

Proposed Rezoning Proposal for Residential Subdivision 44 Middle Arm Road, Goulburn

Traffic and Parking Assessment Report

Prepared for: Ironstone Property Pty Ltd

May 2023

Report No: PT22061r01_Final_V3

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1. Introduction

This report has been prepared on behalf of Ironstone Property Pty Ltd to present findings of a traffic and parking assessment of the proposed rezoning of the site known as No.44 Middle Arm Road, Goulburn to provide a potential 93 residential housing lots.

The study has assessed existing traffic conditions, access arrangements, future traffic conditions and design compliance with applicable standards and policies.

The remainder of the report is set out as follows:

- Section 2 describes the existing traffic and parking conditions;
- Section 3 summarises the proposed development;
- Section 4 reviews the potential traffic impacts of the proposal;
- Section 5 reviews the design for compliance with relevant standards; and
- Section 6 presents the conclusions

2. Existing Development / Conditions

The following presents a summary of existing site and traffic conditions.

2.1 Site Location

The development site includes a single dwelling large rural residential property with a direct frontage to Middle Arm Road. The location of the site is shown in **Figure 1**.

Figure 1 - Site Location



Source: Nearmap

2.2 Existing Site Traffic Generation

The site includes a single residential dwelling and as such is expected to generate one (1) peak hour trip in the AM and PM peak periods.

2.3 Goulburn Mulwaree Council Urban Fringe Strategy

It is noted that the subject site is located within the Middle Arm East designated area and in close proximity to further residential release areas as identified in the Goulburn Mulwaree Council Urban Fringe Strategy which is described below:

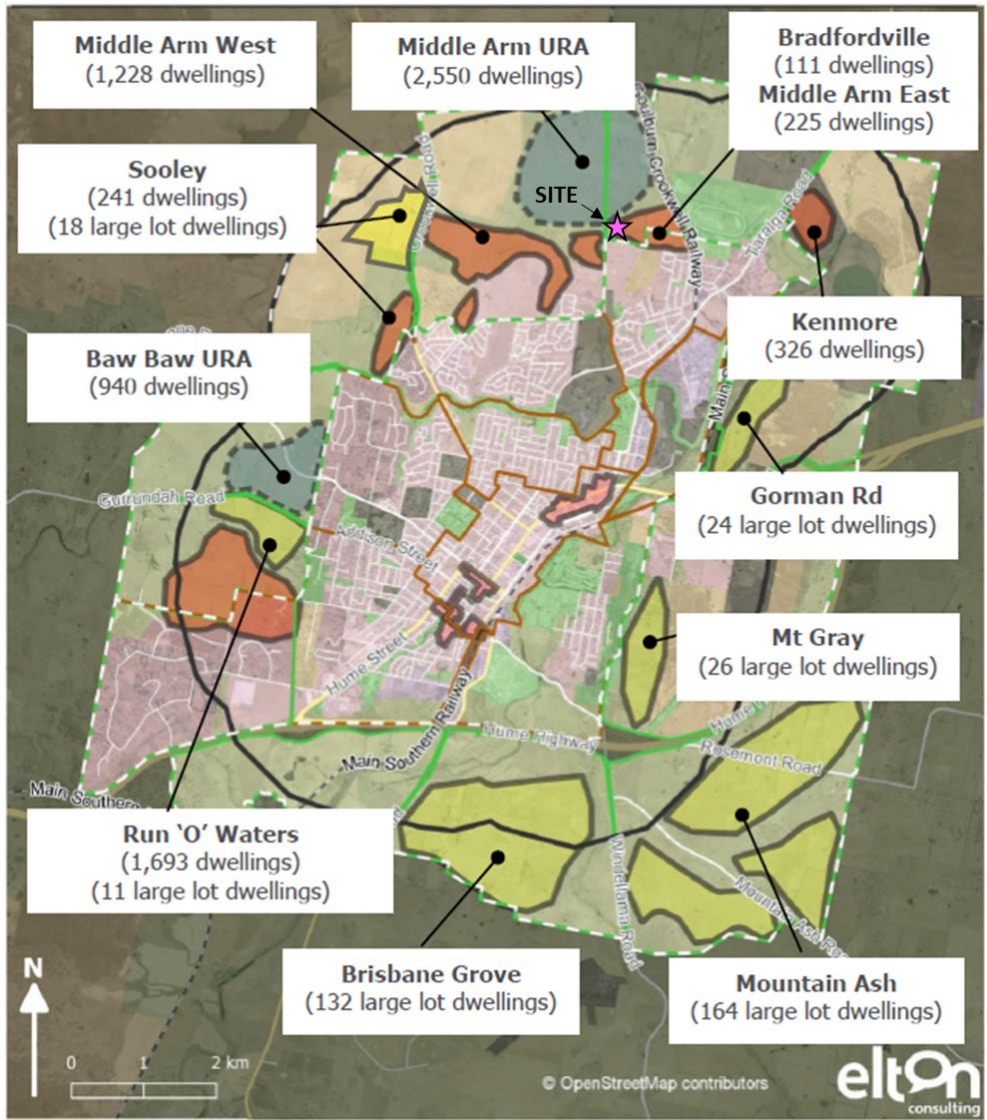
This Urban and Fringe Housing Strategy (Strategy) investigates and identifies areas suitable for the provision of additional housing to assist Goulburn Mulwaree Council (Council) meet the housing demands generated by expected continued population growth. The Strategy has been prepared in response to both the limited supply of residential land available to meet the short and medium term needs of the community and the directions of the South East and Tablelands Regional Plan 2036.

The scope of the Strategy includes looking at the urban areas of Goulburn and Marulan and identifying opportunities for an additional recommended 3,500 dwellings over the next 18 years to 2036.

The Strategy also considers land for large lot residential development (typically greater than 2ha and often referred to as rural residential development) particularly on the urban fringe of Goulburn.¹

The location of the development site in the context of the overall areas identified for increased housing is shown below in **Figure 2**.

Figure 2 – Site Location Adjacent to Goulburn Mulwaree Council Urban Fringe Strategy Precincts



The Goulburn Mulwaree Council Urban Fringe Strategy – Elton Consulting 2020 indicates a total expected yield of 225 Dwellings within the Middle Arm East precinct.

¹ Goulburn Mulwaree Council Urban Fringe Strategy – Elton Consulting 2020

2.4 Classification Criteria

It is usual to classify roads according to a road hierarchy in order to determine their functional role within the road network. Changes to traffic flows on the roads can then be assessed within the context of the road hierarchy. Roads are classified according to the role they fulfil and the volume of traffic they should appropriately carry. The RTA has set down the following guidelines for the functional classification of roads.

- Arterial Road – typically a main road carrying over 15,000 vehicles per day and fulfilling a role as a major inter-regional link (over 1,500 vehicles per hour)
- Sub-arterial Road – defined as secondary inter-regional links, typically carrying volumes between 5,000 and 20,000 vehicles per day (500 to 2,000 vehicles per hour)
- Collector Road – provides a link between local roads and regional roads, typically carrying between 2,000 and 10,000 vehicles per day (250 to 1,000 vehicles per hour). At volumes greater than 5,000 vehicles per day, residential amenity begins to decline noticeably.
- Local Road – provides access to individual allotments, carrying low volumes, typically less than 2,000 vehicles per day (250 vehicles per hour).

2.5 Existing Road Network

Middle Arm Road – is a local Collector Road with a single travel lane in each direction and unformed shoulders across the frontage of the site. Across the frontage of the site the road includes a speed limit of 100km/hr in both directions. Approximately 700m south of the site, the speed limit reduces to 60km/hr for southbound traffic. The intersection of Middle Arm Road / Marys Mount Road includes a priority-controlled intersection. Middle Arm Road includes a recently constructed shared pedestrian / cycleway along its western side from Marys Mount Road to McDermott Drive in the south.

Marys Mount Road – is a local road linking key roads of Crookwell Road in the south west with Middle Arm Road in the east. This road provides a key access to recently constructed residential subdivisions. The majority of intersections are either controlled by roundabouts or priority-controlled intersections. Mary Mount Road includes a carriageway width of approximately 10.0m and a post speed limit of 50km/hr. The road also includes a shared pedestrian / cycleway along the northern edge of the road extending from Middle Arm Road to No.113 Marys Mount Road for a distance of approximately 640m.

2.6 Existing Traffic Flows

To gauge existing traffic flows on the surrounding road network, an intersection count of Middle Arm Road / Marys Mount Road was undertaken during the morning and afternoon peak periods on a weekday. The location of the count is shown below:

Figure 3 – Weekday Peak Hour Intersection Count Locations



Copies of all counts count can be found in [Appendix A](#) of this report. The peak flows by direction in each street at the intersection (recorded from the intersection count) are summarised below.

Table 1 – Existing Weekday Peak Period Volumes in vicinity of site (veh/hr)

Road	Location	Weekday AM		Weekday PM	
		NB/EB	SB/WB	NB/EB	SB/WB
Middle Arm Rd	North of Marys Mount Rd	19	56	99	27
	South of Marys Mount Rd	131	216	202	113
Marys Mount Rd	West of Middle Arm Rd	175	127	99	162

From [Table 1](#) it can be seen that existing flows on surrounding roads are in generally in line with their classification.

2.7 Existing Intersection Operating Conditions

All intersections surveyed have been analysed using the Sidra Intersection analysis program. Sidra Intersection determines the average delay that vehicles encounter, the degree of saturation of the intersection, and the level of service. The degree of saturation is the ratio of the arrival rate of vehicles to the capacity of the approach. Sidra Intersection provides analysis of the operating conditions which can be compared to the performance criteria set out in [Table 2](#).

Table 2 – Level of Service Criteria

Level of Service	Average Delay per Vehicle (secs/veh)	Signals & Roundabouts	Give Way & Stop Signs
A	less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & Spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode
F	> 70	Extra capacity required	Extreme delay, traffic signals or other major treatment required

Adapted from RTA Guide to Traffic Generating Developments, 2002.

