Traffic Engineering

Cemetery Road, Corowa

Proposed Subdivision of Land

Traffic Impact Assessment

Contents

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1 Introduction and Scope

TTM Consulting (Vic) Pty Ltd has been engaged by the Applicant to prepare a Traffic Impact Assessment (TIAR) to accompany a Development Application for a proposed subdivision of the land located on Cemetery Road, Corowa.

The following report undertakes the following:

- Reviews the existing traffic conditions proximate to the subject site.
- Determines the additional traffic that will be generated by the proposal and assesses its impact on the existing conditions proximate to the subject site, including the provision for any intersection and/or road upgrades.
- Reviews the internal subdivision layout plans, confirming whether traffic related conditions are appropriate.

Following a meeting between the Applicant and Federation Council Officers on the 3rd June 2021, updates have been incorporated into the report following the supply of additional background material.

Record

No.	Author	Reviewed/Approved	Description	Date
1.	J. Bradley	D. Hancox	Proposed Subdivision	29/01/2020
2.	J. Bradley	D. Hancox	Amended Development Plans	14/07/2020
3.	J. Bradley	D. Hancox	Amendment: Vehicle Distribution	05/08/2021

2 Existing Conditions

2.1 The Site

The site is located on the eastern side of Cemetery Road, Corowa as shown in Figure 2.1 and has a total area of approximately 27.77 hectares. The site is split into two parcels, with the northern parcel (169-199 Redlands Road) bounded by Redlands Road on the north and Tower Street on the south, whilst the southern parcel (42-80 Cemetery Road) is located to the south of Baber Street.

Figure 2.1: Site Location

As shown in Figure 2.2, the site is zoned for Low Density Residential (R2) within the Corowa Local Environmental Plan (LEP) 2012 and is surrounded by residential, industrial and rural agricultural uses. The site is currently vacant and used for agricultural purposes.

Figure 2.2: Site Zoning

The site comprises of the following Lot / Section / Plan Numbers Lot 1 / DP199174, Lot 2 / DP199174, 66 /-/ DP1167493.

2.2 Road Network

The existing road network proximate to the subject site can be seen in Figure 2.3.

Figure 2.3: Road Network

Redlands Road is a Regional Road, therefore managed by Council and part funded by the State. The road contains a single sealed carriageway, approximately 9 metres in width along the frontage of the site. The road is a designated B-double route, as shown in Figure 2.5, and has a posted speed limit of 80 km/h.

Figure 2.4 below, outlines the configuration of Redlands Road along the frontage of the site.

Figure 2.4: Redlands Road Configuration (Facing West)

Figure 2.5: NSW Combined Higher Mass Limits (HML) and Restricted Access Vehicle (RAV) Map

Cemetery Road is a Local Road, therefore managed by Council. The road contains a single sealed carriageway, approximately 6 metres in width along the frontages of the site. There is no posted speed limit along Cemetery Road, therefore the default speed limit, based on the NSW Speed Zoning Guidelines (2011), of 100km/h applies.

Figure 2.6 below, outlines the configuration of Cemetery Road proximate to the site.


Figure 2.6: Cemetery Road Configuration (Facing North)

Tower Street, **Chisnall Street** and **Barber Street** are Local Roads, therefore managed by Council. These streets contain single sealed carriageways that are approximately 8.0 metres wide. Barber Street currently has no connections at either end of the street, with a temporary, unsealed turning area provided at the eastern end. There are no posted speed limit along any of the street, therefore the default speed limit, based on the NSW Speed Zoning Guidelines, of 50km/h applies (Classified as Urban)

Figure 2.7, Figure 2.8 and Figure 2.9 show the configuration of Tower Street, Chisnall Street and Barber Street, respectively, proximate to the site.

Figure 2.7: Tower Street Configuration (Facing West)

Figure 2.8: Chisnall Street Configuration (Facing South)

Figure 2.9: Barber Street Configuration (Facing West)

2.3 Public Transport

There are no public transport services operating within close proximity of the subject site, however school buses were observed using both Cemetery Road and Redlands Road.

2.4 Pedestrian Facilities

There are no existing pedestrian facilities along the subject site's frontages with Redlands Road, Cemetery Road, Tower Street or Barber Street, however a footpath is provided to the southern side on Tower Street and the eastern side of Chisnall Street.

