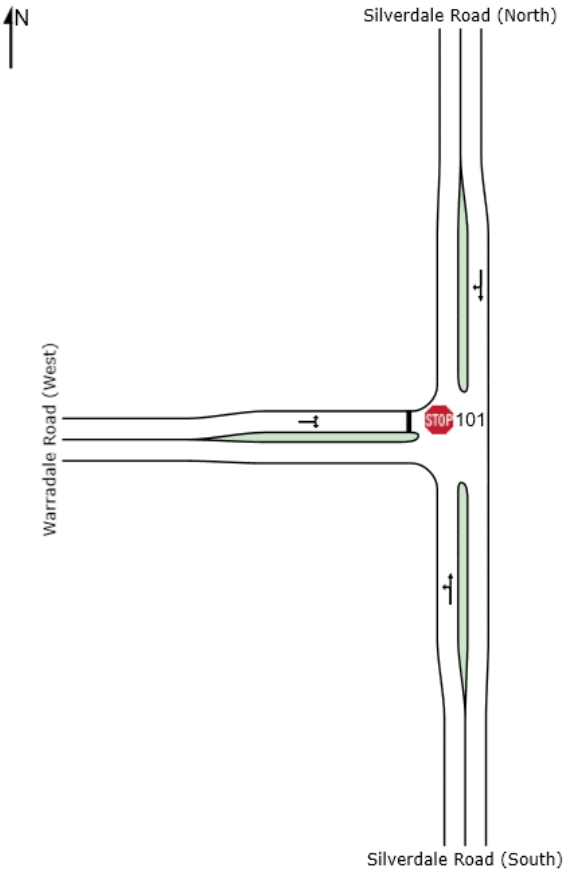


Figure 3.6: Silverdale Road / Warradale Road Intersection Geometric Layout

The results of the SIDRA analysis are presented in Table 3.6.

Table 3.6: Silverdale Road / Warradale Road Intersection SIDRA Results Summary

Peak Period	AM			PM		
	DOS	Average Delay (s)	95% Back of Queue (m)	DOS	Average Delay (s)	95% Back of Queue (m)
Silverdale Road (South)	0.442	0.2	0.0	0.236	0.4	0.0
Silverdale Road (North)	0.428	7.6	25.9	0.456	2.5	17.2
Warradale Road (West)	0.473	21.5	15.1	0.198	13.1	5.1

As shown Table 3.6, no mitigation measures are required as the existing intersection layout is sufficient to accommodate the increase in traffic due to considered developments.

3.6 SILVERDALE ROAD / MARSH ROAD

The Silverdale Road / Marsh Road intersection is a priority-controlled T-intersection with medians dividing opposing lanes on all legs. No increase in turn volumes are expected as a result of the development, however it is expected that there will be an increase in through volumes. As development on greenfield sites occurs further south, it would be expected that this intersection would need to be upgraded at that time. The layout of the intersection is shown in Figure 3.7.

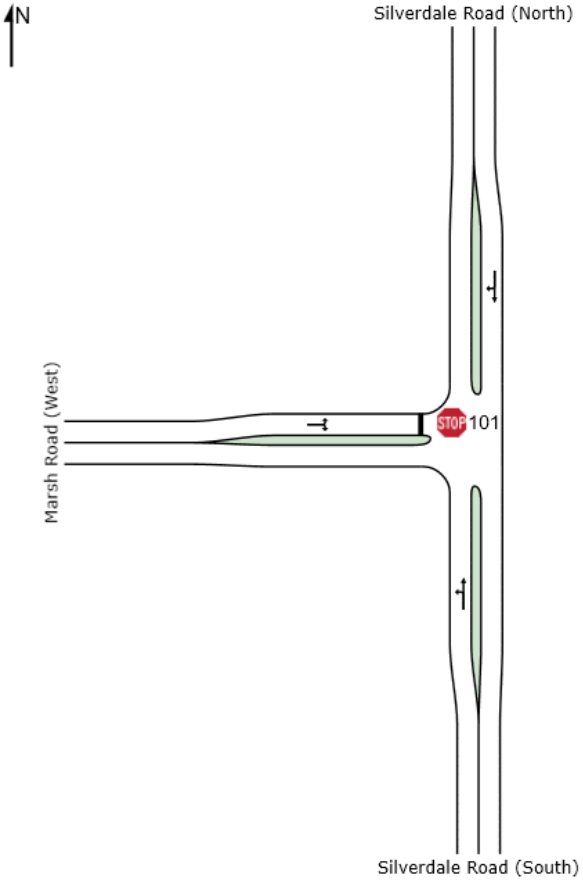


Figure 3.7: Silverdale Road / Marsh Road Intersection Geometric Layout

The results of the SIDRA analysis are presented in Table 3.7.

Table 3.7: Silverdale Road / Marsh Road Intersection SIDRA Results Summary

Peak Period	AM			PM		
	DOS	Average Delay (s)	95% Back of Queue (m)	DOS	Average Delay (s)	95% Back of Queue (m)
Silverdale Road (South)	0.286	0.4	0.0	0.213	0.6	0.0
Silverdale Road (North)	0.228	0.8	2.2	0.116	1.1	1.6
Marsh Road (West)	0.331	15.7	9.2	0.293	11.6	8.5

As shown in Table 3.7, no mitigation measures are required as the existing intersection layout is sufficient to accommodate the increase in traffic due to considered developments.