For roundabouts and priority intersections, the reported average delay is for the individual movement with the highest average delay per vehicle. At signalised intersections, the reported average delay is over all movements. The two intersections surveyed have been modelled as a network given their close proximity to each other. The existing weekday and weekend day intersection operating conditions are presented in [Table 3](#). Average delay is expressed in seconds per vehicle. It should be noted that given their close proximity the intersections have been modelled as a network within SIDRA.

Table 3 – Existing Weekday AM / PM Peak Intersection Operating Conditions

Intersection	Control	Weekday AM Peak		Weekday PM Peak	
		Av Delay	LOS	Av Delay	LOS
Middle Arm Rd / Marys Mount Rd	Priority	6.1	A	6.1	A

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From [Table 3](#) it is noted that all intersections surveyed adjacent to the development site currently operate at a satisfactory level of service with spare capacity.

2.8 Mid-Block Capacity Assessment

On the matter of mid-block capacity of roads surveyed versus demands, the following mid-block capacities are typical by road type.

Table 4 – Austroads 2020 Lane Mid-Block Capacities

Type of lane	One-way mid-block capacity (pc/h)
Median or inner lane	
Divided road	1000
Undivided road	900
Middle lane (of a 3 lane carriageway)	
Divided road	900
Undivided road	1000
Kerb lane	
Adjacent to parking lane	900
Occasional parked vehicles	600
Clearway conditions	900

Source: Austroads (2020)

Therefore, the existing volume capacity ratios of each road surveyed around the development site is shown below in **Table 5**.

Table 5 – Volume / Capacity Analysis of Roads Surrounding Development Site

Road	Two Way Mid-Block Capacity	AM Peak Hour Two Way Flow	AM Peak V/C	PM Peak Hour Two Way Flow	PM Peak V/C
Middle Arm Rd – North of Marys Mount Rd	1,800	75	0.042	80	0.044
Middle Arm Rd - South of Marys Mount Rd	1,800	347	0.193	315	0.175
Marys Mount Rd – West of Middle Arm Rd	1,200	302	0.252	261	0.218

From **Table 5** it is evident that roads immediately in the vicinity of the development site have significant spare mid-block capacity.

2.9 Public Transport - Buses

At the time of preparing this report no formal route bus services operates past the development site in Middle Arm Road. The closest route service includes the PBC Goulburn Bus Route 821A / 821B operating along Marys Mount Road. This loop service provides direct access to the Goulburn CBD. The location of the site relative to the above service routes is shown below.

Figure 4 – Existing Bus Stops Near Site



3. The Proposed Development

The key components of the proposed development are summarised below:

- Rezoning proposal to allow for an approximate **93** residential lots within the boundary of No.44 Middle Arm Road, Goulburn.
- Internal road network serving the lots with a single direct intersection connection with Middle Arm Road in the form of a BAR / BAL intersection arrangement.
- Internal road network to service adjacent residential lots.

Plans of the potential development arrangement of the site including the internal road network are provided in **Appendix B** of this report.

4. Potential Traffic Impacts

4.1 Introduction

The following presents an assessment of the potential traffic impacts of the proposal using the Roads and Traffic Authority Guide to Traffic Generating Developments standard approach.

4.2 Development Traffic Generation

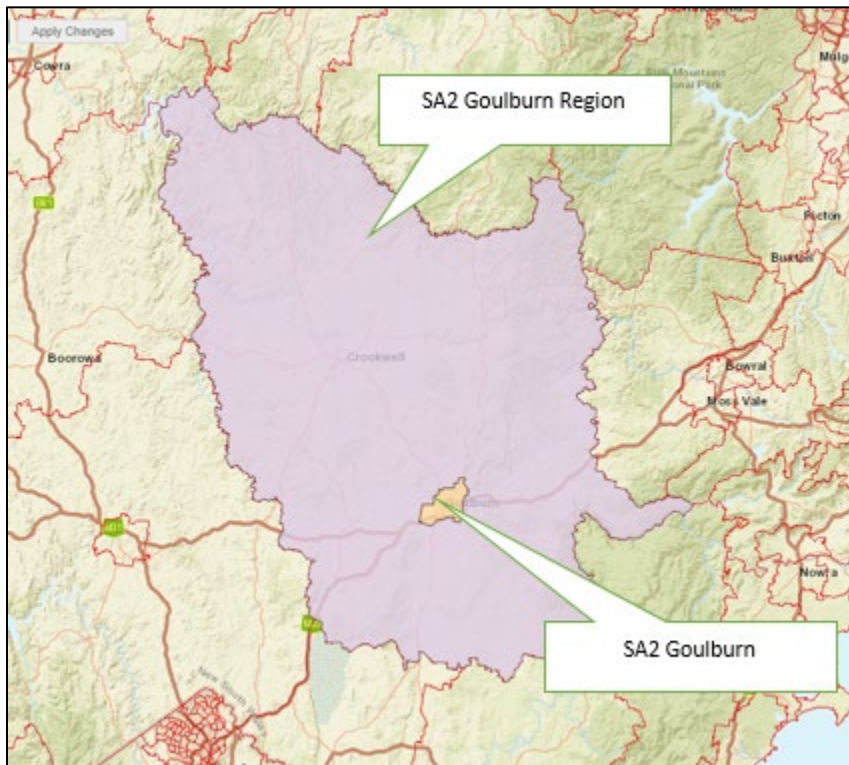
On the basis that the full estimated 93 lots are achieved, applying the Transport for NSW Technical Direction TDT2013/04a rate to the proposed development for a regional setting would equate to **92 AM Peak** trips two way and **84 PM Peak** trips two way. The expected trip distribution as per the recommendations of the RTA Guide to Traffic Generating Developments would be 80% outbound in the AM peak and 20% inbound. The reverse would occur during the PM peak hour.

4.3 Journey to Work Census Assessment

The following presents an assessment of the existing travel to work characteristics of the Goulburn area including the subject site. This provides an indication of the potential travel patterns of the residents of the proposed subdivision.

The 2016 Census of Population and Housing collected information about how people travelled to work on Census day. In combination with information about where the person worked, it is possible to use the census data to provide an indication of how people travelled to work and where they travelled to. The statistical hierarchy level in and around the site (SA2) is shown in [Figure 5](#).

Figure 5 – Statistical area level 2 (SA2) around Goulburn



This indicates that the main urban centre of Goulburn is contained within SA2 Goulburn, and this in turn is surrounded by SA2 Goulburn Region. The number and type of dwellings in these two SA2s are summarised in [Table 6](#).

Table 6 – Dwelling types, SA2-Goulburn and SA2-Goulburn Region, 2016 Census

Dwelling type	SA2 - Goulburn		SA2 - Goulburn Region	
	No.	%	No.	%
Occupied private dwellings	9,059	89%	5,036	74%
Unoccupied private dwellings	1,036	10%	1,777	26%
Non-private dwellings	71	1%	17	0%
Migratory	0	0%	0	0%
Off-shore	0	0%	0	0%
Shipping	0	0%	0	0%
Total	10,166	100%	6,830	100%

Source: ABS TableBuilder Pro

This summary indicates that almost all dwellings in each SA2 are private dwellings, with SA2 – Goulburn having a lower proportion (10% versus 26%) of unoccupied private dwellings than SA2 – Goulburn Region. This is likely due to a smaller proportion of holiday homes in Goulburn than in Goulburn Region. Also, it should be noted that despite SA2 - Goulburn being much smaller in area than SA2 - Goulburn Region, it has substantially more dwellings.

The distribution of dwelling structures in these two SA2s is shown in [Table 7](#).

Table 7 – Distribution of dwelling structures, SA2-Goulburn and SA2-Goulburn Region, 2016 Census

Dwelling structure	SA2 - Goulburn		SA2 - Goulburn Region	
	No.	%	No.	%
Separate house	8,335	82%	6,419	94%
Semi-detached, row or terrace house, townhouse etc. 1 storey	912	9%	72	1%
Semi-detached, row or terrace house, townhouse etc. 2+ storeys	153	2%	9	0%
House or flat attached to a shop, office, etc.	48	0%	27	0%
Flat or apartment attached to a house	5	0%	0	0%
Flat or apartment in a one or two storey block	407	4%	8	0%
Flat or apartment in a three storey block	92	1%	0	0%
Flat or apartment in a four or more storey block	0	0%	0	0%
Caravan	39	0%	63	1%
Cabin, houseboat	31	0%	87	1%
Improvised home, tent, sleepers out	11	0%	79	1%
Not applicable	71	1%	17	0%
Not stated	65	1%	50	1%
Total	10,169	100%	6,831	100%

Source: ABS TableBuilder Pro

This analysis indicates that in the more urban SA2-Goulburn, separate dwelling structures are still dominate, although there are appreciably more town houses and apartments than in SA2-Goulburn Region. The mode shares for the journey to work for these two SA2s are summarised in [Table 8](#).

Table 8 – Mode share for JTW from SA2-Goulburn and SA2-Goulburn Region, 2016 Census

Mode	SA2-Goulburn		SA2-Goulburn Region	
	No.	% of those who commuted	No.	% of those who commuted
Train	25	0.3%	24	0.6%
Bus	80	0.9%	23	0.6%
Ferry	0	0.0%	4	0.1%
Tram	0	0.0%	0	0.0%
Car Dr	7,116	82.2%	3,442	82.4%
Car px	704	8.1%	228	5.5%
Motorbike/scooter	44	0.5%	43	1.0%
Bicycle	25	0.3%	5	0.1%
Walked	422	4.9%	197	4.7%
Other	241	2.8%	213	5.1%
DNGTW	978		595	
Worked at home	256		746	
NS	112		86	
Total	10,003	100.0%	5,606	100.0%
<i>Travelled</i>	<i>8,657</i>		<i>4,179</i>	

DNGTW – did not go to work; NS – not stated

Source: ABS TableBuilder Pro

The above mode shares indicate that car as driver is the most common JTW mode, in combination with car passenger, it accounted for some 90% of commuter trips. The distribution of JTW trips was examined using SA2 to local government area (LGA) geography. We have coded LGAs in Greater Sydney to an area termed Gt Sydney to make the analysis more useful and easier to follow.