2.5 Bicycle Facilities

There are no existing on-road bicycle lanes on Redlands Road, Cemetery Road, Tower Street or Barber Street, nor are there any off road bicycle paths in the proximate area.

3 The Proposal

The subdivision plans can be seen in Figure 3.1 below, with a full scale copy attached in Appendix A, which indicates a proposed 36 lot subdivision.

The subdivision comprises of residential lots, ranging from 551 to 672 square metres in size.

The site located north of Tower Street (Site 1) contains 137 lots, whilst the site to the south (Site 2) contains 169 lots.

Access to each of the lots is proposed via the internal road network, with three connections to Cemetery Road, three connections with Tower Street, one connection with Chisnall Street and one connection with Redlands Road. The internal road network will also incorporate connections to Barber Street.

Figure 3.1: Subdivision Plans

4 Traffic Generation and Impacts

4.1 Existing Traffic Volumes

TTM Consulting has undertaken traffic counts at both the intersection of Redlands Road with Cemetery Road, and the intersection of Tower Street with Chisnall Street on Wednesday 11th December 2019, between the hours of 7:30am and 10:30am. These counts have been summarised in Table 4.1 and Figure 4.1 below.

Table 4.1: Existing Traffic Volumes

Time	Cemetery Road (Southbound)			Redlands Road (Westbound)			Cemetery Road (Northbound)			Redlands Road (Eastbound)			Total
	L	T	R	L	T	R	L	T	R	L	T	R	
7:00am-8:00am	9	4	6	3	119	21	28	9	0	9	43	15	266
Time				Tower Street (Westbound)			Chisnall Street (Northbound)			Tower Street (Eastbound)			Total
				L	T	R	L	T	R	L	T	R	
8:15am-9:15am	-	-	-	12	18	0	1	0	25	0	13	0	69

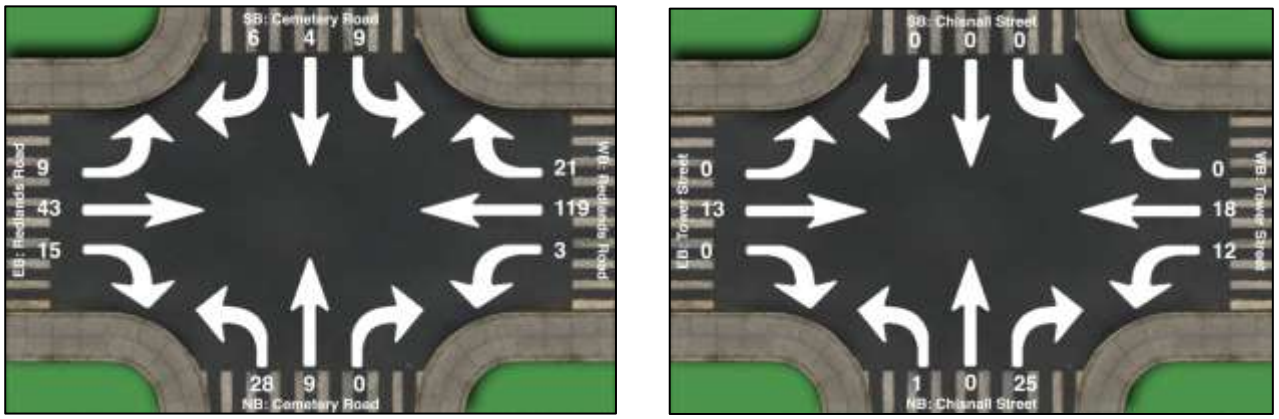


Figure 4.1: Traffic Count Summaries

Taking into account that the data gained during the peak hour typically represents approximately 8-12% of the daily traffic volumes, it can be assumed that proximate to the site, these roads currently have the following two-way average daily traffic (ADT) volumes listed in Table 4.2.

Table 4.2: Daily Traffic Movements

Road	Road Type	Daily Traffic Volume
Redlands Road	Regional Road	1,950 vpd
Cemetery Road	Local Road	590 vpd
Tower Street	Local Road	690 vpd
Chisnall Street	Local Road	380 vpd

4.2 Estimated Traffic Generation

The RMS' *Guide to Traffic Generating Development's* (Issue 2.2, October 2002) provides advice on the potential traffic generation of various land uses. The following rates listed in Table 4.3 below, apply to the site and were obtained from updated traffic surveys in TDT 2013/04a.

