



Traffic Impact Assessment

Residential Subdivision

Gregadoo Road

Lake Albert, NSW

March 2020

Prepared by:

Spotto CONSULTING

For:

Larzie Jay Pty Ltd

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1 INTRODUCTION

Spotto Consulting have been engaged by Larzie Jay Pty Ltd to complete a Traffic Impact Assessment. The study is in response to a proposed development on Gregadoo Road, Lake Albert (on the southern side, roughly between Plunkett Drive and Angela Road). The proposed development involves subdivision of the existing 31 lots into 141 rural residential lots, including construction of a new internal road network, extending Tallowood Crescent and including a new T-junction to the west to access the area via Gregadoo Road between Lakehaven Drive and Plunkett Drive.

The purpose of the assessment is to review the existing conditions in the vicinity of the site, as well as the performance of the surrounding network. An evaluation is then required of the traffic requirements for the proposed development, and the impacts on the surrounding road network.

The assessment concluded that:

- Traffic surveys and modelling of the existing intersection of Gregadoo Road and Tallowood Crescent show that the intersection currently operates at an excellent Level of Service (LOS A, the highest level), with midblock level of service on Gregadoo Road and Tallowood Crescent Wagga Road south of the site also being excellent (LOS A);
- The proposed development involves increasing the number of lots from 31 to 141 (an increase of 110 lots), as well as construction of an internal road network and new intersection with Gregadoo Road;
- The proposed development will result in an increase in traffic volume of 814 vehicles per day (78 in the AM peak period and 86 in the PM peak period);
- There is sufficient capacity in the surrounding road network and key intersections to accommodate the additional traffic generated by the proposed development, in addition to catering for the next ten years growth in existing traffic volumes on the surrounding road network. Modelling shows that intersections and midblock levels of service will operate at either an excellent or good level of service (LOS A or B);
- Parking requirements can be met by providing off-street parking in accordance with the Wagga Wagga Development Control Plan 2010;
- Adequate provision has been made for public transport and school buses; and
- There will be no significant adverse impact on the movement of pedestrians and cyclists.

The assessment recommended that:

- The intersection of Gregadoo Road and Tallowood Crescent be upgraded to incorporate auxiliary turning lanes, including a Short Channelised Right Turn (CHR(S)) and Basic Left Turn (BAL); and
- The intersection of Gregadoo Road and the new western access road into the subdivision be designed and constructed to incorporate auxiliary turning lanes, including a Short Channelised Right Turn (CHR(S)) and Basic Left Turn (BAL).

2 EXISTING CONDITIONS

2.1 Site

The site is located approximately 8km south of the Wagga Wagga CBD, in the suburb of Lake Albert. The site is located on the southern side of Gregadoo Road, roughly between Plunkett Drive and Angela Road. Figure 2-1 shows the location of the site.



Figure 2-1: Locality Plan

The site comprises a total of 31 existing lots with a total area of approximately 77.8 hectares and is bounded by Gregadoo Road to the north, The Grange Lifestyle Village to the west and by private land to the east and south. Fourteen of the lots within the site are currently accessed from Gregadoo Road, while a further 17 are accessed from Tallowood Crescent (which intersects with Gregadoo Road between Lakehaven Drive and Angela Road).

2.2 Surrounding Land Use

The site is currently zoned a mix of R5 Large Lot Residential and RU1 Primary Production under the Wagga Wagga Local Environmental Plan 2010 (Wagga Wagga LEP). Other land to the north, east and west is generally zoned R5 Large Lot Residential (with some recreational zoning), while land to the south is generally zoned RU1 Primary Production. Land use reflects this zoning, with a mixture of residential housing and rural/rural residential properties. Figure

2-2, extracted from the Wagga Wagga LEP, shows the land zonings for the site and surrounding areas.