4. CONCLUSION

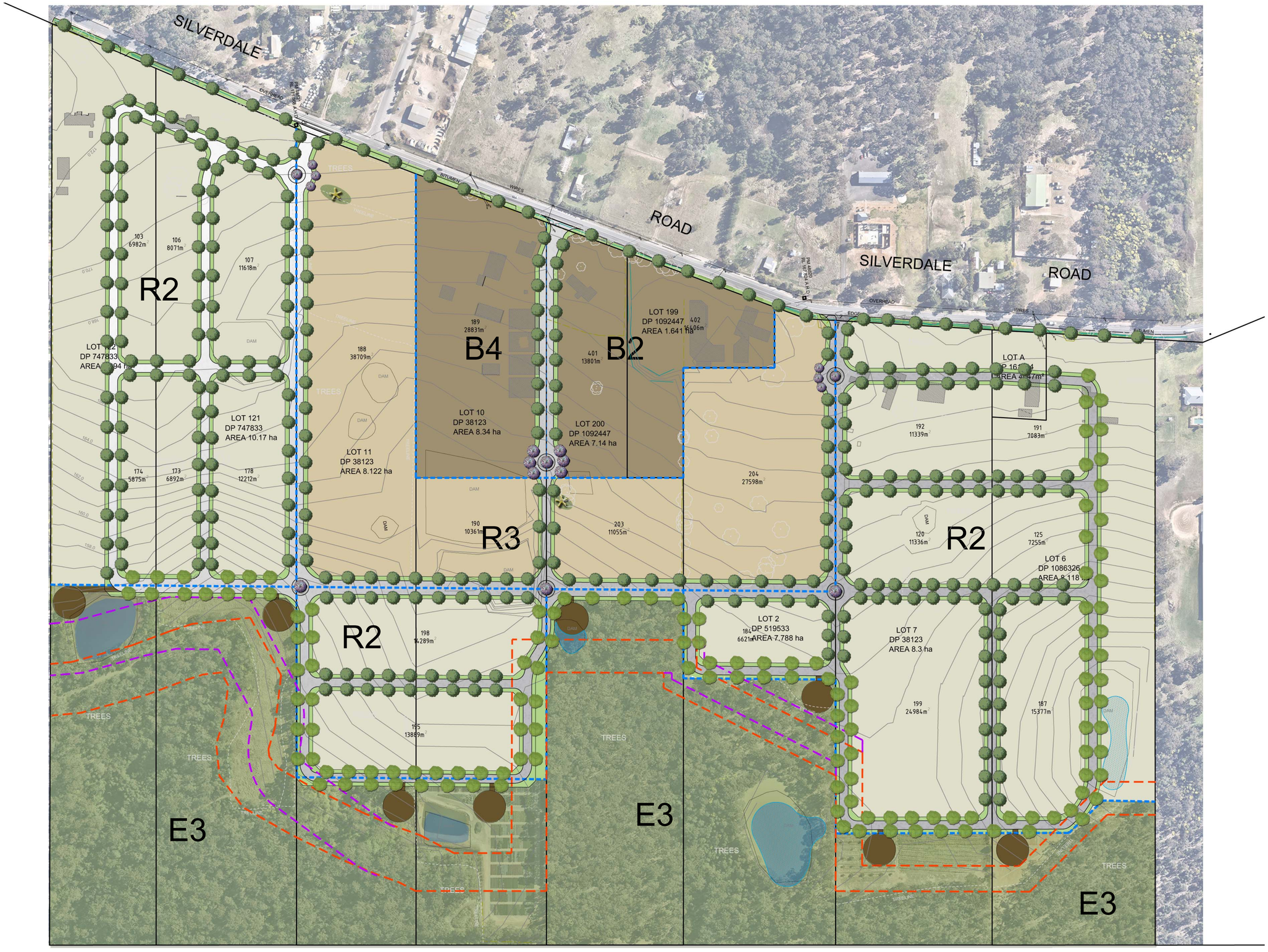
The key findings from the traffic impact assessment for the proposed North Silverdale retail development are as follows:

- the Silverdale Road / Farnsworth Avenue intersection will need to be upgraded to a signalised intersection to accommodate the increase in traffic from the proposed and surrounding developments;
- single lane roundabouts are proposed for the Northern and Southern Access Roads into the proposed development on Silverdale Road;
- the 'seagull' treatment as shown for the Silverdale Road / Central Access Road intersection is insufficient to accommodate development traffic. A signalised intersection is proposed to accommodate development traffic and provide acceptable levels of service;
- no mitigation measures are required at the Silverdale Road / Warradale Road intersection; and
- no mitigation measures are required at the Silverdale Road / Marsh Road intersection.

This traffic assessment provides indicative assessment of potential solutions based on information available at the time, including both proposed land uses associated with this rezoning application and the TRACKS model provided by Council. The level of assessment undertaken is considered suitable to provide justification that the proposed rezoning could occur and that mitigation measures are available to offset any identified impacts. A more detailed analysis of intersection treatments and assessment of the traffic impacts of surrounding developments will be required to be undertaken with accompanying development applications for developments inside the rezoned area on Silverdale Road.

APPENDIX A

DEVELOPMENT PLANS



LEGEND

- R2 ZONE
- R3 ZONE
- B2 Zone
- B4 Zone
- E3 Zone
- PREVIOUS LINE OF APZ
- NEW LINE OF APZ
- ZONING BOUNDARY
- POSSIBLE BUILDING LOCATION
- EXISTING DAM
- STREET TREE
- STREET TREE (FIRE RETARDANT SPECIES WITHIN APZ)
- FEATURE TREE
- PARK / LANDSCAPING TO PROTECT GREVILLEA JUNIPERINA SUBSP. JUNIPERINA (VULNERABLE TSC ACT.). REFER BIOSIS.

SITE PLAN
1:1750

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issue	issue date	issue description	des	dwn	app
A	27.01.16	client information	VM	KM	VM

scale	project	dwg title	
AS SHOWN AT A1	NORTH SILVERDALE PLANNING PROPOSAL SILVERDALE ROAD, SILVERDALE	OVERALL LAYOUT	
date	client:	dwg no.	project no.
14.03.2016	NORTH SILVERDALE LANDOWNER GROUP	P01/05	16148

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DRAWING TITLE: MASTERPLAN STAGE 1		
PROJECT NAME: PROPOSED RETAIL DEVELOPMENT SILVERDALE ROAD, SILVERDALE	CLIENT NAME: BRUNO LOPREIATO	
PROJECT NUMBER: 10205502	SCALE: 1:500@A1/1:1000&A3	DRAWING NUMBER: A1001
DATE: 13/09/2011	REVISION NUMBER: F	

APPENDIX B

TRACKS MODEL OUTPUTS

2016 Camden & Wollondilly Model – Base Network
Volume Plot – Morning Peak

1

2016 Camden & Wollondilly Model – Base Network
Volume Plot – Evening Peak

TDG

2

2016 Camden & Wollondilly Model – ALL Silverdale Developments Together
Volume Plot – Morning Peak

3

2016 Camden & Wollondilly Model – ALL Silverdale Developments Together

Volume Plot – Evening Peak

4

2016 Camden & Wollondilly Model – All Silverdale Developments excl Silverdale Road Development Volume Plot – Morning Peak