Table 9 – Commuter travel patterns from usual residence at SA2 to place of work LGA, car driver and car passenger, 2016 Census

Place of work LGA	From SA2 Goulburn		From SA2 Goulburn Region	
	No.	%	No.	%
Goulburn Mulwaree (A)	6,200	82%	1,748	48%
ACT	504	7%	283	8%
No Fixed Address (NSW)	309	4%	265	7%
Wingecarribee (A)	135	2%	205	6%
Gt Sydney	121	2%	150	4%
Queanbeyan-Palerang Regional (A)	118	2%	57	2%
Upper Lachlan Shire (A)	109	1%	900	25%
Yass Valley (A)	26	0%	20	1%
Wollongong (C)	11	0%	17	0%
Griffith (C)	7	0%	0	0%
Shellharbour (C)	5	0%	5	0%
Bathurst Regional (A)	5	0%	0	0%
Cabonne (A)	5	0%	0	0%
Hilltops (A)	4	0%	12	0%
Shoalhaven (C)	4	0%	10	0%
Albury (C)	3	0%	0	0%
Wagga Wagga (C)	3	0%	0	0%
Total	7,569	100%	3,672	100%

Note: 'No fixed address' includes contractors using home as their work base, including transport workers, trades, sales reps

Source: ABS TableBuilder Pro

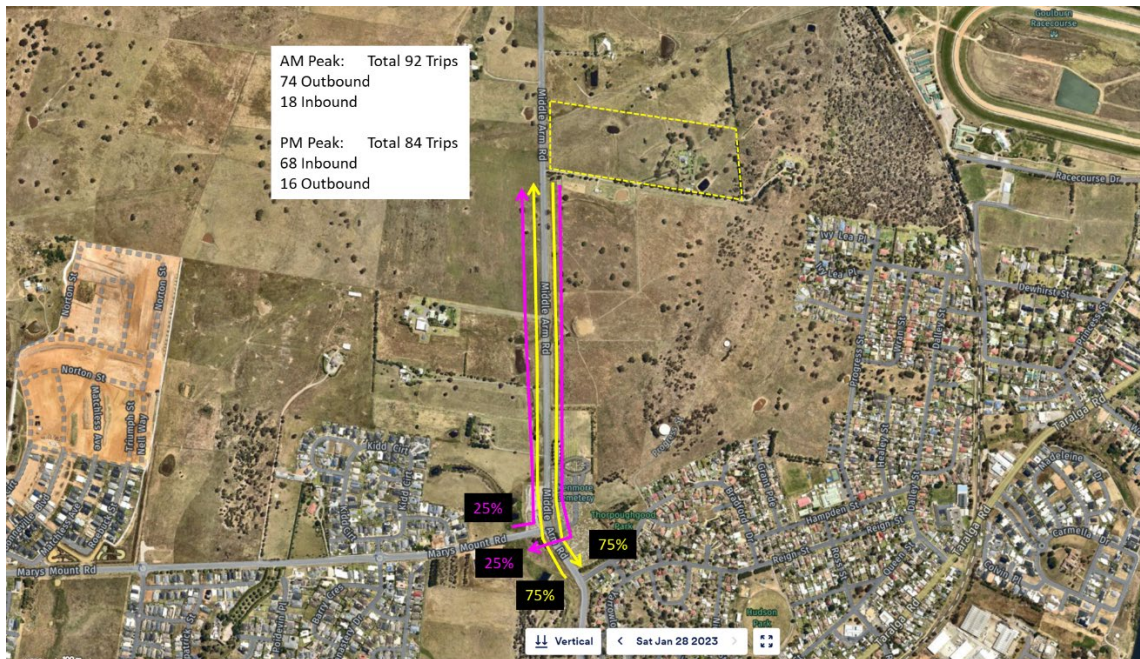
As mentioned previously the site is situated in SA2 Goulburn Region. The travel characteristics by occupants of the proposed housing at the site are more likely to mirror the existing residents of SA2 Goulburn as opposed to existing residents of SA2 Goulburn Region.

The above analysis indicates that a very large proportion of commute trips by car from SA2 Goulburn are to LGA of Goulburn at **82%**, which is not surprising given that, in approximate terms, the urban centre of Goulburn is relatively isolated from surrounding employment concentrations, being some 80 to 90km from the ACT and a similar distance from the Southern Highlands (which is a small employment centre). The ACT is the second highest destination at 7%, 'no fixed address' for place of work is the third highest at 4%, with Wingecarribee and Gt Sydney accounting for a combined 4%.

4.4 Trip Distribution

Having regards to the above journey to work assessment of the census data for the Goulburn region, it has been assumed that *all* generated traffic would travel to / from the south via Middle Arm Road. Further, 25% of all generated traffic would travel to the west via Marys Mount Road. The resulting traffic generation and distribution of trips is shown below in **Figure 6**

Figure 6 – Assumed Route of Travel of Generated Trips



4.5 Future Intersection Operating Conditions

The additional traffic generated by the proposal has been added to the surrounding road network in accordance with the adopted distribution of trips presented above. The resulting future intersection operating conditions is presented below in **Table 10**.

Table 10 – Existing Weekday AM / PM Peak Intersection Operating Conditions

Intersection	Control	Weekday AM Peak		Weekday PM Peak	
		Av Delay	LOS	Av Delay	LOS
Middle Arm Rd / Marys Mount Rd	Priority	6.5	A	6.4	A

Avg Delay (sec/veh) is over all movements at signals, and for worst movement at priority and roundabouts

From **Table 10** it is noted that all intersections surveyed in the vicinity of the proposed development would all continue to operate at a satisfactory level of service in the future upon *full* development of the subject site. Further, there would be no requirement for upgrades at the intersection to accommodate the traffic demands of the proposal on the existing road network.

SIDRA outputs of all models are provided in **Appendix C** of this report.

4.6 Mid-Block Capacity Assessment

The future volume versus capacity ratios of roads surveyed surrounding the development site are shown below in **Table 11**.

Table 11 – Future Volume / Capacity Analysis of Roads Surrounding Development Site

Road	Two Way Mid-Block Capacity	AM Peak Hour Two Way Flow	AM Peak V/C	PM Peak Hour Two Way Flow	PM Peak V/C
Middle Arm Rd – North of Marys Mount Rd	1,800	167	0.093	164	0.091
Middle Arm Rd - South of Marys Mount Rd	1,800	416	0.231	378	0.210
Marys Mount Rd – West of Middle Arm Rd	1,200	325	0.271	282	0.235

From **Table 11** it is evident that following full occupation of the development, the volume versus capacity ratios of roads immediately in the vicinity of the development site would remain within acceptable limits.

Overall, the traffic impacts of the proposal are considered acceptable.

Given that the proposal would extend the expanding residential areas of the surrounding area it is also recommended that the existing 60km/hr speed limit is extended to the northern boundary of the subject site in place of the existing 100km/hr speed zone environment to more reflect the new residential nature of the area in the vicinity of the development site.

5. Road Network Compliance Review

5.1 Goulburn Council Engineering Standard Requirements

The proposal includes the following road corridor widths by location:

- Road 1 – 20m road reservation
- Road 2 – 15m road reservation
- Road 3 – 20m road reservation
- Road 4 - 20m road reservation
- Road 5 - 20m road reservation
- Road 6 - 20m road reservation
- Road 7 - 20m road reservation

Thus, all road reservations within the proposed staged subdivision comply with the minimum requirements of Goulburn Council and thus would be considered satisfactory.

6. Conclusions

This report has reviewed the potential traffic impacts of the proposed rezoning proposal to allow the potential for 93 residential lots at the site known as No.44 Middle Arm Road, Goulburn. The findings of this assessment are presented below:

1. The potential traffic generation of the development would not impact on the surrounding road network to a point of detriment.
2. Intersections in the immediate vicinity of the development would operate at a satisfactory level of service in the future at full development without any need for capacity improvements.
3. All proposed internal roads comply with the minimum requirements of Goulburn Council Engineering Standards.
4. Consideration should be given to extending the existing 60km/hr speed zone in Middle Arm Road near Marys Mount Road to the northern boundary of the site to better reflect the residential environment of Middle Arm Road in the future.

Overall, the traffic impacts of the proposal are considered acceptable.