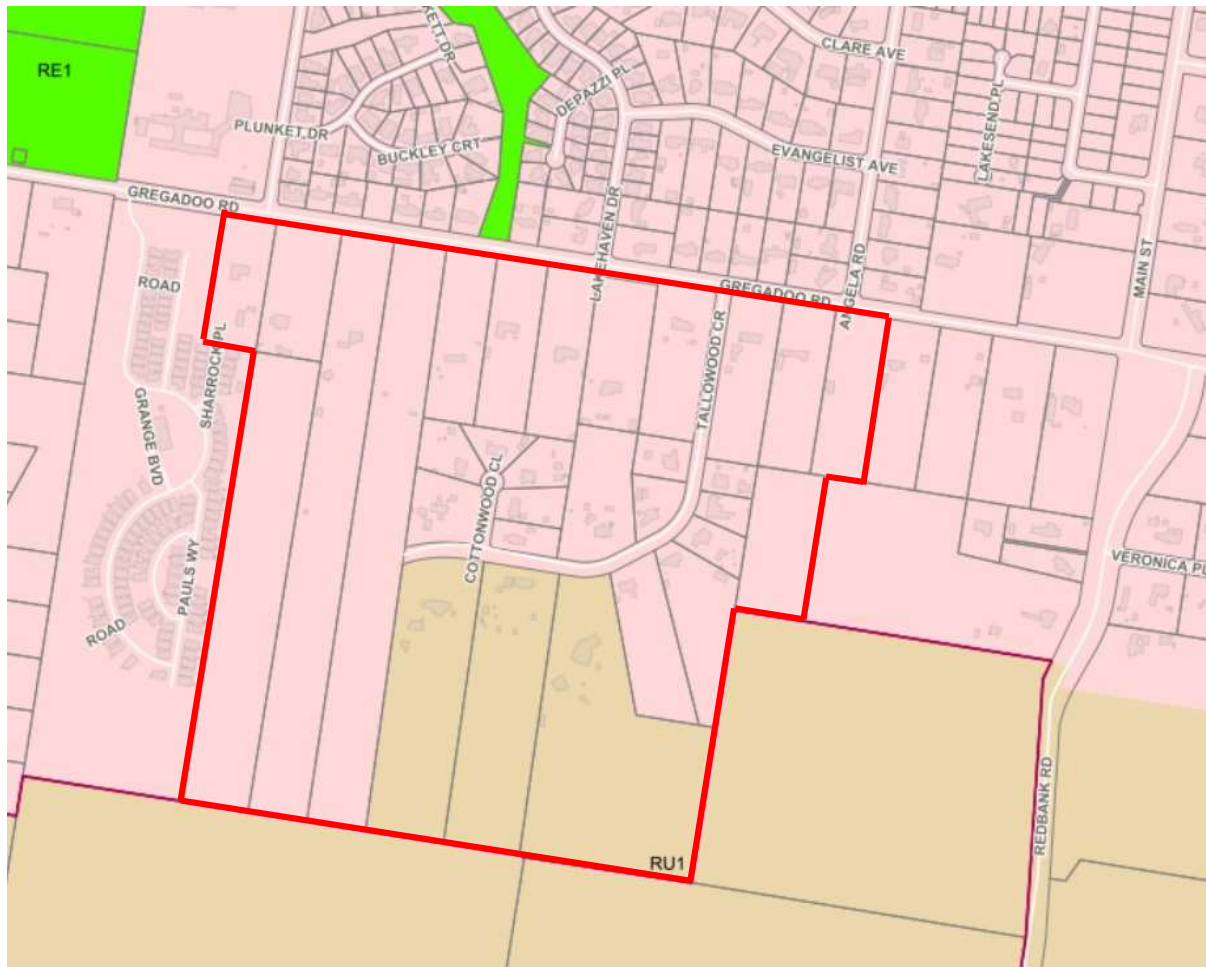


Figure 2-2: Land zoning for site and surrounds
(Source: City of Wagga Wagga)

2.3 Road Network

2.3.1 Gregadoo Road

Gregadoo Road is an important east-west road in the local road network. It spans the southern part of the suburb of Lake Albert, between Plumpton Road and Mitchell Road. It is a local road under the control of the City of Wagga Wagga.

In the vicinity of the site, Gregadoo Road is a two-lane, two-way sealed rural road that runs roughly east-west and defines the northern boundary of the site. With a variable road reserve width (25-30m), Gregadoo Road has a 7.0m wide sealed carriageway with widening near some intersections for auxiliary lanes. Grassed verges on either side contain table drains for conveying stormwater runoff. Overhead power lines are located along the southern side (typically 4m from the edge of the carriageway), and street lighting is present only at key intersections. There are no facilities for pedestrians or cyclists such as paths or bike lanes. The speed limit is 60km/h in the vicinity of the site.

Gregadoo Road acts as a Collector road in the local road network, linking local roads to arterial and sub-arterial roads. Direct access into properties is available along the route, and the road's role balances through movement and access.

Gregadoo Road is identified for upgrade works in Council's *Local Infrastructure Contributions Plan 2019-2034*, in order to cater for growth in traffic volumes associated with development in the area. The document identifies improvements to the road and intersections, including Tallowood Crescent. Concept design plans from 2017 were provided by Council, which indicate the road is to be widened to a 10.0m wide pavement, incorporating two 3.5m-wide travel lanes with a 1.5m-wide bicycle lane/shoulder (plus further widening for auxiliary turning lanes at key intersections).