Table 4.3: Anticipated Traffic Generation

Use	Area	Type	Rate	Inventory	Vehicle Trips	Site 1	Site 2
Low Density Residential Dwellings	Regional	Daily	7.4 per dwelling	306 no.	2,265 no.	1,014 no.	1,215 no.
		Weekday PM Peak Hour	0.90 per dwelling		276 no.	123 no.	153 no.
		Weekday AM Peak Hour	0.85 per dwelling		261 no.	116 no.	145 no.

The proposal is anticipated to generate a total of 2,265 daily vehicle trips, with approximately 537 of these daily vehicle trips expected to occur during the peak AM and PM periods.

4.3 Distribution of Additional Traffic

Taking into account the location of the site in comparison to the township of Corowa and its amenities, and that the proposal is for single residential lots, it is assumed that a majority of traffic generated by the site (approximately 95%) will travel to and from the east either along Tower Street or Redlands Road into Corowa, with the remaining traffic travelling to and from the west along Redlands Road.

Figure 4.2 outlines the site location and the location of these amenities.

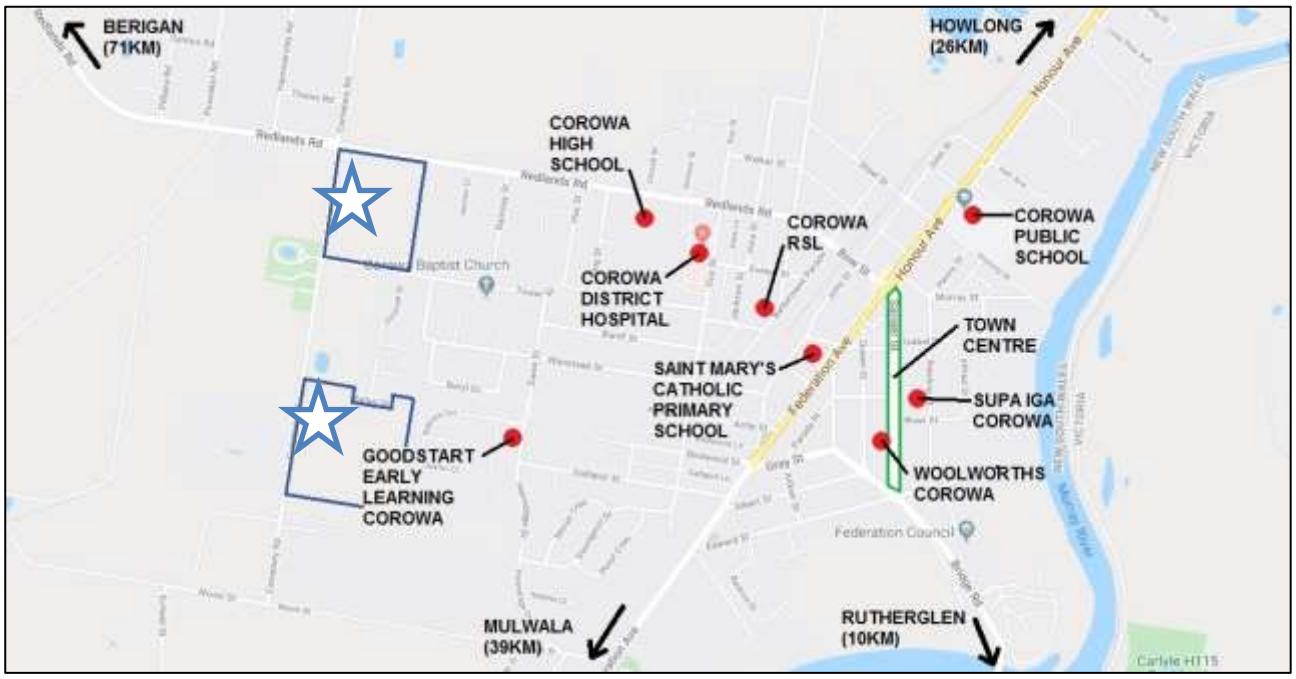


Figure 4.2: Proximate Amenities

The expected distribution of traffic for the two sites is shown in Figure 4.3 below. For Site 1, it is anticipated approximately 68 percent of traffic will likely utilise Redlands Road directly, with an additional 8 percent via Cemetery Road. The remaining 24 percent are expected to likely utilise Tower Street. For Site 2, it is anticipated that 80 percent of traffic will utilise Cemetery Road to access Redlands Road, whilst the remaining 20 percent will utilise Chisnall Street to access Tower Street.