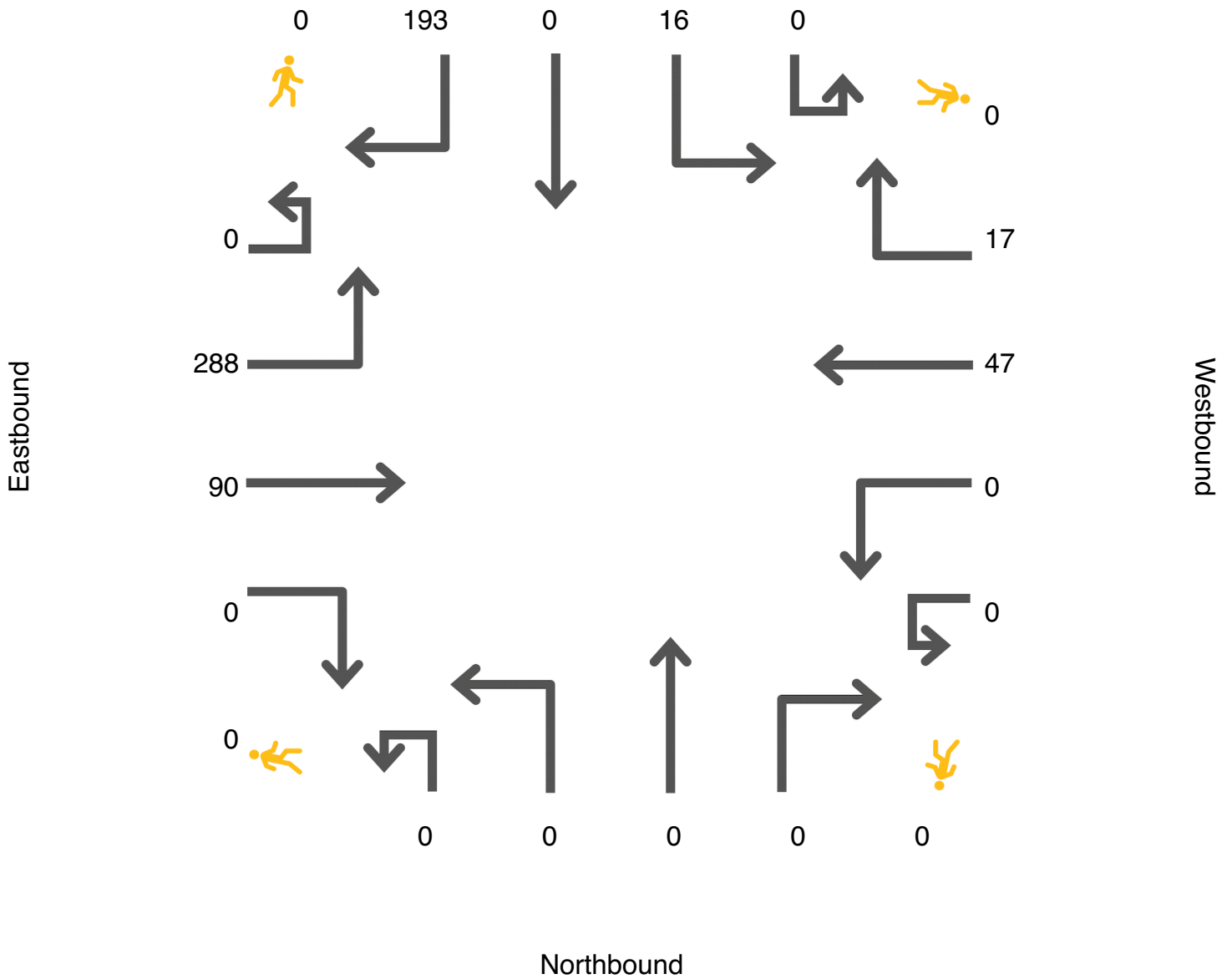
7. Appendix A – Intersection Counts



Turning Movement Count

Study Name: Mary's Mount PM
Date: Monday, Sep 19 2022
Location:
Observer:
Weather:
Comments: ""

Southbound



[illegible]

Light Trucks

		Westbound					Eastbound					Northbound					Southbound						
Start Time		Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Total All	
	4:00 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	5:00 PM	0	0	0	0	0	0	0	2	0	2	0	0	0	0	0	0	0	0	0	0	2	
	5:15 PM	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	2	
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	5:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total		0	0	0	0	0	0	0	3	0	3	2	0	0	0	2	0	0	0	0	0	5	

Heavy Trucks

		Westbound					Eastbound					Northbound					Southbound						
Start Time		Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Total All	
	4:00 PM	0	0	0	0	0	0	0	4	0	4	0	0	0	0	0	0	0	0	0	0	4	
	4:15 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	
	4:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	
	4:45 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	5:00 PM	0	0	0	0	0	0	0	1	0	1	1	1	0	0	2	0	0	0	0	0	3	
	5:15 PM	0	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	
	5:30 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	
	5:45 PM	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	
Total		0	0	0	0	0	1	0	6	0	7	1	1	0	0	2	0	2	1	0	3	12	

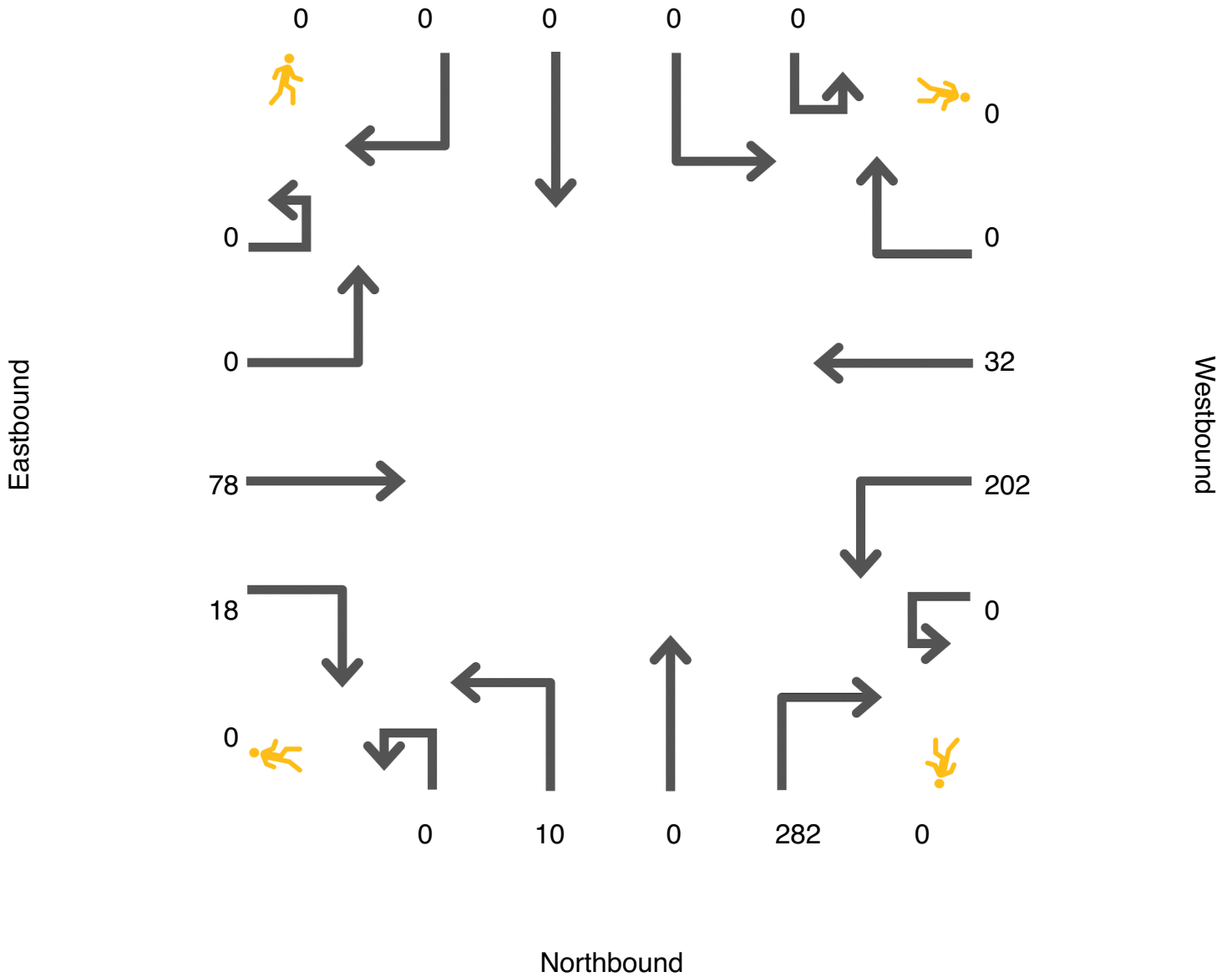
Pedestrians

[illegible]

Turning Movement Count

Study Name: Mary's mount PM
Date: Tuesday, Sep 20 2022
Location:
Observer:
Weather:
Comments: ""

Southbound



[illegible]

Light Trucks

Light Wave		Eastbound					Westbound					Southbound					Northbound					
		Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Total All
Signal	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	7:15 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	7:30 AM	1	0	2	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
	8:00 AM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	3
	8:15 AM	0	0	1	0	1	0	0	0	0	0	0	1	0	0	1	1	0	0	0	1	3
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	2
	8:45 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	1	0	6	0	7	0	0	0	0	0	0	2	0	0	2	5	0	0	0	5	14	

Heavy Trucks

		Eastbound					Westbound					Southbound					Northbound					
Start Time		Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Left	Thru	Right	UTurn	Total	Total All
	7:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
	7:15 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	2	3
	7:30 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	1
	7:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	8:00 AM	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	4	0	0	0	4	5
	8:15 AM	0	0	1	0	1	0	0	0	0	0	0	2	0	0	2	1	1	0	0	2	5
	8:30 AM	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1	
	8:45 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1
	9:00 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		0	0	3	0	3	0	0	0	0	0	0	3	0	0	3	8	3	0	0	11	17

Pedestrians

[illegible]

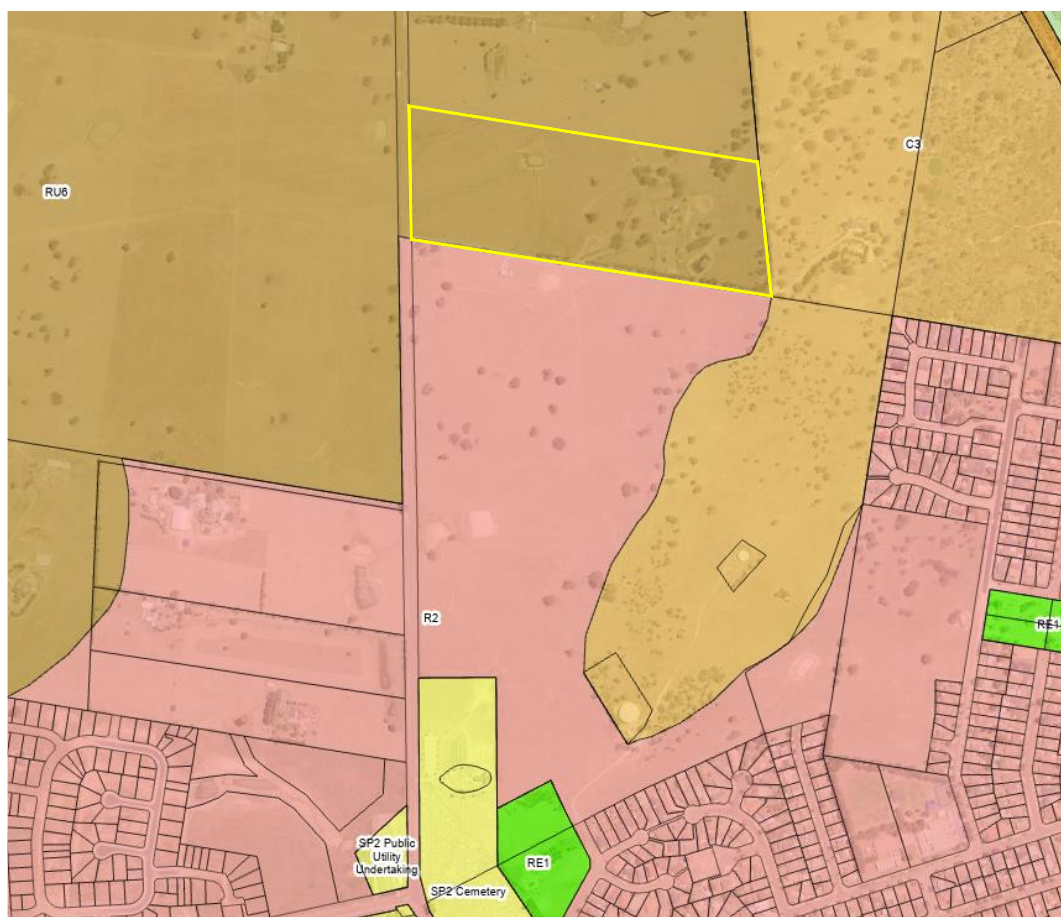
8. Appendix B – Plans of Proposed Subdivision