Figure 2-3: Looking west along Gregadoo Road, with the intersection of Tallowood Crescent on the left



Figure 2-4: Looking west along Gregadoo Road in the vicinity of the proposed new intersection to service the proposed development

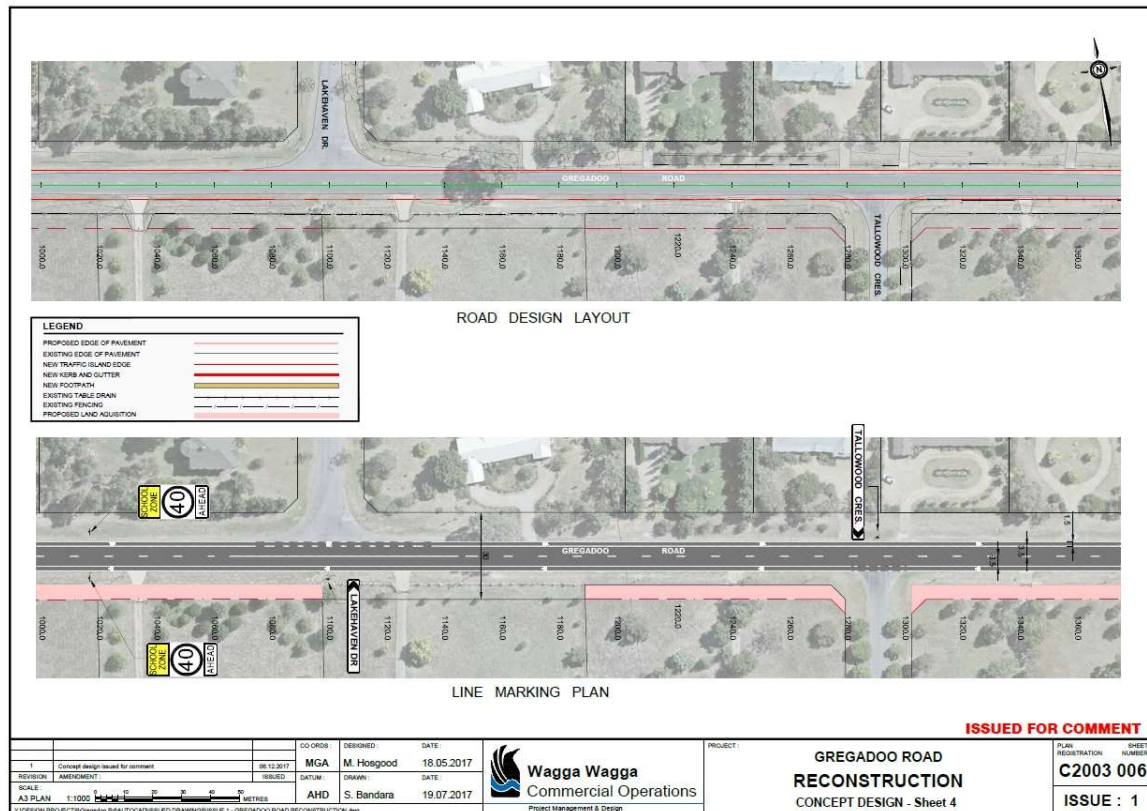


Figure 2-5: Gregadoo Road Reconstruction – Concept Design – Plan
(Source: City of Wagga Wagga)

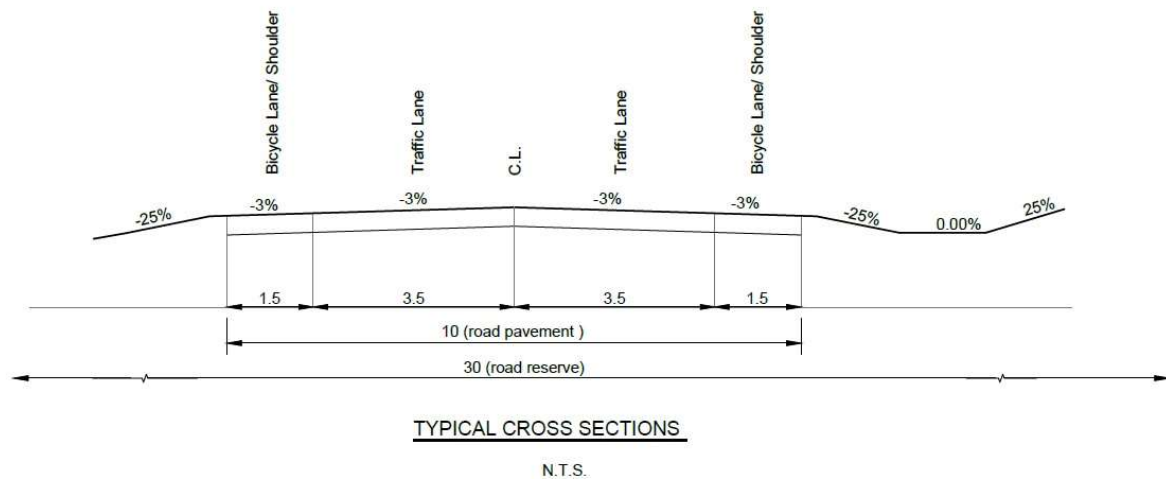


Figure 2-6: Gregadoo Road Reconstruction – Concept Design – Typical Cross Section
(Source: City of Wagga Wagga)

2.3.2 Tallowood Crescent and Cottonwood Close

Tallowood Crescent and Cottonwood Close are existing roads within the area of the proposed development. Tallowood Crescent intersects with Gregadoo Road at a T-junction, running south and then west for approximately 800m. Cottonwood Crescent intersects with Tallowood Crescent at a T-junction, running north for approximately 100m. Both roads are local roads under the control of the City of Wagga Wagga.