Figure 4.3: Anticipated Distribution

Figure 4.4 outlines the anticipated additional AM turning movements generated by the proposal.

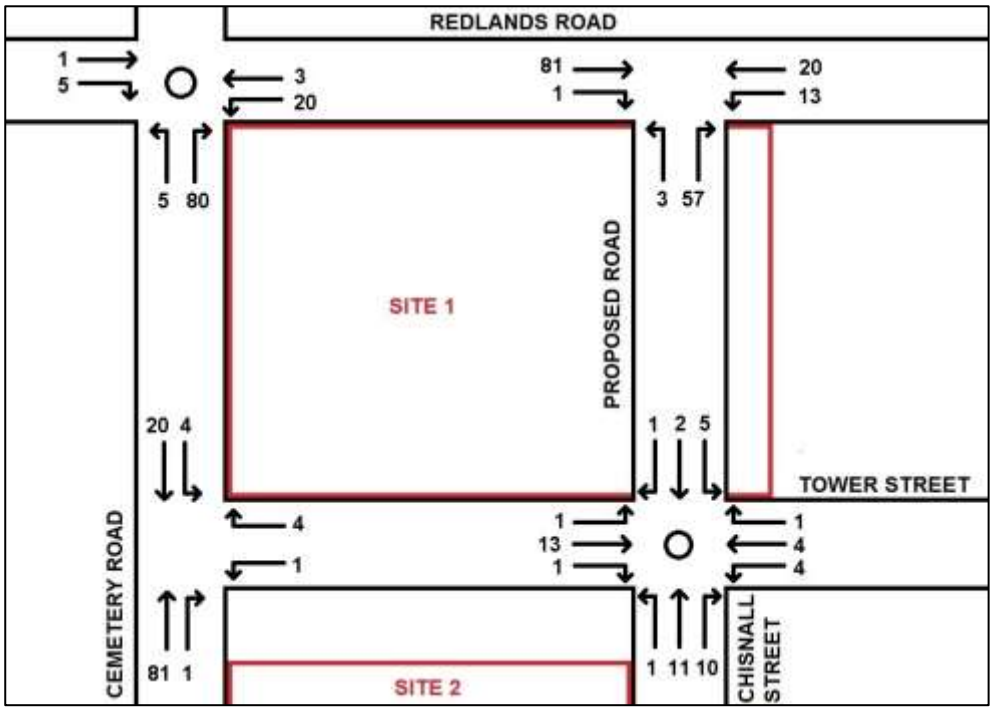


Figure 4.4: Additional AM Turning Movements

4.4 Impact of Additional Traffic on Existing Intersections

A SIDRA analysis has been performed on the exiting intersection of Redland Road and Cemetery Road (shown in Figure 4.5), and the exiting intersection of Tower Street and Chisnall Street (Figure 4.6).