TDG

5

2016 Camden & Wollondilly Model – All Silverdale Developments excl Silverdale Road Development

Volume Plot – Evening Peak

6

2016 Camden & Wollondilly Model –Silverdale Road Development Distribution Volume Plot – Morning Peak

7

2016 Camden & Wollondilly Model –Silverdale Road Development Distribution

Volume Plot – Evening Peak

8

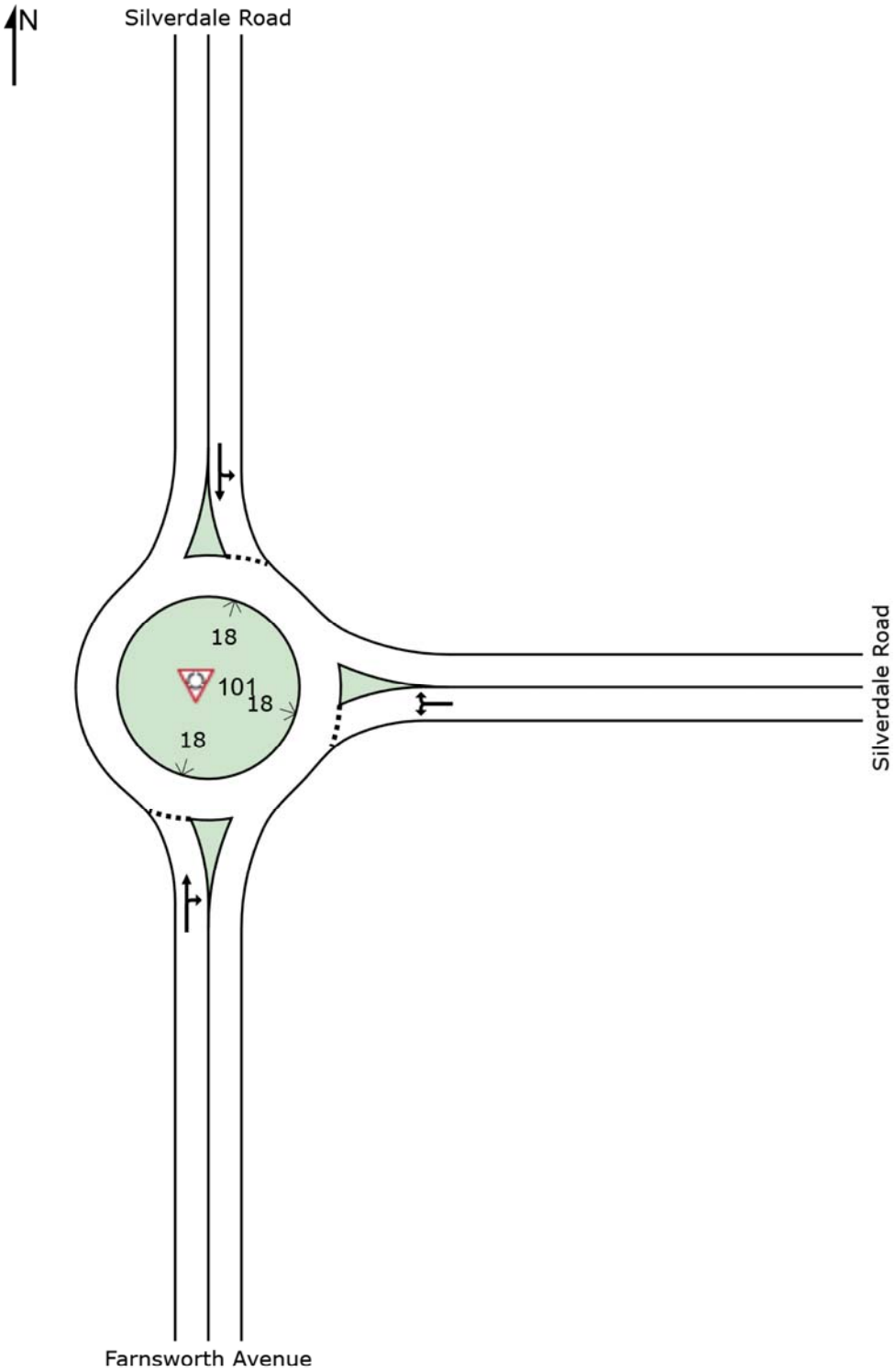
APPENDIX C

SIDRA OUTPUTS

SITE LAYOUT

Site: 101 [2028 DES AM]

Farnsworth Avenue / Silverdale Road Roundabout
Roundabout



MOVEMENT SUMMARY

Site: 101 [2028 DES AM]

Farnsworth Avenue / Silverdale Road Roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Farnsworth Avenue											
2	T1	413	5.0	1.294	311.9	LOS F	82.2	600.1	1.00	3.77	9.9
3	R2	45	5.0	1.294	316.3	LOS F	82.2	600.1	1.00	3.77	9.9
Approach		458	5.0	1.294	312.4	LOS F	82.2	600.1	1.00	3.77	9.9
East: Silverdale Road											
4	L2	32	5.0	0.851	8.0	LOS A	15.0	109.6	0.88	0.69	49.3
6	R2	1059	5.0	0.851	12.6	LOS A	15.0	109.6	0.88	0.69	50.2
Approach		1091	5.0	0.851	12.5	LOS A	15.0	109.6	0.88	0.69	50.2
North: Silverdale Road											
7	L2	612	5.0	0.509	4.3	LOS A	5.4	39.7	0.28	0.44	54.2
8	T1	159	5.0	0.509	4.5	LOS A	5.4	39.7	0.28	0.44	55.6
Approach		771	5.0	0.509	4.3	LOS A	5.4	39.7	0.28	0.44	54.5
All Vehicles		2319	5.0	1.294	69.0	LOS E	82.2	600.1	0.70	1.21	28.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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 [2028 DES PM]