Tallowood Crescent and Cottonwood Close are two-lane, two-way sealed rural residential roads. Contained within 23m-wide easements, both roads have 6.5m wide sealed carriageways. Grassed verges on either side contain table drains for conveying stormwater runoff, as well as street trees offset 3m from the edge of the carriageway. There is no overhead power or street lighting, nor are there dedicated facilities for pedestrians or cyclists. The speed limit on both roads is 50km/h.

With no connectivity through to other roads, and direct access available to properties, Tallowood Crescent and Cottonwood Close favour access over through movement.



Figure 2-7: Looking south along Tallowood Crescent



Figure 2-8: Looking north along Cottonwood Close

2.4 Existing Traffic Conditions

2.4.1 Data Collection

Traffic data was provided by the City of Wagga Wagga, which comprised Metrocount traffic surveys undertaken on Gregadoo Road between Plunkett Drive and Lakehaven Drive (west of the site) in July and August 2017.

Turning movement surveys were undertaken at the intersections of Gregadoo Road with Tallowood Crescent and also Lakehaven Drive on Tuesday 18 February 2020. This was within NSW school term dates. Surveys were undertaken during the morning and afternoon peak periods between 8:00AM-9:30AM and 4:00PM-5:30PM. This allowed the peak hour within each period to be determined, and also allowed the directional split of traffic across the day to be evaluated.

2.4.2 Intersections

The turning movements for the busiest one-hour period in the AM Peak (8:00-9:00AM) and PM Peak (4:30PM-5:30PM) periods are summarised in Figure 2-9 and Figure 2-10 (below) for the intersections of Gregadoo Road with Tallowood Crescent, Lakehaven Drive and the location of the future intersection for the proposed development.

AM Peak 0815-0915 Existing Traffic Volumes											
New Intersection				Lakehaven Drive				Tallowood Crescent			
Gregadoo Rd (W)				Gregadoo Rd (W)				Gregadoo Rd (W)			
202 >				14 ^				191 >			
0 v				188 >				3 v			

2.4.3 Midblock

As noted in Section 2.4.1, existing mid-block traffic data was provided by the City of Wagga Wagga for Gregadoo Road between Plunkett Drive and Lakehaven Drive. This data from 2017 is able to be compared with information extracted for the same section of Gregadoo Road from the turning movement counts undertaken in 2020 by Spotto Consulting. A summary of this comparison, including weekday traffic volumes (in vehicles per day) and peak hour traffic volumes (in vehicles per hour), is provided in Table 2-2, below.

Table 2-2: Midblock traffic data – Gregadoo Road (Plunkett Dr to Lakehaven Dr)

Data Source	Weekday	Weekday AM Peak	Weekday PM Peak
	Veh/d	Veh/h	Veh/h
Council Midblock Counts*	2,982	429	278
Eastbound		182	144
Westbound		247	134
Spotto Turn Counts	2,850 [#]	421	263
Eastbound		202	129
Westbound		219	134

* Council midblock counts have been increased by 2% pa for three years to represent growth in traffic volumes between 2017 and 2020

[#] Daily midblock traffic volume from turning count data is determined by taking the average of the AM and PM peak hour and assuming this represents 12% of the total daily volume (as observed in Council midblock counts)

Table 2-2 shows that in general, two-way peak hour and daily traffic volumes from both sources are within +/- 10% of each other, indicating both data sources are comparable and provide a good indication of existing traffic volumes. Based on the 2020 turning movement counts, a summary of the midblock data for the key sections of roads in the vicinity of the site, including weekday traffic volumes (in vehicles per day), peak hour traffic volumes (in vehicles per hour) and Level of Service (LOS) is provided in Table 2-3 below.

Table 2-3: Midblock traffic data – existing conditions

Location	Weekday	Weekday AM Peak		Weekday PM Peak	
	Veh/d	Veh/h	LOS	Veh/h	LOS
Gregadoo Road (Tallowood to Lakehaven)	2,513	380		223	
Eastbound		194	A	102	A
Westbound		186	A	121	A
Tallowood Crescent (South of Gregadoo)	104	11		14	
Northbound		6	A	3	A
Southbound		5	A	11	A

Note: Level of Service calculated based on typical midblock capacities for two-lane, two-way roads from Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis.