LAND REZONING PLANNING PROPOSAL

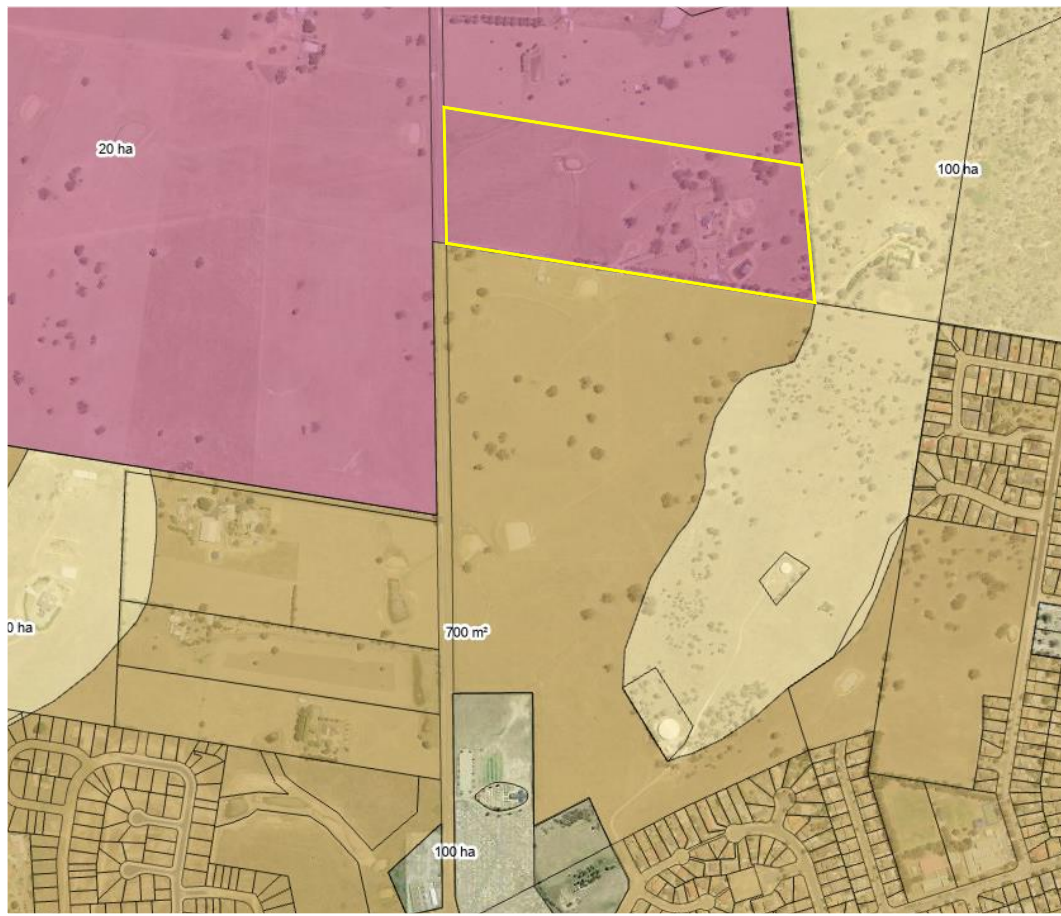
LOT 2 DP569505

44 MIDDLE ARM ROAD

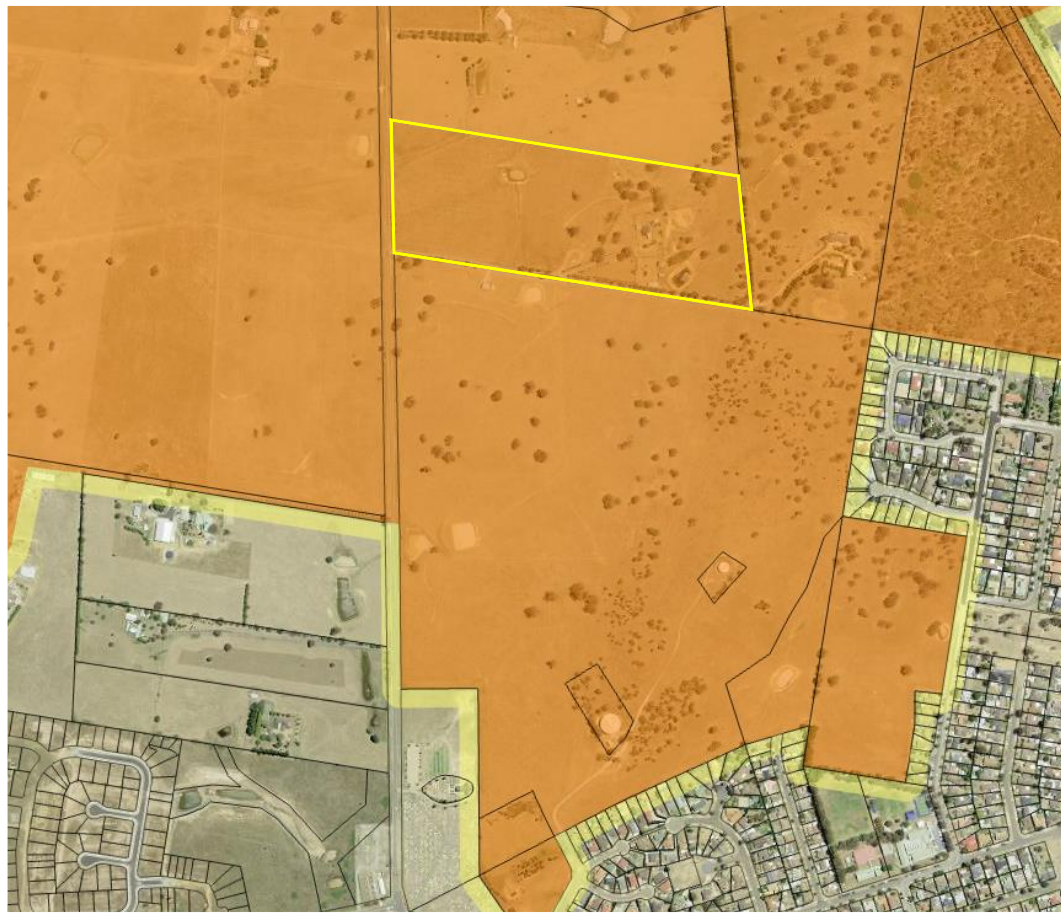
MIDDLE ARM. NSW. 2580



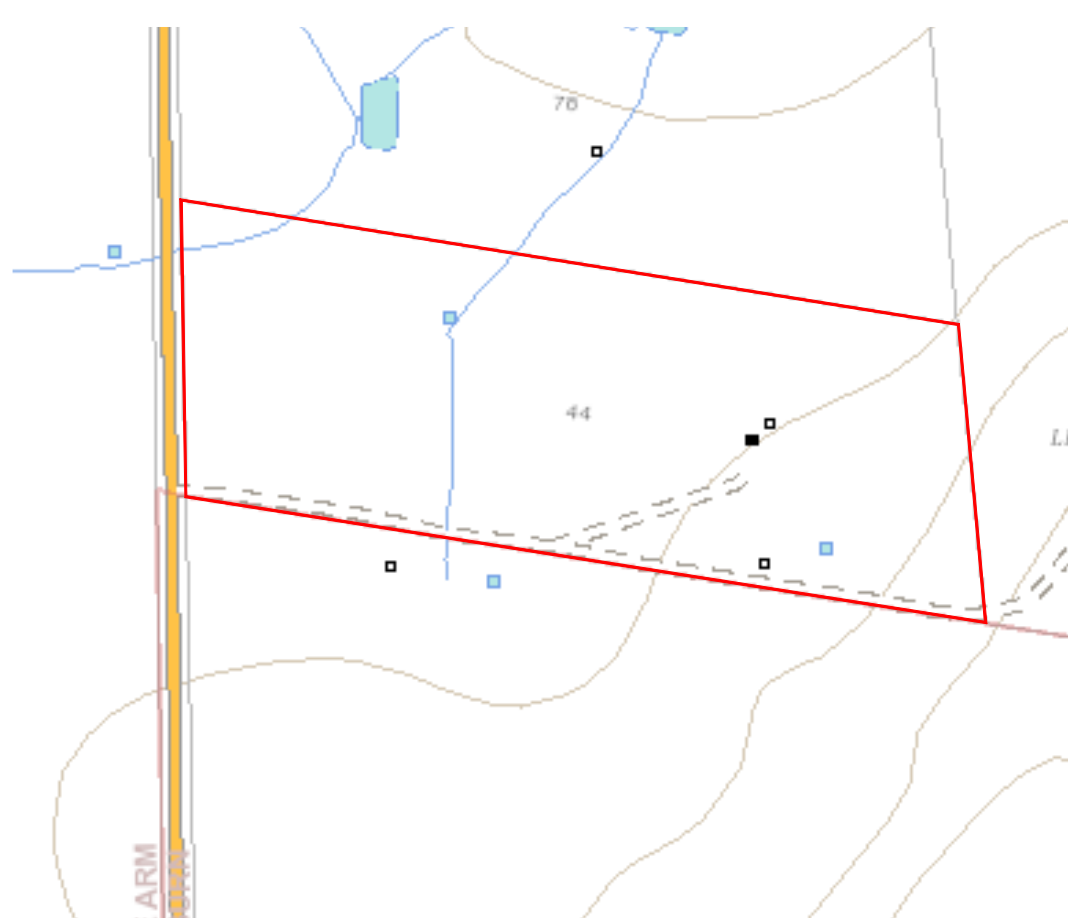
CURRENT LAND ZONING MAP WITHIN & AROUND THE SUBJECT SITE