Farnsworth Avenue / Silverdale Road Roundabout
Roundabout

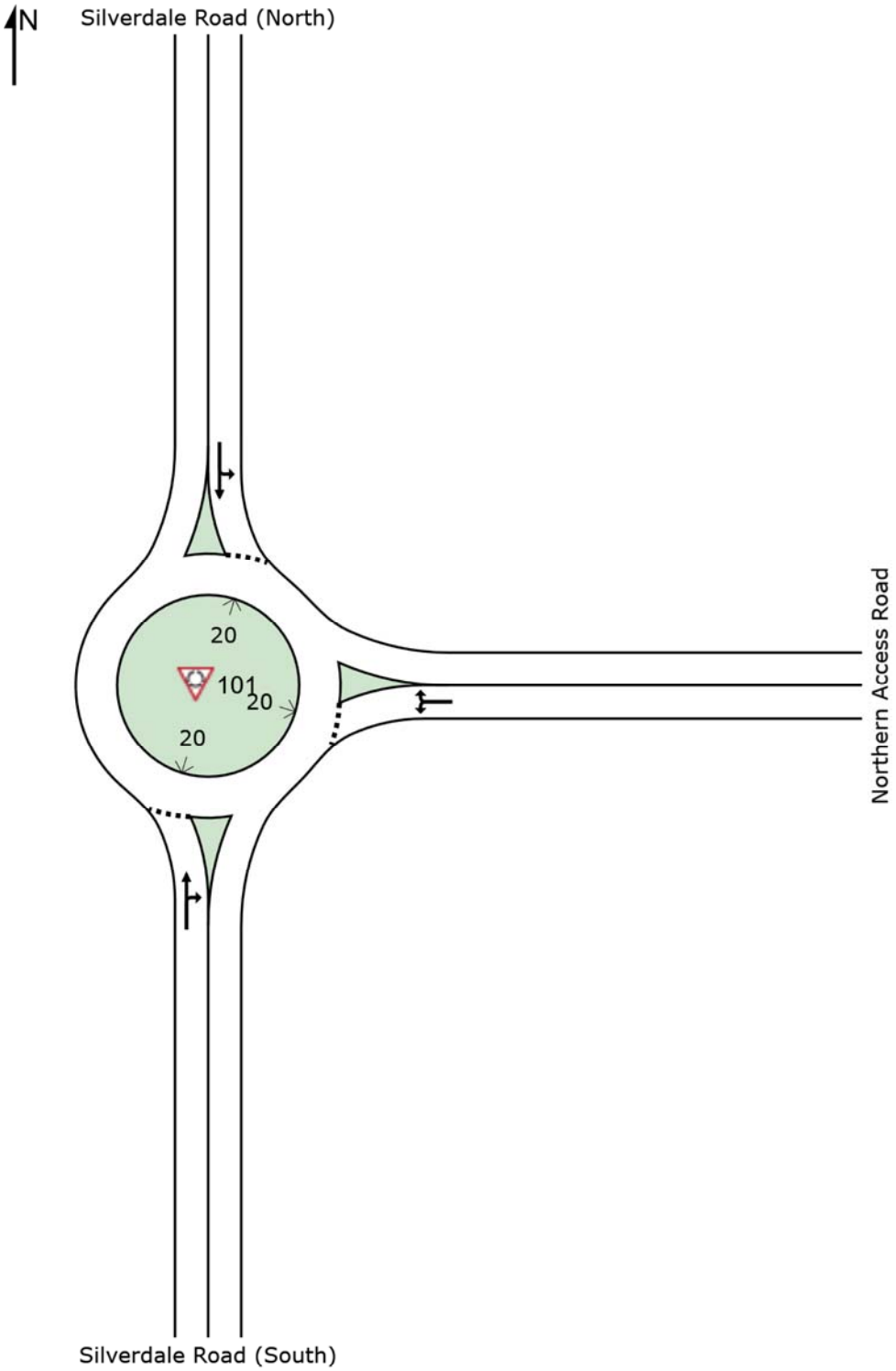
Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Farnsworth Avenue											
2	T1	276	5.0	0.393	8.9	LOS A	2.8	20.1	0.82	0.83	52.6
3	R2	7	5.0	0.393	13.3	LOS A	2.8	20.1	0.82	0.83	52.4
Approach		283	5.0	0.393	9.0	LOS A	2.8	20.1	0.82	0.83	52.6
East: Silverdale Road											
4	L2	44	5.0	0.592	6.0	LOS A	4.9	35.9	0.63	0.70	50.2
6	R2	639	5.0	0.592	10.7	LOS A	4.9	35.9	0.63	0.70	51.2
Approach		683	5.0	0.592	10.4	LOS A	4.9	35.9	0.63	0.70	51.1
North: Silverdale Road											
7	L2	1136	5.0	0.817	4.2	LOS A	21.2	154.6	0.22	0.42	54.5
8	T1	232	5.0	0.817	4.4	LOS A	21.2	154.6	0.22	0.42	55.8
Approach		1367	5.0	0.817	4.2	LOS A	21.2	154.6	0.22	0.42	54.7
All Vehicles		2334	5.0	0.817	6.6	LOS A	21.2	154.6	0.41	0.55	53.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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.

SITE LAYOUT

Site: 101 [2028 DES AM]

Silverdale Road / Northern Access Roundabout
Roundabout



MOVEMENT SUMMARY

Site: 101 [2028 DES AM]

Silverdale Road / Northern Access Roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Silverdale Road (South)											
2	T1	955	0.0	0.714	5.5	LOS A	8.6	59.9	0.65	0.53	53.7
3	R2	6	0.0	0.714	10.1	LOS A	8.6	59.9	0.65	0.53	53.7
Approach		961	0.0	0.714	5.5	LOS A	8.6	59.9	0.65	0.53	53.7
East: Northern Access Road											
4	L2	24	0.0	0.171	6.8	LOS A	0.9	6.6	0.59	0.74	50.5
6	R2	136	0.0	0.171	11.6	LOS A	0.9	6.6	0.59	0.74	51.6
Approach		160	0.0	0.171	10.9	LOS A	0.9	6.6	0.59	0.74	51.5
North: Silverdale Road (North)											
7	L2	52	0.0	0.342	3.9	LOS A	2.7	19.1	0.07	0.40	55.2
8	T1	532	0.0	0.342	4.1	LOS A	2.7	19.1	0.07	0.40	56.6
Approach		583	0.0	0.342	4.1	LOS A	2.7	19.1	0.07	0.40	56.5
All Vehicles		1704	0.0	0.714	5.5	LOS A	8.6	59.9	0.45	0.50	54.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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 [2028 DES PM]

Silverdale Road / Northern Access Roundabout
Roundabout

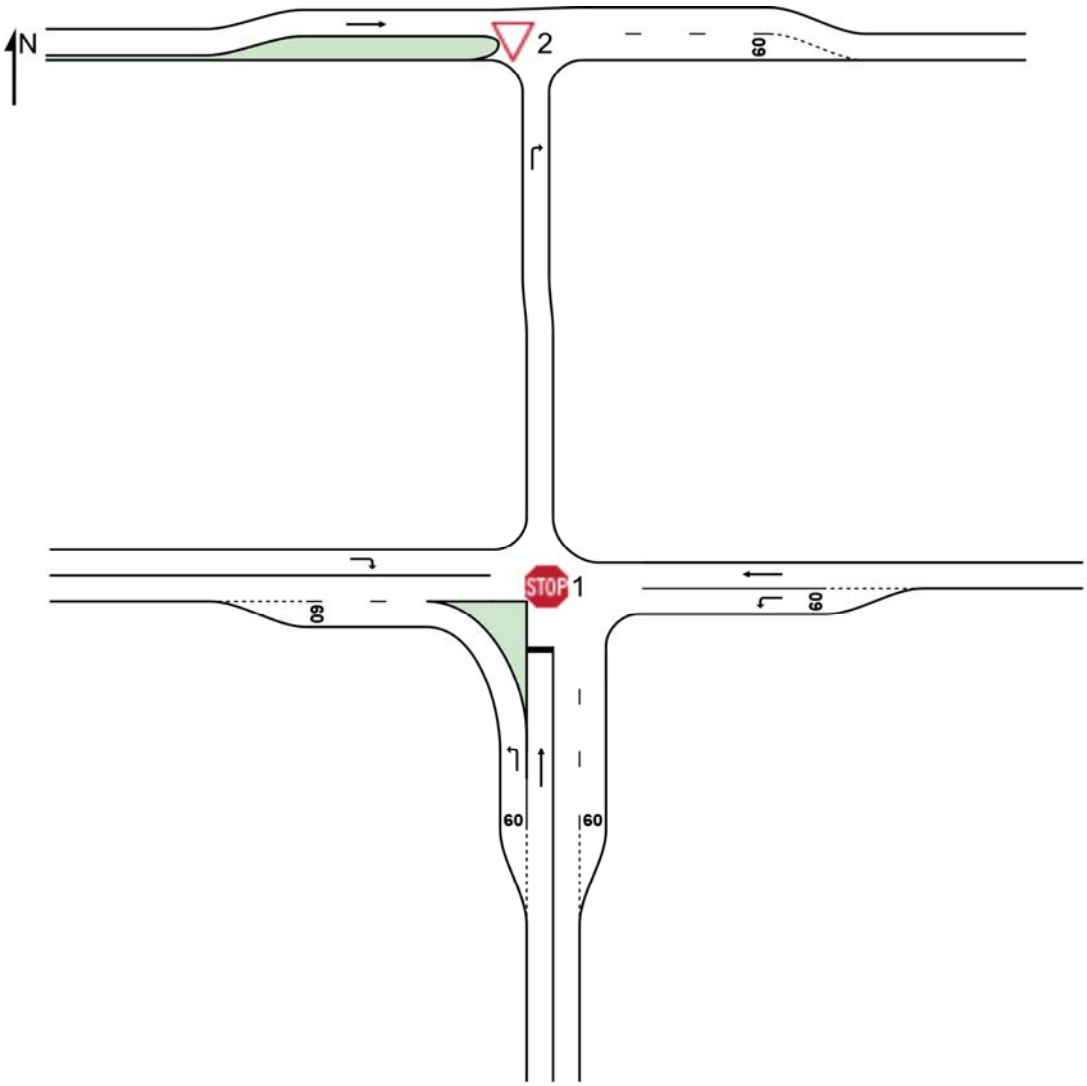
Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Silverdale Road (South)											
2	T1	629	0.0	0.436	4.4	LOS A	3.8	26.9	0.28	0.41	55.4
3	R2	24	0.0	0.436	9.0	LOS A	3.8	26.9	0.28	0.41	55.4
Approach		654	0.0	0.436	4.6	LOS A	3.8	26.9	0.28	0.41	55.4
East: Northern Access Road											
4	L2	6	0.0	0.085	9.6	LOS A	0.5	3.6	0.76	0.78	48.6
6	R2	52	0.0	0.085	14.5	LOS A	0.5	3.6	0.76	0.78	49.6
Approach		58	0.0	0.085	13.9	LOS A	0.5	3.6	0.76	0.78	49.5
North: Silverdale Road (North)											
7	L2	136	0.0	0.618	4.1	LOS A	6.6	46.0	0.21	0.39	54.6
8	T1	878	0.0	0.618	4.3	LOS A	6.6	46.0	0.21	0.39	55.9
Approach		1014	0.0	0.618	4.3	LOS A	6.6	46.0	0.21	0.39	55.8
All Vehicles		1725	0.0	0.618	4.7	LOS A	6.6	46.0	0.25	0.41	55.4