The level of service for both Gregadoo Road and Tallowood Crescent in the vicinity of the site is excellent, operating at the highest level (A), indicating that the roads have adequate midblock capacity at present;

2.5 Public Transport

Public buses operate in the Wagga Wagga area, with a total of nine town route services operated by Busabout. The 960 route connects Wagga Wagga's southern suburbs to the train station and CBD, and travels approximately 1km north of the site.

From the CBD, passengers can transfer on to other town bus services to connect to other parts of Wagga Wagga. Buses and rail services also provide regional public transport services to locations such as Albury, Melbourne, Sydney and Adelaide, and are accessible from the Wagga Wagga Train Station, which is located approximately 7km north of the site.

It is also noted that school bus services operate along Gregadoo Road in the morning and afternoon peak periods. These operate on a "hail and ride" basis, with pick-up and drop-off points based on student demand location rather than using dedicated bus stops.

2.6 Pedestrians and Cyclists

There are no dedicated facilities for pedestrians or cyclists either within the site or along Gregadoo Road in the vicinity of the site. Pedestrians and cyclists must travel on-road or on the road verge (where possible) in these areas.

Council do not have any specific plans to provide off-road facilities for pedestrians or cyclists, although as noted in Section 2.3.1, the upgrade of Gregadoo Road will incorporate a 1.5m-wide sealed shoulder suitable for on-road use by cyclists.

3 PROPOSED DEVELOPMENT

The proposed development involves rezoning parts of the site and subdividing to create a total of 141 lots from the existing 31, resulting in an additional 110 lots. Each lot will allow for construction of a single residential property, with some of the existing properties to remain.

An internal road network will be constructed, extending Tallowood Crescent and including a new T-junction to the west to access the area via Gregadoo Road between Lakehaven Drive and Plunkett Drive (near the current boundary between 64 and 66 Gregadoo Road). At present 14 lots access directly onto Gregadoo Road: this will reduce to 10 following completion of the subdivision. The remaining 131 lots will access the site via Gregadoo Road from either Tallowood Crescent or the new western intersection.

Plans of the proposed development (MJM Consulting Engineers Project 170065 – Issue H – 21 February 2020) are included below.

No.	DATE	AMENDMENTS	BY
E	12/02/2019	ISSUED FOR COMMENT - 4500m ²	MJ
F	15/04/2019	ISSUED FOR COMMENT - 4000m ²	MJ
G	19/12/2019	ISSUED FOR COMMENT	MJ
H	21/02/2020	ISSUED FOR COMMENT	MJ

Filename: C:\70065\Prdtn\11.dwg

PROJECT
PROPOSED SUBDIVISION
68 GREGADOO ROAD
LAKE ALBERT NSW 2650

SHEET SUBJECT

OVERALL PLAN

CLIENT
LARZIE JAY PTY LTD

PROJECT NO.	SHEET NO.	ISSUE	DATE
170065	C1	H	Feb 2020
COUNCIL REF.			SCALE
			1:2500 (A1) 1:5000 (A3)

	DESIGNED	CHECKED	DRAWN	CHECKED
	MM		NJ	

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I HEREBY CERTIFY THAT ENGINEERING WORKS AS SHOWN ON THIS PLAN ARE WORK AS EXECUTED AND HAVE BEEN CONSTRUCTED GENERALLY IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS APPROVED BY THE DIRECTOR, IN ACCORDANCE WITH THE GENERAL REQUIREMENTS OF THE LOCAL COUNCIL.

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SIGNATURE:

CAPACITY: Director

DATE:



4 IMPACT OF PROPOSED DEVELOPMENT

4.1 Road Network

4.1.1 Traffic Generation and Distribution

Traffic generation levels for proposed developments are typically determined by reference to published standards such as the *RTA (RMS) Guide to Traffic Generating Developments*, with the amount of traffic generated depending on the land use. *RMS Technical Direction TDT 2013/04a* notes that the generation rate for residential dwellings in regional areas is:

- Weekday average morning peak hour vehicle trips = 0.71 per dwelling;
- Weekday daily vehicle trips = 7.4 per dwelling; and
- Weekday average evening peak hour vehicle trips = 0.78 per dwelling.

The turning movement surveys detailed in Section 2.4.1 showed that the two-way traffic volume on Tallowood Crescent generated by the existing 17 lots is 0.65 veh/h/dwelling in the AM peak and 0.82 veh/h/dwelling in the PM peak, indicating the existing traffic generation is similar to that predicted by the rates in the RMS Guide

The total additional traffic generated by the proposed development is summarised in Table 4-1 below.