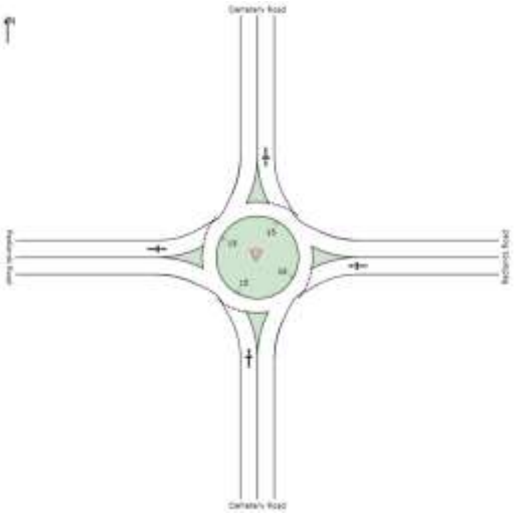
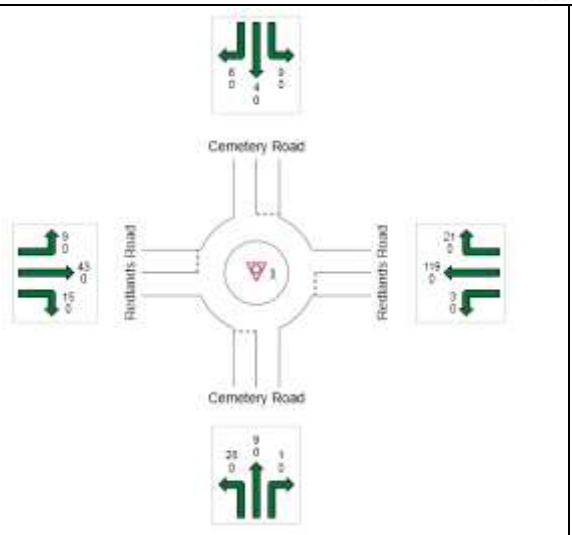
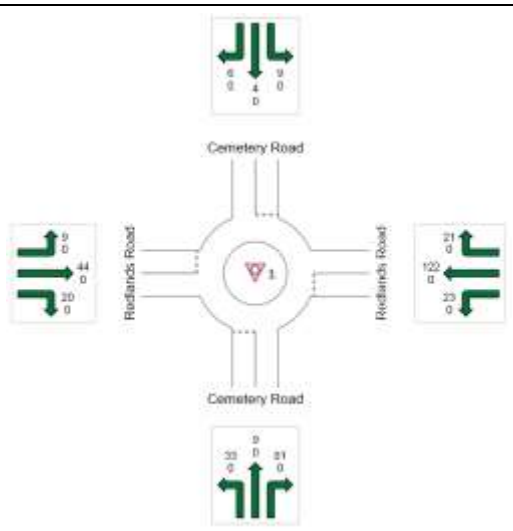
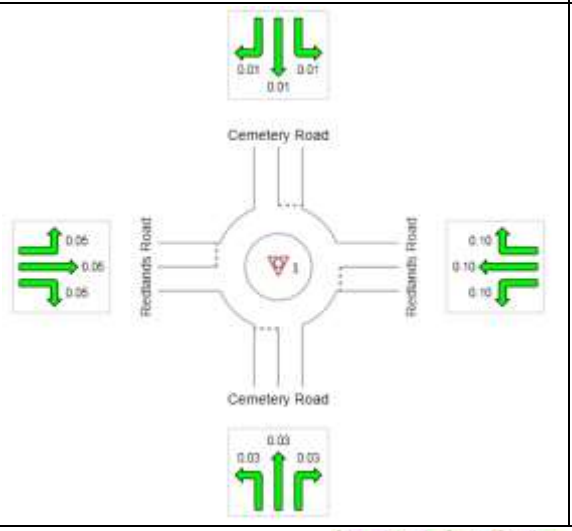
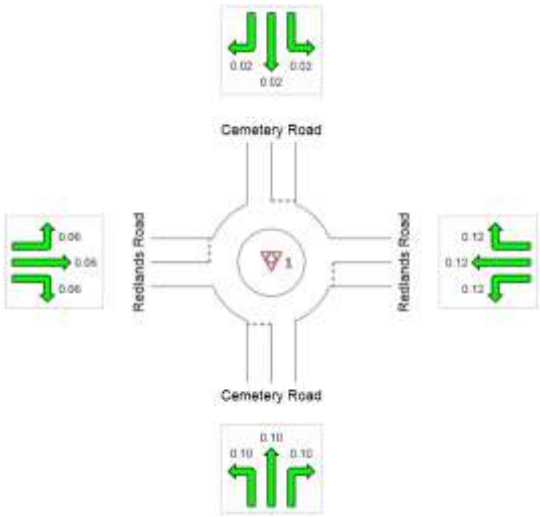
Figure 4.5: Intersection of Redlands Road/Cemetery Road

Figure 4.6: Intersection of Tower Street/Chisnall Street

The existing conditions and post development conditions can be seen in Table 4.4 and Table 4.5 below, along with the results of the analysis.