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

NETWORK LAYOUT

Network: N101 [2028 AM]

Silverdale Road / Central Access Priority Controlled Intersection



SITES IN NETWORK	
Site ID	**Site Name**
STOP 1	2028 DES AM Stop 3-way Stage 1 (Minor Road) NSW
▽ 2	2028 DES AM Stop 3-way Stage 2 (Median) NSW

Organisation: BITZIOS CONSULTING | Created: Wednesday, 29 March 2017 10:38:16 AM
Project: C:\Users\joshua\Desktop\P2914 North Silverdale RFI\2914.002M Silverdale Road - Central Access Priority Controlled Intersection.sip7

MOVEMENT SUMMARY

Site: 1 [2028 DES AM Stop 3-way Stage 1 (Minor Road) NSW]

Network: N101 [2028 AM]

Silverdale Road / Central Access Priority Controlled Intersection

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Central Access Road (East)													
1	L2	127	0.0	127	0.0	0.069	5.6	LOS A	0.0	0.0	0.00	0.53	54.9
2	T1	134	0.0	134	0.0	0.268	14.4	LOS A	1.1	8.0	0.65	1.02	42.1
Approach		261	0.0	261	0.0	0.268	10.1	LOS A	1.1	8.0	0.33	0.78	49.8
East: Silverdale Road (North)													
4	L2	189	0.0	189	0.0	0.102	5.6	LOS A	0.0	0.0	0.00	0.58	53.6
5	T1	366	0.0	366	0.0	0.188	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		556	0.0	556	0.0	0.188	1.9	NA	0.0	0.0	0.00	0.20	57.6
West: Silverdale Road (South)													
12	R2	187	5.0	187	5.0	0.245	9.0	LOS A	1.0	7.5	0.57	0.80	50.8
Approach		187	5.0	187	5.0	0.245	9.0	NA	1.0	7.5	0.57	0.80	50.8
All Vehicles		1004	0.9	1004	0.9	0.268	5.4	NA	1.1	8.0	0.19	0.46	54.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 0.0 %
Number of Iterations: 3 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 2 [2028 DES AM Stop 3-way Stage 2 (Median) NSW]

Network: N101 [2028 AM]

Silverdale Road / Central Access Priority Controlled Intersection

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Median Storage Area													
3	R2	134	0.0	134	0.0	0.013	0.0	LOS A	0.0	0.0	0.00	0.00	20.0
Approach		134	0.0	134	0.0	0.013	0.0	NA	0.0	0.0	0.00	0.00	20.0
West: Silverdale Road (South)													
11	T1	826	0.0	826	0.0	0.424	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		826	0.0	826	0.0	0.424	0.1	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		960	0.0	960	0.0	0.424	0.1	NA	0.0	0.0	0.00	0.00	52.0

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.
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.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 0.0 %
Number of Iterations: 3 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 1 [2028 DES PM Stop 3-way Stage 1 (Minor Road) NSW]

Network: N101 [2028 PM]

Silverdale Road / Central Access Priority Controlled Intersection

Staged crossing Stage 1 (Minor Road) at three-way intersection with 5-lane major road. Major road turn lane is treated as a full-length lane.
Stop (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Arrival Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Central Access Road (East)													
1	L2	187	0.0	187	0.0	0.101	5.6	LOS A	0.0	0.0	0.00	0.53	54.9
2	T1	187	0.0	187	0.0	0.524	19.1	LOS B	2.6	18.3	0.84	1.05	37.1
Approach		375	0.0	375	0.0	0.524	12.3	LOS A	2.6	18.3	0.42	0.79	47.3
East: Silverdale Road (North)													
4	L2	134	0.0	134	0.0	0.072	5.5	LOS A	0.0	0.0	0.00	0.58	53.6
5	T1	749	0.0	749	0.0	0.384	0.1	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		883	0.0	883	0.0	0.384	0.9	NA	0.0	0.0	0.00	0.09	58.9
West: Silverdale Road (South)													
12	R2	127	5.0	127	5.0	0.282	13.9	LOS A	1.1	8.3	0.75	0.93	47.6
Approach		127	5.0	127	5.0	0.282	13.9	NA	1.1	8.3	0.75	0.93	47.6
All Vehicles		1385	0.5	1385	0.5	0.524	5.2	NA	2.6	18.3	0.18	0.35	54.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 0.0 %
Number of Iterations: 3 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 2 [2028 DES PM Stop 3-way Stage 2 (Median) NSW]

Network: N101 [2028 PM]

Silverdale Road / Central Access Priority Controlled Intersection

Staged crossing Stage 2 (Median) at three-way intersection with 5-lane major road.
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