Table 4-1: Total Traffic Generation – Proposed Development

Time Period	Trip Rate	Measure	Total Traffic Generated
AM Peak	0.71 trips per dwelling	+110 dwellings	+78 trips per hour
PM Peak	0.78 trips per dwelling	+110 dwellings	+86 trips per hour
Daily	7.4 trips per dwelling	+110 dwellings	+814 trips per day

Other assumptions used to determine traffic generation and distribution for the site are that:

- 2/3 of traffic will be outbound, and 1/3 inbound in the AM Peak, with these values reversed in the PM Peak (in line with observations of existing movements and similar residential developments);
- 60% of traffic will utilise the new eastern intersection to access Gregadoo Road, while 40% will utilise Tallowood Crescent (in line with the distribution of lots between the two); and
- 60% of traffic will travel to/from the west, and 40% will travel to/from the east (in line with observations of existing movements).

The anticipated traffic volumes generated by the proposed development in the AM and PM peak periods are summarised in Figure 4-1 and Figure 4-2, below.

AM Peak 0815-0915											
Development Traffic Volumes											
New Intersection				Lakehaven Drive				Tallowood Crescent			
Gregadoo Rd (W)				Gregadoo Rd (W)				Gregadoo Rd (W)			
6 >				0 ^				13 >			
9 v				19 >				6 v			

PM Peak 1630-1730											
2030 Traffic Volumes + Development Traffic Volumes											
New Intersection				Lakehaven Drive				Tallowood Crescent			

Table 4-3: Intersection performance summary – with proposed development

Intersection	Total Flow (veh/h)	Degree of Saturation	Average Delay (sec)	Level of Service*
Gregadoo Rd & Tallowood Cr				
AM	545	0.139	0.6	A
PM	351	0.098	0.9	A
Gregadoo Rd & New Rd				
AM	596	0.154	0.6	A
PM	406	0.100	0.8	A

The analysis demonstrates that both intersections servicing the proposed development will operate at an excellent Level of Service (LOS A, the highest level) in both the AM and PM peak periods to 2030 following the proposed development. This indicates intersections that will continue to operate with low levels of delay and saturation, and with spare capacity.

As vehicles travel further throughout the network, traffic generated by the proposed development becomes more dispersed, and hence has a lower net impact on other intersections. Hence if the impact at nearby key intersections is within acceptable limits, then beyond these the impact will be even lower.

It is concluded that traffic from the proposed development can be accommodated at key intersections in the vicinity of the site, and that there will be no significant impacts on the performance of intersections as a result of the proposed development.

4.1.3 Traffic Impact Midblock

The additional traffic generated by the proposed development was added to the anticipated traffic volumes in 2030 on key streets. The total traffic volume following the proposed development is summarised in Table 4-4, below.

Table 4-4: 2030 Midblock traffic data – with proposed development

Location	Weekday	Weekday AM Peak		Weekday PM Peak	
	Veh/d	Veh/h	LOS	Veh/h	LOS
Gregadoo Road (Tallowood to Lakehaven)	3,388	500		313	
Eastbound		255	B	145	A
Westbound		245	B	168	A
Tallowood Crescent (South of Gregadoo)	404	46		51	
Northbound		29	A	15	A
Southbound		17	A	36	A
New Road (South of Gregadoo)	408	46		52	
Northbound		31	A	17	A
Southbound		15	A	35	A

The analysis demonstrates that all midblock sections of key roads will operate at a good Level of Service (LOS B) or better in both the 2030 AM and PM peak periods, even with the additional traffic generated by the proposed development.

New roads within the subdivision are proposed to be designed and constructed in accordance with the requirements of the City of Wagga Wagga's *Engineering Guidelines for Subdivisions*

and Developments. As the subdivision contains large lots, it is proposed that these be of a Rural Residential nature. Table 3.1.1 of Council's guidelines specifies that Rural Residential roads carrying 500 vehicles per day or less should have a 7.0m seal (6.0m carriageway plus 1.0m shoulder), and be set within a road reserve of 23m width. Plans for the proposed development show that this is achievable for all new roads.

Similar to impacts at intersections, as vehicles travel further throughout the network, traffic generated by the proposed development becomes more dispersed, and hence has a lower net impact on other roads. Hence if the impact on the roads surrounding the site is within acceptable limits, then beyond these roads the impact will be even lower.

It is concluded that there will be no significant impact on the midblock performance of roads within or surrounding the site, or further afield, as a result of the proposed development.

4.2 Parking Requirements and Impact

The *Wagga Wagga Development Control Plan 2010* specifies the minimum parking spaces required for a development, depending on the land use type. Given that the development will be a residential housing estate, and all houses will be provided with off-street parking to meet Council's requirements, it is not anticipated that there will be any significant impact to parking in the estate or surrounding areas as a result of the proposed development.

4.3 Public Transport

The extension of Tallowood Crescent and construction of new access and internal roads will allow for public transport to access the subdivision via an internal "loop". As development occurs, public transport and school bus service providers will be able to consider adjustments to existing routes to cater for the expected increase in demand for service that will accompany an increase in population.