One of the key outputs from SIDRA is the Degree of Saturation (DOS). A DOS of 0.9 represents the level at which intersections may need additional works to ensure that it continues to operate with an appropriate level of service.

Table 4.4: SIDRA Analysis (Redlands Road / Cemetery Road)

Item	Existing	Post Development
Intersection of Redlands Road and Cemetery Road		
Layout		
Input Volume		
Degree of Saturation		
		

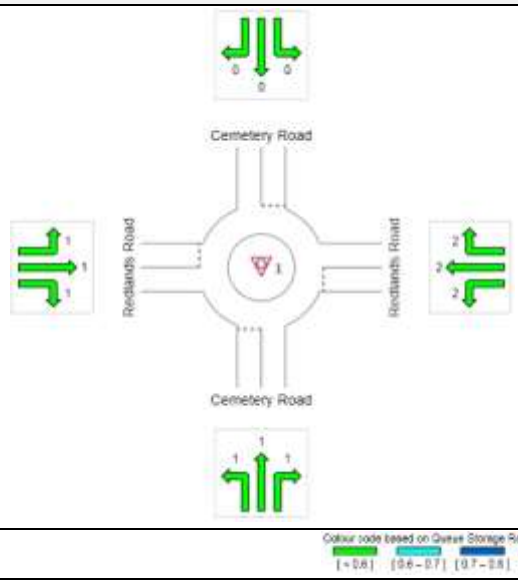
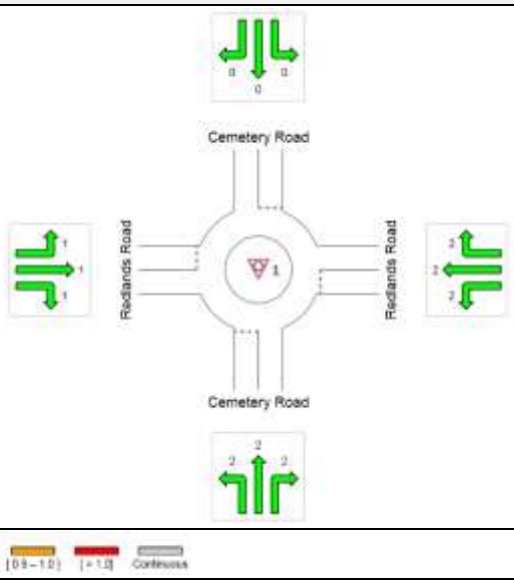
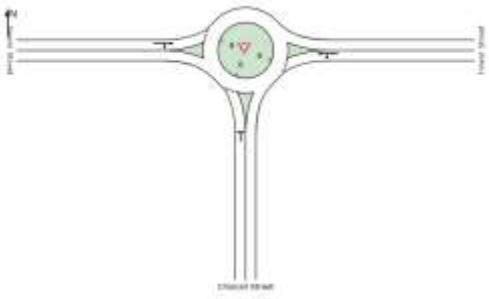
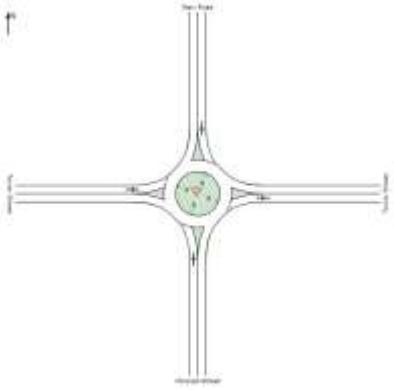
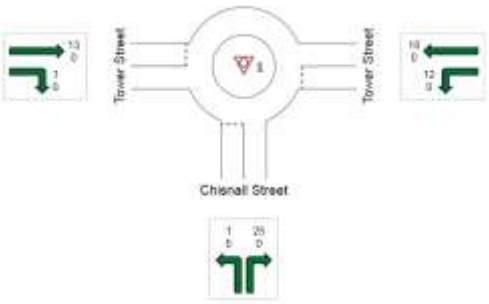
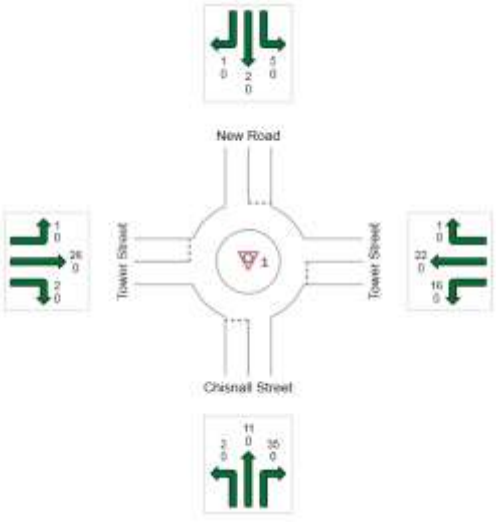
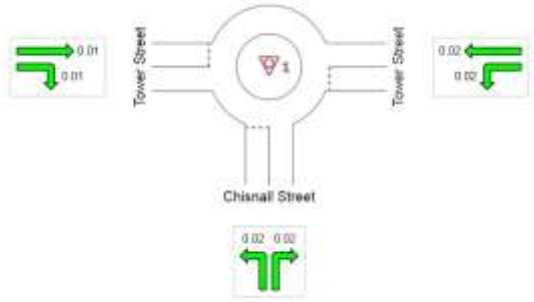
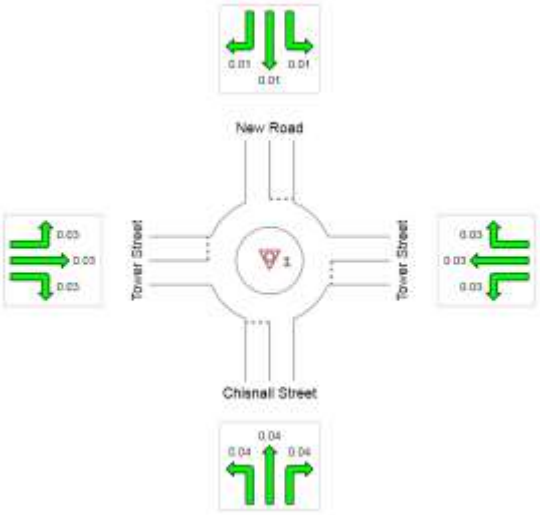
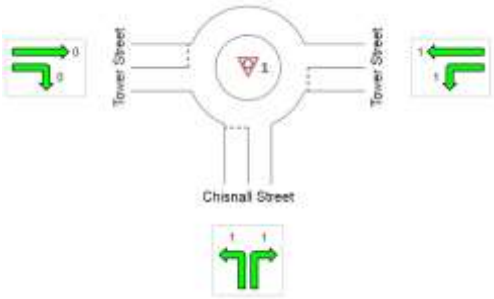