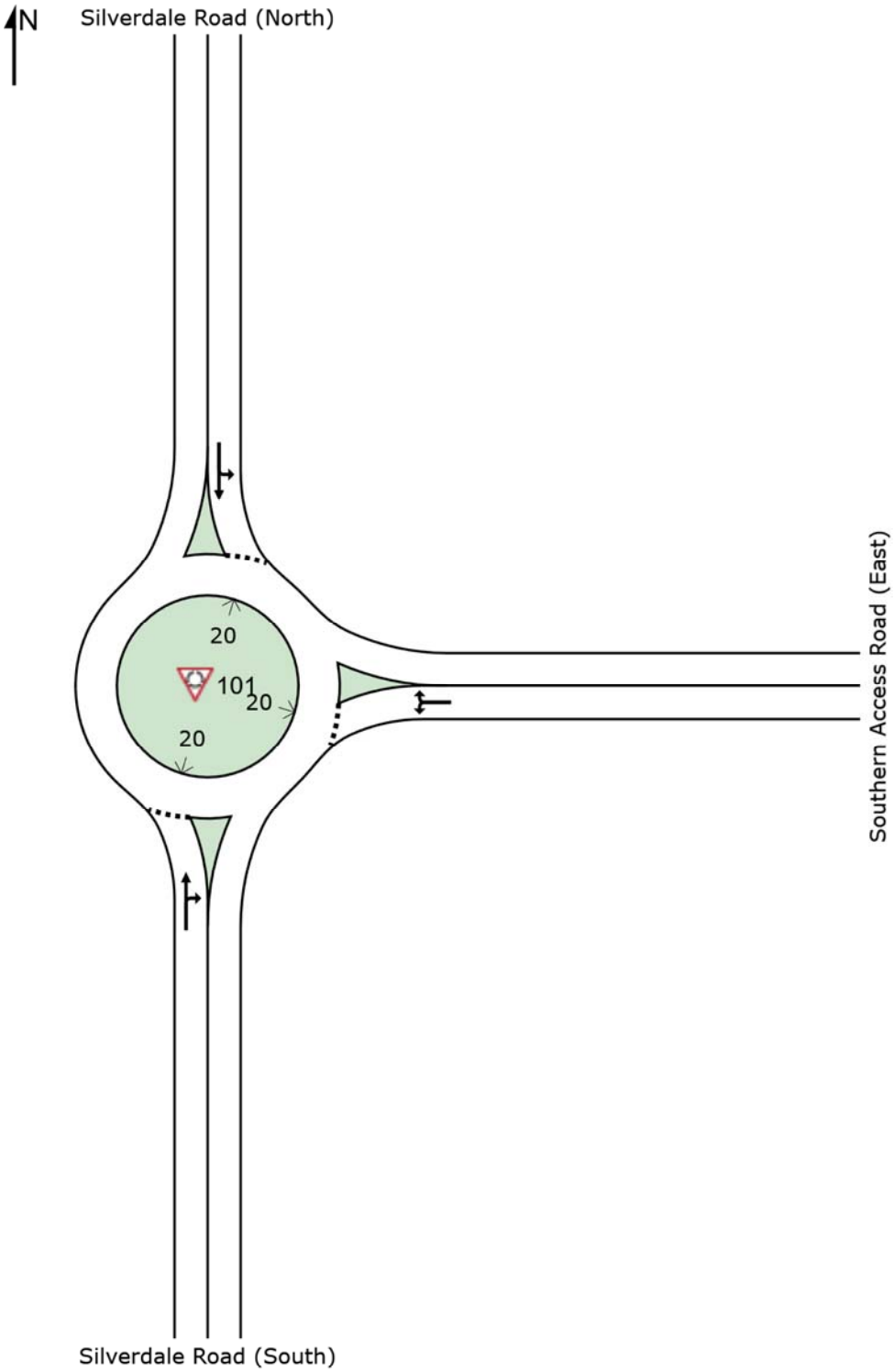
Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Median Storage Area													
3	R2	187	0.0	187	0.0	0.019	0.0	LOS A	0.0	0.0	0.00	0.00	20.0
Approach		187	0.0	187	0.0	0.019	0.0	NA	0.0	0.0	0.00	0.00	20.0
West: Silverdale Road (South)													
11	T1	466	0.0	466	0.0	0.239	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		466	0.0	466	0.0	0.239	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		654	0.0	654	0.0	0.239	0.0	NA	0.0	0.0	0.00	0.00	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.
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.
Network Model Accuracy Level (largest change in degree of saturation for any lane): 0.0 %
Number of Iterations: 3 (maximum specified: 10)

SITE LAYOUT

Site: 101 [2028 DES AM]

Silverdale Road / Southern Access Roundabout
Roundabout



MOVEMENT SUMMARY

Site: 101 [2028 DES AM]

Silverdale Road / Southern Access Roundabout
Roundabout

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Silverdale Road (South)											
2	T1	780	5.0	0.612	5.2	LOS A	6.3	46.3	0.54	0.50	54.1
3	R2	27	5.0	0.612	9.8	LOS A	6.3	46.3	0.54	0.50	53.9
Approach		807	5.0	0.612	5.3	LOS A	6.3	46.3	0.54	0.50	54.1
East: Southern Access Road (East)											
4	L2	38	0.0	0.193	7.9	LOS A	1.1	8.0	0.69	0.78	50.1
6	R2	122	0.0	0.193	12.7	LOS A	1.1	8.0	0.69	0.78	51.1
Approach		160	0.0	0.193	11.6	LOS A	1.1	8.0	0.69	0.78	50.9
North: Silverdale Road (North)											
7	L2	124	5.0	0.494	4.1	LOS A	4.6	33.4	0.20	0.40	54.5
8	T1	648	5.0	0.494	4.3	LOS A	4.6	33.4	0.20	0.40	55.8
Approach		773	5.0	0.494	4.3	LOS A	4.6	33.4	0.20	0.40	55.6
All Vehicles		1740	4.5	0.612	5.4	LOS A	6.3	46.3	0.41	0.48	54.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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 [2028 DES PM]