It is concluded that public transport and school bus needs can be adequately met within the proposed development.

4.4 Pedestrian and Cyclist Impact

The suburb will be of a rural residential nature, with relatively low traffic volumes on internal roads. Dedicated pedestrian and cyclist facilities such as footpaths or shared paths are not required for this type of development under the City of Wagga Wagga's *Engineering Guidelines for Subdivisions and Developments*. Pedestrian and cyclist numbers are expected to be relatively low, and able to utilise either on-road or road verge areas.

There are no changes proposed to existing pedestrian and cyclist facilities in the vicinity of the proposed development.

It is concluded that the development is able to comply with Council's requirements, and have no significant adverse impact on pedestrians or cyclists.

5 CONCLUSIONS AND RECOMMENDATIONS

It is concluded that:

- Traffic surveys and modelling of the existing intersection of Gregadoo Road and Tallowood Crescent show that the intersection currently operates at an excellent Level of Service (LOS A, the highest level), with midblock level of service on Gregadoo Road and Tallowood Crescent Wagga Road south of the site also being excellent (LOS A);
- The proposed development involves increasing the number of lots from 31 to 141 (an increase of 110 lots), as well as construction of an internal road network and new intersection with Gregadoo Road;
- The proposed development will result in an increase in traffic volume of 814 vehicles per day (78 in the AM peak period and 86 in the PM peak period);
- There is sufficient capacity in the surrounding road network and key intersections to accommodate the additional traffic generated by the proposed development, in addition to catering for the next ten years growth in existing traffic volumes on the surrounding road network. Modelling shows that intersections and midblock levels of service will operate at either an excellent or good level of service (LOS A or B);
- Parking requirements can be met by providing off-street parking in accordance with the Wagga Wagga Development Control Plan 2010;
- Adequate provision has been made for public transport and school buses; and
- There will be no significant adverse impact on the movement of pedestrians and cyclists.

It is recommended that:

- The intersection of Gregadoo Road and Tallowood Crescent be upgraded to incorporate auxiliary turning lanes, including a Short Channelised Right Turn (CHR(S)) and Basic Left Turn (BAL); and
- The intersection of Gregadoo Road and the new western access road into the subdivision be designed and constructed to incorporate auxiliary turning lanes, including a Short Channelised Right Turn (CHR(S)) and Basic Left Turn (BAL).

APPENDIX A – INTERSECTION ANALYSIS – EXISTING

LANE SUMMARY

▽ Site: [Gregadoo & Tallowood_AM_Existing]

Intersection of Gregadoo Road and Tallowood Crescent, Lake Albert
AM Peak Period
Existing Traffic Volumes
Site Category: (None)
Giveaway / Yield (Two-Way)

Lane Use and Performance													
	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total	HV						Veh	Dist				
	veh/h	%											
South: Tallowood Cr (S)													
Lane 1	6	7.0	1210	0.005	100	5.4	LOS A	0.0	0.1	Full	500	0.0	0.0
Approach	6	7.0		0.005		5.4	LOS A	0.0	0.1				
East: Gregadoo Rd (E)													
Lane 1	193	7.0	1864	0.103	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	193	7.0		0.103		0.1	NA	0.0	0.0				
West: Gregadoo Rd (W)													
Lane 1	204	7.0	1855	0.110	100	0.1	LOS A	0.0	0.2	Full	500	0.0	0.0
Approach	204	7.0		0.110		0.1	NA	0.0	0.2				
Intersection	403	7.0		0.110		0.2	NA	0.0	0.2				

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

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

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 lanes.

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

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

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

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LANE SUMMARY

▽ Site: [Gregadoo & Tallowood_PM_Existing]

Intersection of Gregadoo Road and Tallowood Crescent, Lake Albert
PM Peak Period
Existing Traffic Volumes
Site Category: (None)
Giveaway / Yield (Two-Way)

Lane Use and Performance													
	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Tallowood Cr (S)													
Lane 1	3	7.0	1241	0.003	100	5.2	LOS A	0.0	0.1	Full	500	0.0	0.0
Approach	3	7.0		0.003		5.2	LOS A	0.0	0.1				
East: Gregadoo Rd (E)													
Lane 1	129	7.0	1862	0.070	100	0.2	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	129	7.0		0.070		0.2	NA	0.0	0.0				
West: Gregadoo Rd (W)													
Lane 1	107	7.0	1832	0.059	100	0.4	LOS A	0.1	0.4	Full	500	0.0	0.0
Approach	107	7.0		0.059		0.4	NA	0.1	0.4				
Intersection	240	7.0		0.070		0.4	NA	0.1	0.4				

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

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

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 lanes.