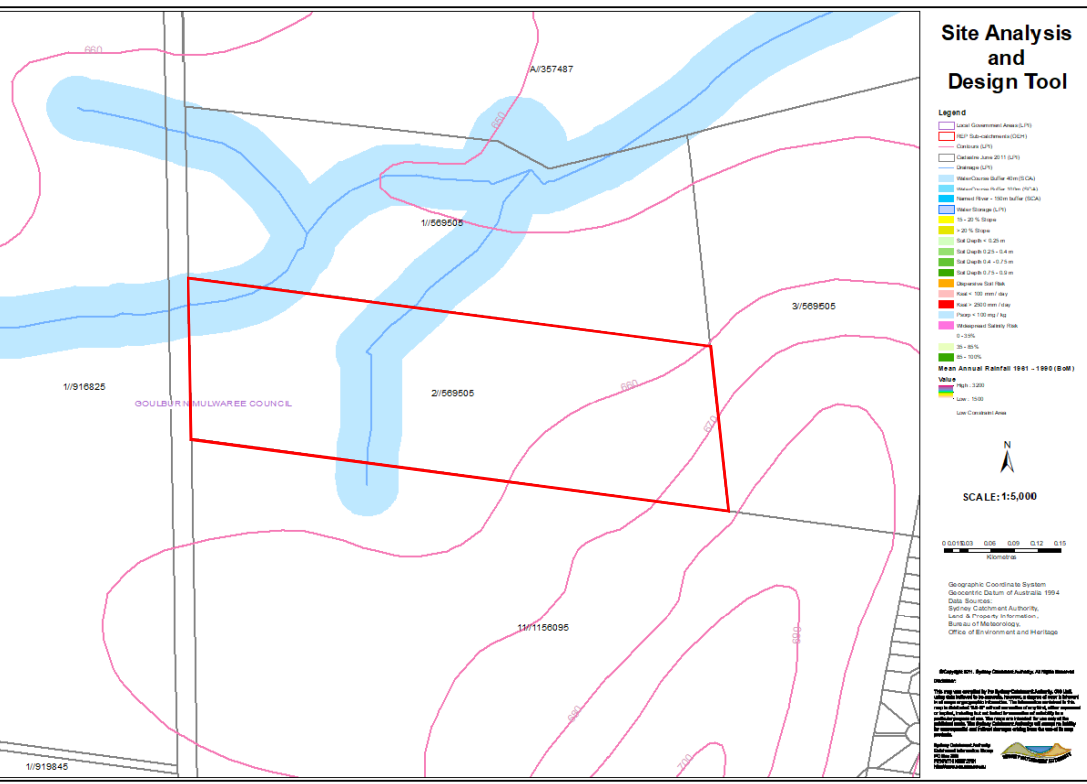
CURRENT LOT SIZE MAP WITHIN & AROUND THE SUBJECT SITE



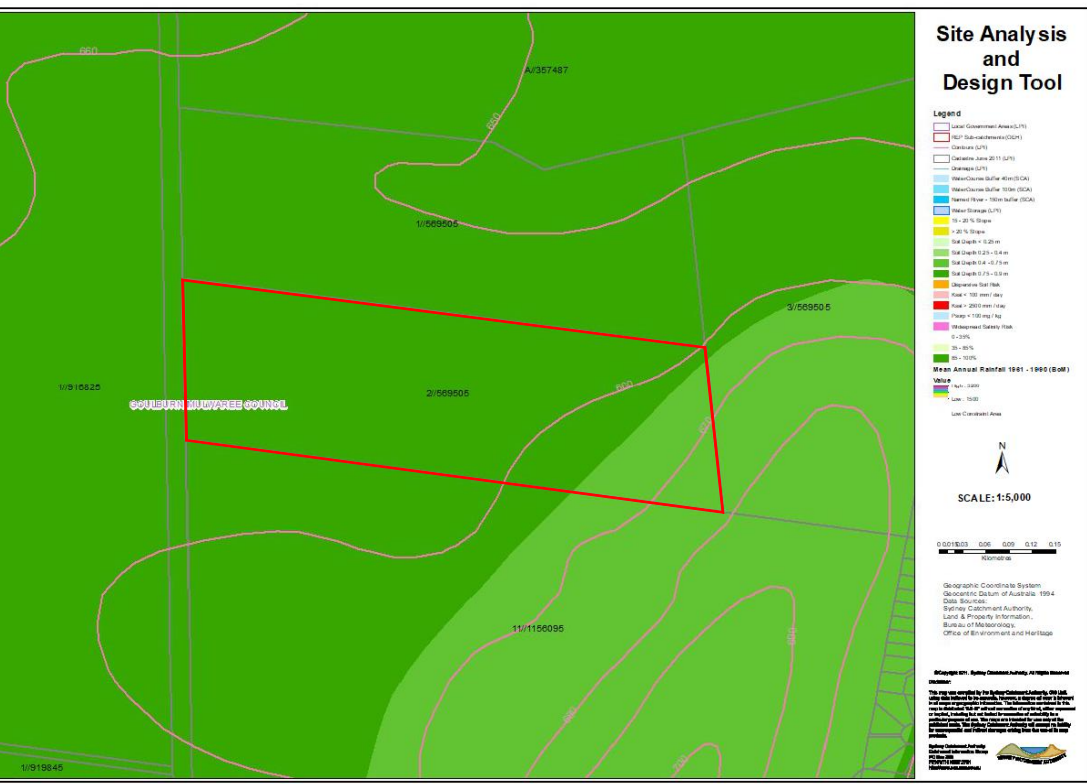
BUSH FIRE PRONE LANDS MAP WITHIN & AROUND THE SUBJECT SITE



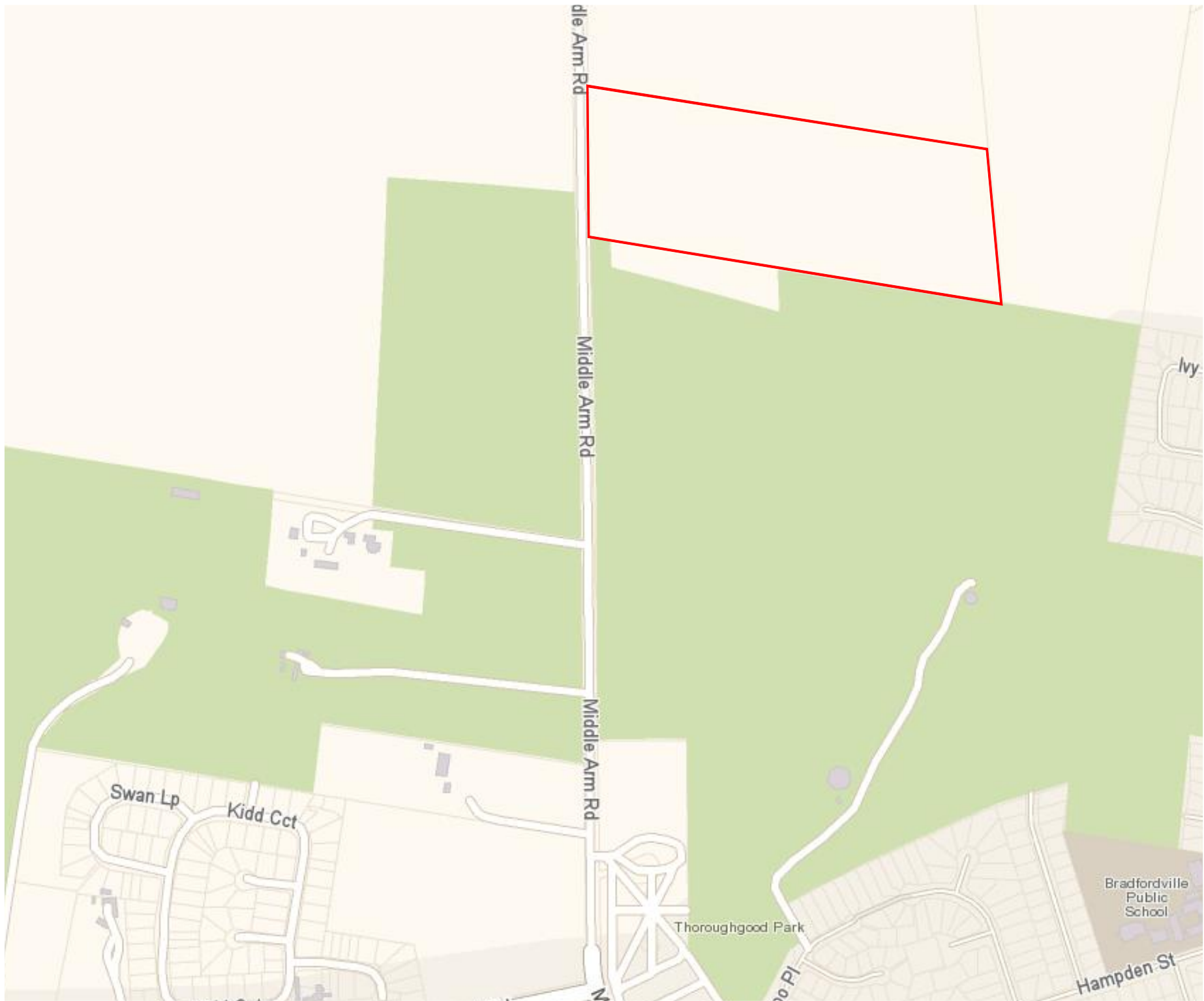
TOPOGRAPHICAL DETAILS ASSOCIATED WITH THE SUBJECT SITE