Silverdale Road / Southern Access Roundabout
Roundabout

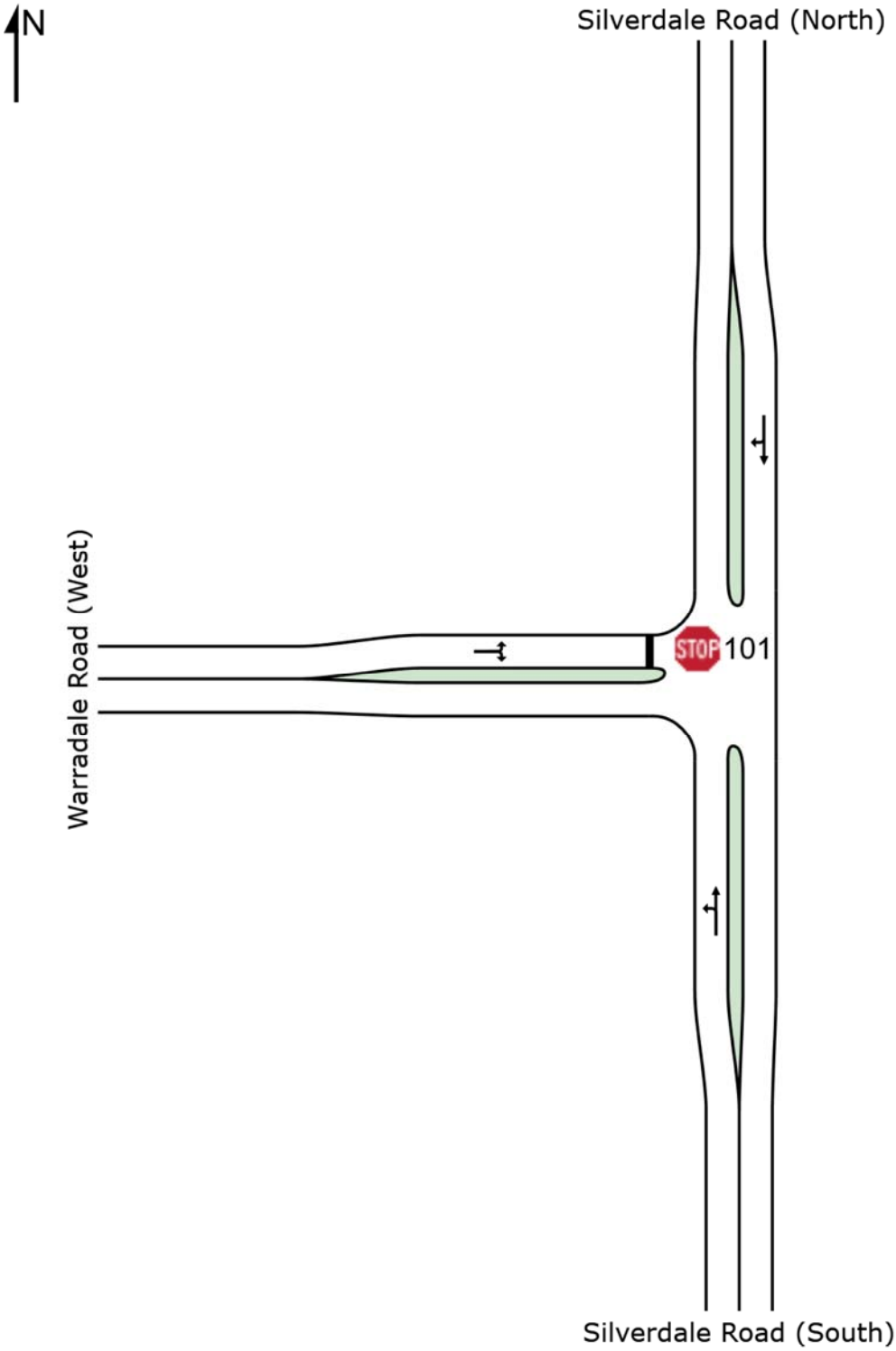
Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Silverdale Road (South)											
2	T1	468	5.0	0.334	4.3	LOS A	2.7	19.6	0.19	0.41	55.6
3	R2	38	5.0	0.334	8.9	LOS A	2.7	19.6	0.19	0.41	55.5
Approach		506	5.0	0.334	4.6	LOS A	2.7	19.6	0.19	0.41	55.6
East: Southern Access Road (East)											
4	L2	27	0.0	0.100	11.5	LOS A	0.6	4.5	0.83	0.81	48.4
6	R2	31	0.0	0.100	16.3	LOS B	0.6	4.5	0.83	0.81	49.4
Approach		58	0.0	0.100	14.0	LOS A	0.6	4.5	0.83	0.81	48.9
North: Silverdale Road (North)											
7	L2	40	5.0	0.658	4.3	LOS A	7.3	53.1	0.29	0.40	54.0
8	T1	980	5.0	0.658	4.5	LOS A	7.3	53.1	0.29	0.40	55.4
Approach		1020	5.0	0.658	4.5	LOS A	7.3	53.1	0.29	0.40	55.3
All Vehicles		1584	4.8	0.658	4.9	LOS A	7.3	53.1	0.28	0.42	55.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
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.

SITE LAYOUT

Site: 101 [2028 DES AM]

Silverdale Road / Warradale Road Priority Controlled Intersection
Stop (Two-Way)



MOVEMENT SUMMARY

Site: 101 [2028 DES AM]

Silverdale Road / Warradale Road Priority Controlled Intersection
Stop (Two-Way)

Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Silverdale Road (South)											
1	L2	20	5.0	0.442	5.7	LOS A	0.0	0.0	0.00	0.01	57.9
2	T1	814	5.0	0.442	0.1	LOS A	0.0	0.0	0.00	0.01	59.7
Approach		834	5.0	0.442	0.2	NA	0.0	0.0	0.00	0.01	59.7
North: Silverdale Road (North)											
8	T1	369	5.0	0.428	5.2	LOS A	3.6	25.9	0.64	0.26	53.3
9	R2	138	5.0	0.428	13.9	LOS A	3.6	25.9	0.64	0.26	51.3
Approach		507	5.0	0.428	7.6	NA	3.6	25.9	0.64	0.26	52.8
West: Warradale Road (West)											
10	L2	144	5.0	0.473	19.2	LOS B	2.1	15.1	0.83	1.10	44.3
12	R2	22	5.0	0.473	36.8	LOS C	2.1	15.1	0.83	1.10	43.9
Approach		166	5.0	0.473	21.5	LOS B	2.1	15.1	0.83	1.10	44.2
All Vehicles		1507	5.0	0.473	5.0	NA	3.6	25.9	0.31	0.22	55.1

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

MOVEMENT SUMMARY

Site: 101 [2028 DES PM]

Silverdale Road / Warradale Road Priority Controlled Intersection
Stop (Two-Way)