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

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

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

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APPENDIX B – INTERSECTION ANALYSIS – WITH DEVELOPMENT

LANE SUMMARY

▽ Site: [Gregadoo & Tallowood_AM_2030 With Development]

Intersection of Gregadoo Road and Tallowood Crescent, Lake Albert

AM Peak Period

2030 Traffic Volumes - With Proposed Development

Site Category: (None)

Giveaway / Yield (Two-Way)

Lane Use and Performance													
	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Tallowood Cr (S)													
Lane 1	31	7.0	913	0.033	100	6.5	LOS A	0.1	0.9	Full	500	0.0	0.0
Approach	31	7.0		0.033		6.5	LOS A	0.1	0.9				
East: Gregadoo Rd (E)													
Lane 1	246	7.0	1862	0.132	100	0.2	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	246	7.0		0.132		0.2	NA	0.0	0.0				
West: Gregadoo Rd (W)													
Lane 1	258	7.0	1854	0.139	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	11	7.0	1365	0.008	100	6.3	LOS A	0.0	0.2	Short	40	0.0	NA
Approach	268	7.0		0.139		0.3	NA	0.0	0.2				
Intersection	545	7.0		0.139		0.6	NA	0.1	0.9				

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

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

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LANE SUMMARY

▽ Site: [Gregadoo & New Access_AM_2030 With Development]

Intersection of Gregadoo Road and New Subdivision Access Road, Lake Albert

AM Peak Period

2030 Traffic Volumes - With Proposed Development

Site Category: (None)

Giveaway / Yield (Two-Way)

Lane Use and Performance													
	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: New Rd (S)													
Lane 1	34	7.0	819	0.041	100	7.0	LOS A	0.2	1.1	Full	500	0.0	0.0
Approach	34	7.0		0.041		7.0	LOS A	0.2	1.1				
East: Gregadoo Rd (E)													
Lane 1	287	7.0	1863	0.154	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	287	7.0		0.154		0.1	NA	0.0	0.0				
West: Gregadoo Rd (W)													
Lane 1	265	7.0	1853	0.143	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	9	7.0	1304	0.007	100	6.5	LOS A	0.0	0.2	Short	40	0.0	NA
Approach	275	7.0		0.143		0.2	NA	0.0	0.2				
Intersection	596	7.0		0.154		0.6	NA	0.2	1.1				

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

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

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LANE SUMMARY

▽ Site: [Gregadoo & Tallowood_PM_2030 With Development]

Intersection of Gregadoo Road and Tallowood Crescent, Lake Albert

PM Peak Period

2030 Traffic Volumes - With Proposed Development

Site Category: (None)

Giveaway / Yield (Two-Way)

Lane Use and Performance													
	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: Tallowood Cr (S)													
Lane 1	16	7.0	1043	0.015	100	5.8	LOS A	0.1	0.4	Full	500	0.0	0.0
Approach	16	7.0		0.015		5.8	LOS A	0.1	0.4				
East: Gregadoo Rd (E)													
Lane 1	182	7.0	1857	0.098	100	0.5	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	182	7.0		0.098		0.5	NA	0.0	0.0				
West: Gregadoo Rd (W)													
Lane 1	129	7.0	1850	0.070	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	23	7.0	1461	0.016	100	6.1	LOS A	0.1	0.5	Short	40	0.0	NA
Approach	153	7.0		0.070		0.9	NA	0.1	0.5				
Intersection	351	7.0		0.098		0.9	NA	0.1	0.5				

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

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

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LANE SUMMARY

▽ Site: [Gregadoo & New Access_PM_2030 With Development]

Intersection of Gregadoo Road and New Subdivision Access Road, Lake Albert

PM Peak Period

2030 Traffic Volumes - With Proposed Development

Site Category: (None)

Giveaway / Yield (Two-Way)

Lane Use and Performance													
	Demand Flows		Cap.	Deg. Satn	Lane Util.	Average Delay	Level of Service	95% Back of Queue		Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	Total veh/h	HV %	veh/h	v/c	%	sec		Veh	Dist m		m	%	%
South: New Rd (S)													
Lane 1	18	7.0	994	0.018	100	6.0	LOS A	0.1	0.5	Full	500	0.0	0.0
Approach	18	7.0		0.018		6.0	LOS A	0.1	0.5				
East: Gregadoo Rd (E)													
Lane 1	186	7.0	1857	0.100	100	0.5	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	186	7.0		0.100		0.5	NA	0.0	0.0				
West: Gregadoo Rd (W)													
Lane 1	180	7.0	1854	0.097	100	0.0	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	22	7.0	1454	0.015	100	6.1	LOS A	0.1	0.5	Short	40	0.0	NA
Approach	202	7.0		0.097		0.7	NA	0.1	0.5				
Intersection	406	7.0		0.100		0.8	NA	0.1	0.5				

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

Lane LOS values are based on average delay per lane.

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

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 lanes.

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

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

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

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