DRAINAGE CONSTRAINTS MAP WITH 40 METRE BUFFER ZONES



SOIL DEPTH CONSTRAINTS MAP



SCHEDULE OF DRAWINGS		
SHEET No.	DRAWING REFERENCE No.	DRAWING TITLE
1	0050723-01A	TITLE SHEET, LOCATION MAP AND GENERAL PLANNING & CONSTRAINT INSTRUMENTS
2	0050723-02A	EXISTING SITE CONDITION DETAILS
3	0050723-03A	PROPOSED SUBDIVISION LAYOUT & ROAD DESIGN DETAIL
4	0050723-04A	STORMWATER DRAINAGE & WATER MANAGEMENT SITE PLAN
5	0050723-05A	SEWER DRAINAGE & RETICULATED WATER SUPPLY SITE PLAN
6	0050723-06A	SEWER RISING MAIN & WATER SUPPLY EXTENSION SITE PLAN
7	0050723-07A	STRATEGIC BUSH FIRE STUDY - HAZARD ASSESSMENT SITE PLAN

DRAWING REFERENCE			PROJECT TITLE:	TITLE PARTICULARS:	DRAWING DATE:	SHEET NUMBER:
 P O Box 619 Goulburn NSW 2580 E: sowdes@sowdes.com M: 0481851403	ISSUE:		LAND REZONING PLANNING PROPOSAL	LOT 2 DP569505	Apr. 2023	1 of 7
	AMENDMENT DETAILS:				REFERENCE NUMBER:	DRAWN BY:
	A	PRELIMINARY PLAN - DRAFT ONLY			0050722	PJ
	DATE:	26/04/2023	DRAWING TITLE:	STREET ADDRESS:	DRAWING SCALE:	SHEET SIZE:
			TITLE SHEET, LOCATION MAP AND GENERAL PLANNING & CONSTRAINT INSTRUMENTS	44 MIDDLE ARM ROAD MIDDLE ARM. NSW. 2580		A1
					DRAWING REFERENCE NUMBER:	
					0050722-01A	

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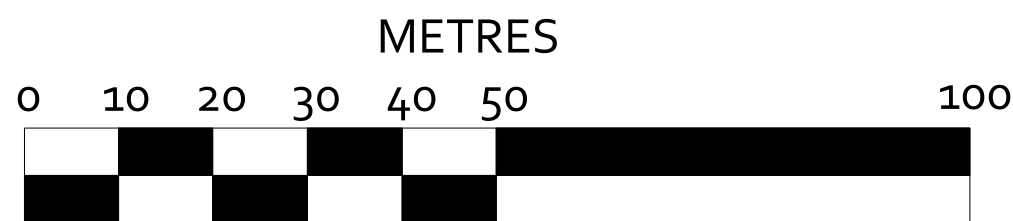


(A) EASEMENT FOR PIPELINE 24.385 WIDE (DP499022)
(C) EASEMENT FOR PIPELINE & WATER SUPPLY 20 WIDE (DP1159489)

- W 150 W 150 WATER SUPPLY LINES
- SEW SEW GRAVITY SEWER DRAINAGE LINES
- PS PS SEWER RISING MAIN - NOMINAL 90MM PE
- STORMWATER DRAINAGE - ROADS
- SW 375 SW 375 INTERALLOTMENT STORMWATER DRAINAGE
- SURFACE WATER DRAINAGE SWALES
- PEDESTRIAN FOOTPATHS
- VEGETATED BUFFER ZONES AROUND THE SITE
- DRAINAGE & STORMWATER MANAGEMENT

DRAWING REFERENCE			PROJECT TITLE:	TITLE PARTICULARS:	DRAWING DATE:	SHEET NUMBER:
ISSUE:	AMENDMENT DETAILS:	DATE:	LAND REZONING PLANNING PROPOSAL		Apr. 2023	3 of 7
A	PRELIMINARY PLAN - DRAFT ONLY	26/04/2023	DRAWING TITLE:	LOT 2 DP569505	REFERENCE NUMBER:	DRAWN BY:
			PROPOSED SUBDIVISION LAYOUT & ROAD DESIGN DETAIL	STREET ADDRESS:	0050722	PJ
				44 MIDDLE ARM ROAD	DRAWING SCALE:	SHEET SIZE:
				MIDDLE ARM. NSW. 2580	1:800	A1
					DRAWING REFERENCE NUMBER:	
					0050722-03A	

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MOVEMENT SUMMARY

Site: 101 [Middle Arm_Marys Mount_PM_Fut (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %	v/c	sec		[Veh. veh	Dist] m				km/h
South: Middle Arm Rd														
1	L2	126	9	133	7.1	0.112	5.6	LOS A	0.0	0.0	0.00	0.38	0.00	54.9
2	T1	67	2	71	3.0	0.112	0.0	LOS A	0.0	0.0	0.00	0.38	0.00	56.6
Approach		193	11	203	5.7	0.112	3.7	NA	0.0	0.0	0.00	0.38	0.00	55.5
North: Marys Mount Rd														
8	T1	63	5	66	7.9	0.046	0.2	LOS A	0.1	0.7	0.13	0.11	0.13	58.4
9	R2	14	0	15	0.0	0.046	6.2	LOS A	0.1	0.7	0.13	0.11	0.13	56.6
Approach		77	5	81	6.5	0.046	1.3	NA	0.1	0.7	0.13	0.11	0.13	58.1
West: Marys Mount Rd														
10	L2	22	0	23	0.0	0.015	5.7	LOS A	0.1	0.4	0.15	0.54	0.15	53.1
12	R2	175	5	184	2.9	0.177	6.4	LOS A	0.6	4.5	0.31	0.63	0.31	52.2
Approach		197	5	207	2.5	0.177	6.4	LOS A	0.6	4.5	0.29	0.62	0.29	52.3
All Vehicles		467	21	492	4.5	0.177	4.4	NA	0.6	4.5	0.14	0.44	0.14	54.5

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

INTERSECTION SUMMARY

▼ Site: 101 [Middle Arm_Marys Mount_AM_Ex (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	54.3 km/h	54.3 km/h
Travel Distance (Total)	356.4 veh-km/h	427.6 pers-km/h
Travel Time (Total)	6.6 veh-h/h	7.9 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.91	
Travel Time Index	8.95	
Congestion Coefficient	1.10	
Demand Flows (Total)	352 veh/h	422 pers/h
Percent Heavy Vehicles (Demand)	1.8 %	
Degree of Saturation	0.113	
Practical Spare Capacity	753.6 %	
Effective Intersection Capacity	3104 veh/h	
Control Delay (Total)	0.45 veh-h/h	0.54 pers-h/h
Control Delay (Average)	4.6 sec	4.6 sec
Control Delay (Worst Lane)	6.1 sec	
Control Delay (Worst Movement)	6.1 sec	6.1 sec
Geometric Delay (Average)	4.4 sec	
Stop-Line Delay (Average)	0.2 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	0.3 veh	
95% Back of Queue - Distance (Worst Lane)	2.3 m	
Ave. Queue Storage Ratio (Worst Lane)	0.00	
Total Effective Stops	164 veh/h	197 pers/h
Effective Stop Rate	0.47	0.47
Proportion Queued	0.08	0.08
Performance Index	7.6	7.6
Cost (Total)	283.64 \$/h	283.64 \$/h
Fuel Consumption (Total)	29.5 L/h	
Carbon Dioxide (Total)	69.6 kg/h	
Hydrocarbons (Total)	0.006 kg/h	
Carbon Monoxide (Total)	0.081 kg/h	
NOx (Total)	0.074 kg/h	

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

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 39.2% 5.5% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	168,758 veh/y	202,510 pers/y
Delay	217 veh-h/y	260 pers-h/y
Effective Stops	78,859 veh/y	94,630 pers/y
Travel Distance	171,053 veh-km/y	205,264 pers-km/y
Travel Time	3,150 veh-h/y	3,780 pers-h/y
Cost	136,147 \$/y	136,147 \$/y
Fuel Consumption	14,143 L/y	
Carbon Dioxide	33,416 kg/y	
Hydrocarbons	3 kg/y	
Carbon Monoxide	39 kg/y	

MOVEMENT SUMMARY

Site: 101 [Middle Arm_Marys Mount_AM_Ex (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Middle Arm Rd														
1	L2	156	0	164	0.0	0.113	5.6	LOS A	0.0	0.0	0.00	0.45	0.00	54.6
2	T1	46	0	48	0.0	0.113	0.0	LOS A	0.0	0.0	0.00	0.45	0.00	56.0
Approach		202	0	213	0.0	0.113	4.3	NA	0.0	0.0	0.00	0.45	0.00	54.9
North: Marys Mount Rd														
8	T1	22	1	23	4.5	0.017	0.2	LOS A	0.0	0.3	0.14	0.13	0.14	58.2
9	R2	6	0	6	0.0	0.017	6.1	LOS A	0.0	0.3	0.14	0.13	0.14	56.4
Approach		28	1	29	3.6	0.017	1.5	NA	0.0	0.3	0.14	0.13	0.14	57.8
West: Marys Mount Rd														
10	L2	7	0	7	0.0	0.005	5.7	LOS A	0.0	0.1	0.12	0.54	0.12	53.2
12	R2	97	5	102	5.2	0.094	6.1	LOS A	0.3	2.3	0.24	0.59	0.24	52.2
Approach		104	5	109	4.8	0.094	6.1	LOS A	0.3	2.3	0.23	0.59	0.23	52.3
All Vehicles		334	6	352	1.8	0.113	4.6	NA	0.3	2.3	0.08	0.47	0.08	54.3