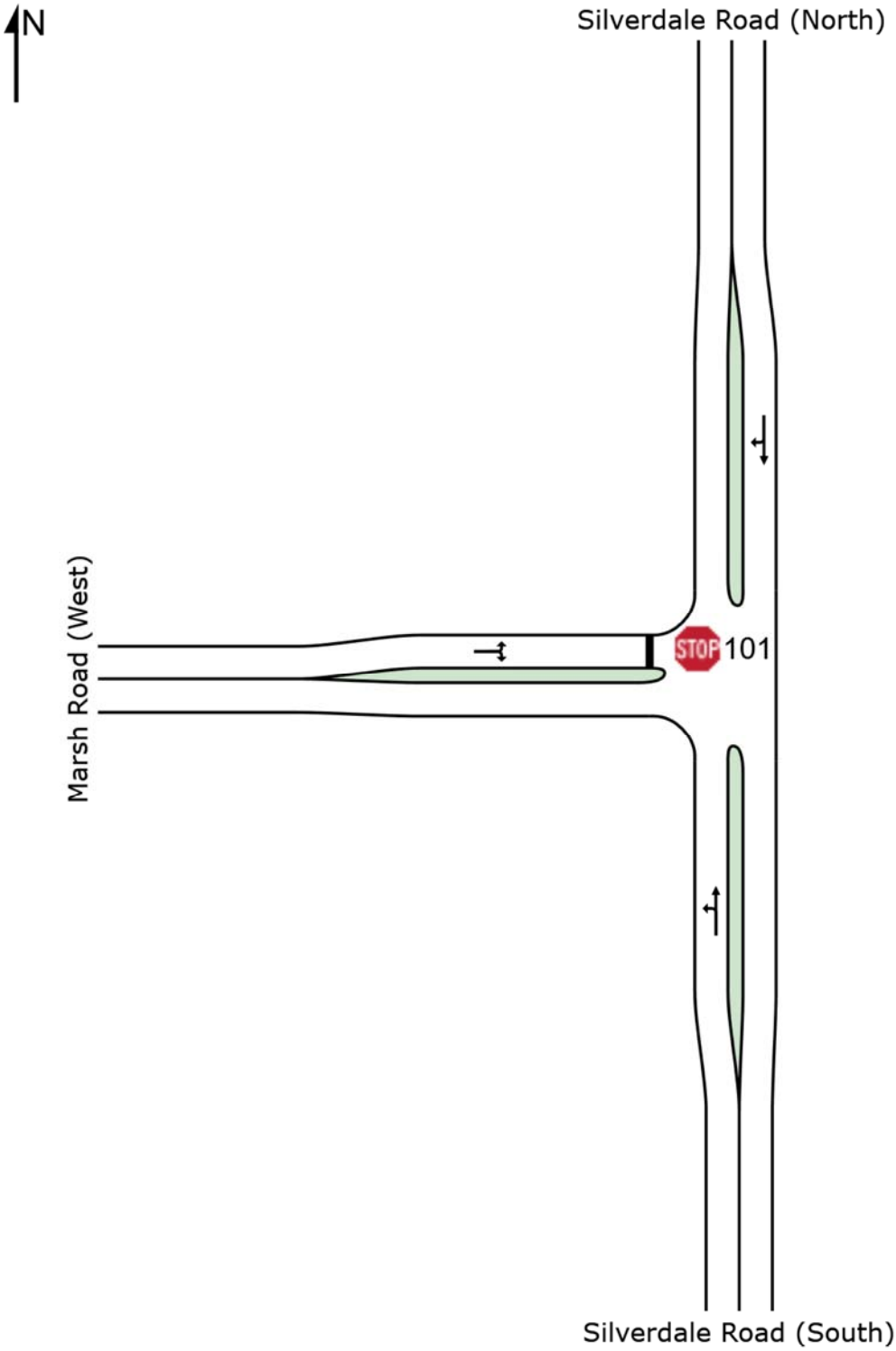
Movement Performance - Vehicles											
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Silverdale Road (South)											
1	L2	31	5.0	0.236	5.6	LOS A	0.0	0.0	0.00	0.04	57.7
2	T1	413	5.0	0.236	0.0	LOS A	0.0	0.0	0.00	0.04	59.6
Approach		443	5.0	0.236	0.4	NA	0.0	0.0	0.00	0.04	59.4
North: Silverdale Road (North)											
8	T1	636	5.0	0.456	1.2	LOS A	2.4	17.2	0.29	0.12	57.6
9	R2	128	5.0	0.456	9.0	LOS A	2.4	17.2	0.29	0.12	55.3
Approach		764	5.0	0.456	2.5	NA	2.4	17.2	0.29	0.12	57.2
West: Warradale Road (West)											
10	L2	91	5.0	0.198	10.5	LOS A	0.7	5.1	0.56	0.95	49.0
12	R2	19	5.0	0.198	25.6	LOS B	0.7	5.1	0.56	0.95	48.5
Approach		109	5.0	0.198	13.1	LOS A	0.7	5.1	0.56	0.95	48.9
All Vehicles		1317	5.0	0.456	2.7	NA	2.4	17.2	0.22	0.16	57.1

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

SITE LAYOUT

Site: 101 [2028 DES AM]

Silverdale Road / Marsh Road Priority Controlled Intersection
Stop (Two-Way)



MOVEMENT SUMMARY

Site: 101 [2028 DES AM]

Silverdale Road / Marsh Road Priority Controlled Intersection
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Silverdale Road (South)											
1	L2	34	5.0	0.286	5.6	LOS A	0.0	0.0	0.00	0.04	57.7
2	T1	505	5.0	0.286	0.0	LOS A	0.0	0.0	0.00	0.04	59.6
Approach		539	5.0	0.286	0.4	NA	0.0	0.0	0.00	0.04	59.5
North: Silverdale Road (North)											
8	T1	387	5.0	0.228	0.3	LOS A	0.3	2.2	0.09	0.03	59.3
9	R2	22	5.0	0.228	8.6	LOS A	0.3	2.2	0.09	0.03	56.8
Approach		409	5.0	0.228	0.8	NA	0.3	2.2	0.09	0.03	59.1
West: Marsh Road (West)											
10	L2	49	0.0	0.331	12.0	LOS A	1.3	9.2	0.70	1.05	47.4
12	R2	98	0.0	0.331	17.6	LOS B	1.3	9.2	0.70	1.05	47.0
Approach		147	0.0	0.331	15.7	LOS B	1.3	9.2	0.70	1.05	47.1
All Vehicles		1096	4.3	0.331	2.6	NA	1.3	9.2	0.13	0.17	57.3

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

MOVEMENT SUMMARY

Site: 101 [2028 DES PM]

Silverdale Road / Marsh Road Priority Controlled Intersection
Stop (Two-Way)

Movement Performance - Vehicles												
Mov ID	OD Mov	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Silverdale Road (South)											
1	L2	40	5.0	0.213	5.6	LOS A	0.0	0.0	0.00	0.06	57.6
2	T1	361	5.0	0.213	0.0	LOS A	0.0	0.0	0.00	0.06	59.4
Approach		401	5.0	0.213	0.6	NA	0.0	0.0	0.00	0.06	59.2
North: Silverdale Road (North)											
8	T1	182	5.0	0.116	0.3	LOS A	0.2	1.6	0.13	0.07	58.9
9	R2	22	5.0	0.116	7.3	LOS A	0.2	1.6	0.13	0.07	56.4
Approach		204	5.0	0.116	1.1	NA	0.2	1.6	0.13	0.07	58.6
West: Marsh Road (West)											
10	L2	57	0.0	0.293	10.3	LOS A	1.2	8.5	0.54	1.00	49.9
12	R2	141	0.0	0.293	12.1	LOS A	1.2	8.5	0.54	1.00	49.5
Approach		198	0.0	0.293	11.6	LOS A	1.2	8.5	0.54	1.00	49.6
All Vehicles		803	3.8	0.293	3.4	NA	1.2	8.5	0.17	0.29	56.4

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