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

INTERSECTION SUMMARY

▼ Site: 101 [Middle Arm_Marys Mount_AM_Fut (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	54.9 km/h	54.9 km/h
Travel Distance (Total)	454.5 veh-km/h	545.4 pers-km/h
Travel Time (Total)	8.3 veh-h/h	9.9 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.92	
Travel Time Index	9.06	
Congestion Coefficient	1.09	
Demand Flows (Total)	448 veh/h	538 pers/h
Percent Heavy Vehicles (Demand)	1.4 %	
Degree of Saturation	0.120	
Practical Spare Capacity	684.7 %	
Effective Intersection Capacity	3728 veh/h	
Control Delay (Total)	0.51 veh-h/h	0.61 pers-h/h
Control Delay (Average)	4.1 sec	4.1 sec
Control Delay (Worst Lane)	6.5 sec	
Control Delay (Worst Movement)	6.5 sec	6.5 sec
Geometric Delay (Average)	3.7 sec	
Stop-Line Delay (Average)	0.3 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	0.3 veh	
95% Back of Queue - Distance (Worst Lane)	2.5 m	
Ave. Queue Storage Ratio (Worst Lane)	0.00	
Total Effective Stops	182 veh/h	218 pers/h
Effective Stop Rate	0.41	0.41
Proportion Queued	0.12	0.12
Performance Index	9.6	9.6
Cost (Total)	354.83 \$/h	354.83 \$/h
Fuel Consumption (Total)	35.9 L/h	
Carbon Dioxide (Total)	84.8 kg/h	
Hydrocarbons (Total)	0.007 kg/h	
Carbon Monoxide (Total)	0.100 kg/h	
NOx (Total)	0.078 kg/h	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Site Model Variability Index (Iterations 3 to N): 0.0 %
 Number of Iterations: 3 (Maximum: 10)
 Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 44.1% 6.7% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	215,242 veh/y	258,291 pers/y
Delay	245 veh-h/y	294 pers-h/y
Effective Stops	87,339 veh/y	104,807 pers/y
Travel Distance	218,158 veh-km/y	261,789 pers-km/y
Travel Time	3,971 veh-h/y	4,766 pers-h/y
Cost	170,320 \$/y	170,320 \$/y
Fuel Consumption	17,239 L/y	
Carbon Dioxide	40,692 kg/y	
Hydrocarbons	3 kg/y	
Carbon Monoxide	48 kg/y	

MOVEMENT SUMMARY

Site: 101 [Middle Arm_Marys Mount_AM_Fut (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Middle Arm Rd														
1	L2	156	0	164	0.0	0.120	5.6	LOS A	0.0	0.0	0.00	0.43	0.00	54.8
2	T1	59	0	62	0.0	0.120	0.0	LOS A	0.0	0.0	0.00	0.43	0.00	56.2
Approach		215	0	226	0.0	0.120	4.0	NA	0.0	0.0	0.00	0.43	0.00	55.2
North: Marys Mount Rd														
8	T1	78	1	82	1.3	0.060	0.3	LOS A	0.2	1.2	0.17	0.14	0.17	58.0
9	R2	24	0	25	0.0	0.060	6.2	LOS A	0.2	1.2	0.17	0.14	0.17	56.2
Approach		102	1	107	1.0	0.060	1.7	NA	0.2	1.2	0.17	0.14	0.17	57.6
West: Marys Mount Rd														
10	L2	12	0	13	0.0	0.008	5.7	LOS A	0.0	0.2	0.14	0.53	0.14	53.2
12	R2	97	5	102	5.2	0.102	6.5	LOS A	0.3	2.5	0.31	0.63	0.31	52.0
Approach		109	5	115	4.6	0.102	6.4	LOS A	0.3	2.5	0.29	0.62	0.29	52.2
All Vehicles		426	6	448	1.4	0.120	4.1	NA	0.3	2.5	0.12	0.41	0.12	54.9

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

INTERSECTION SUMMARY

Site: 101 [Middle Arm_Marys Mount_PM_Ex (Site Folder: General)]

New Site

Site Category: (None)

Give-Way (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	53.8 km/h	53.8 km/h
Travel Distance (Total)	408.3 veh-km/h	490.0 pers-km/h
Travel Time (Total)	7.6 veh-h/h	9.1 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.90	
Travel Time Index	8.86	
Congestion Coefficient	1.11	
Demand Flows (Total)	403 veh/h	484 pers/h
Percent Heavy Vehicles (Demand)	5.5 %	
Degree of Saturation	0.166	
Practical Spare Capacity	382.9 %	
Effective Intersection Capacity	2433 veh/h	
Control Delay (Total)	0.55 veh-h/h	0.66 pers-h/h
Control Delay (Average)	4.9 sec	4.9 sec
Control Delay (Worst Lane)	6.1 sec	
Control Delay (Worst Movement)	6.1 sec	6.1 sec
Geometric Delay (Average)	4.6 sec	
Stop-Line Delay (Average)	0.3 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	0.6 veh	
95% Back of Queue - Distance (Worst Lane)	4.3 m	
Ave. Queue Storage Ratio (Worst Lane)	0.00	
Total Effective Stops	196 veh/h	235 pers/h
Effective Stop Rate	0.49	0.49
Proportion Queued	0.13	0.13
Performance Index	9.0	9.0
Cost (Total)	339.49 \$/h	339.49 \$/h
Fuel Consumption (Total)	39.2 L/h	
Carbon Dioxide (Total)	93.5 kg/h	
Hydrocarbons (Total)	0.007 kg/h	
Carbon Monoxide (Total)	0.102 kg/h	
NOx (Total)	0.196 kg/h	

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

NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Site Model Variability Index (Iterations 3 to N): 0.0 %

Number of Iterations: 3 (Maximum: 10)

Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 38.9% 2.7% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	193,516 veh/y	232,219 pers/y
Delay	263 veh-h/y	315 pers-h/y
Effective Stops	94,134 veh/y	112,961 pers/y
Travel Distance	195,987 veh-km/y	235,184 pers-km/y
Travel Time	3,641 veh-h/y	4,369 pers-h/y
Cost	162,956 \$/y	162,956 \$/y
Fuel Consumption	18,827 L/y	
Carbon Dioxide	44,866 kg/y	
Hydrocarbons	4 kg/y	
Carbon Monoxide	49 kg/y	

MOVEMENT SUMMARY

▼ Site: 101 [Middle Arm_Marys Mount_PM_Ex (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] veh/h	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Middle Arm Rd														
1	L2	126	9	133	7.1	0.084	5.6	LOS A	0.0	0.0	0.00	0.51	0.00	53.8
2	T1	16	2	17	12.5	0.084	0.0	LOS A	0.0	0.0	0.00	0.51	0.00	55.5
Approach		142	11	149	7.7	0.084	5.0	NA	0.0	0.0	0.00	0.51	0.00	53.9
North: Marys Mount Rd														
8	T1	51	5	54	9.8	0.036	0.1	LOS A	0.1	0.5	0.09	0.10	0.09	58.6
9	R2	10	0	11	0.0	0.036	6.0	LOS A	0.1	0.5	0.09	0.10	0.09	56.8
Approach		61	5	64	8.2	0.036	1.1	NA	0.1	0.5	0.09	0.10	0.09	58.3
West: Marys Mount Rd														
10	L2	5	0	5	0.0	0.003	5.6	LOS A	0.0	0.1	0.07	0.55	0.07	53.4
12	R2	175	5	184	2.9	0.166	6.1	LOS A	0.6	4.3	0.25	0.60	0.25	52.3
Approach		180	5	189	2.8	0.166	6.1	LOS A	0.6	4.3	0.24	0.60	0.24	52.4
All Vehicles		383	21	403	5.5	0.166	4.9	NA	0.6	4.3	0.13	0.49	0.13	53.8

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

INTERSECTION SUMMARY

▼ Site: 101 [Middle Arm_Marys Mount_PM_Fut (Site Folder: General)]

New Site
Site Category: (None)
Give-Way (Two-Way)

Intersection Performance - Hourly Values		
Performance Measure	Vehicles	Persons
Travel Speed (Average)	54.5 km/h	54.5 km/h
Travel Distance (Total)	497.9 veh-km/h	597.5 pers-km/h
Travel Time (Total)	9.1 veh-h/h	11.0 pers-h/h
Desired Speed (Program)	60.0 km/h	
Speed Efficiency	0.91	
Travel Time Index	8.98	
Congestion Coefficient	1.10	
Demand Flows (Total)	492 veh/h	590 pers/h
Percent Heavy Vehicles (Demand)	4.5 %	
Degree of Saturation	0.177	
Practical Spare Capacity	352.6 %	
Effective Intersection Capacity	2781 veh/h	
Control Delay (Total)	0.60 veh-h/h	0.72 pers-h/h
Control Delay (Average)	4.4 sec	4.4 sec
Control Delay (Worst Lane)	6.4 sec	
Control Delay (Worst Movement)	6.4 sec	6.4 sec
Geometric Delay (Average)	4.0 sec	
Stop-Line Delay (Average)	0.4 sec	
Idling Time (Average)	0.0 sec	
Intersection Level of Service (LOS)	NA	
95% Back of Queue - Vehicles (Worst Lane)	0.6 veh	
95% Back of Queue - Distance (Worst Lane)	4.5 m	
Ave. Queue Storage Ratio (Worst Lane)	0.00	
Total Effective Stops	214 veh/h	257 pers/h
Effective Stop Rate	0.44	0.44
Proportion Queued	0.14	0.14
Performance Index	10.7	10.7
Cost (Total)	403.97 \$/h	403.97 \$/h
Fuel Consumption (Total)	45.0 L/h	
Carbon Dioxide (Total)	107.0 kg/h	
Hydrocarbons (Total)	0.008 kg/h	
Carbon Monoxide (Total)	0.119 kg/h	
NOx (Total)	0.200 kg/h	

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
 NA: Intersection LOS for Vehicles is Not Applicable for two-way sign control since the average intersection delay is not a good LOS measure due to zero delays associated with major road movements.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Site Model Variability Index (Iterations 3 to N): 0.0 %
 Number of Iterations: 3 (Maximum: 10)
 Largest change in Lane Degrees of Saturation for the last three Flow-Capacity Iterations: 42.7% 4.2% 0.0%

Intersection Performance - Annual Values		
Performance Measure	Vehicles	Persons
Demand Flows (Total)	235,958 veh/y	283,150 pers/y
Delay	290 veh-h/y	348 pers-h/y
Effective Stops	102,948 veh/y	123,537 pers/y
Travel Distance	239,007 veh-km/y	286,809 pers-km/y
Travel Time	4,388 veh-h/y	5,265 pers-h/y
Cost	193,908 \$/y	193,908 \$/y
Fuel Consumption	21,592 L/y	
Carbon Dioxide	51,346 kg/y	
Hydrocarbons	4 kg/y	
Carbon Monoxide	57 kg/y	