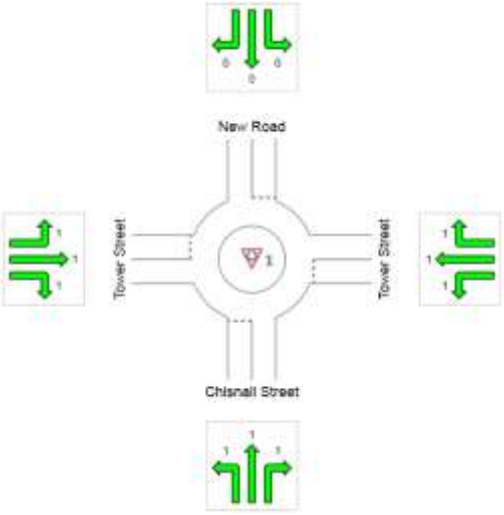
Item	Existing	Post Development
95th Percentile Queue Length		
		

Table 4.5: SIDRA Analysis (Tower Street / Chisnall Street)

Item	Existing	Post Development
Intersection of Tower Street and Chisnall Street		
Layout		
Input Volume		

Item	Existing	Post Development
Degree of Saturation		
		
95th Percentile Queue Length		
		

There is a small increase in the degree of saturations and 95th percentile queue lengths post development, however they are both well below capacity, therefore the proposal is anticipated to have minimal impact on the functionality of these existing intersections.

4.5 Provision for New Vehicle Access onto Redlands Road

The development has one proposed major connections with the external road network, as shown in Figure 4.7 below, which is anticipated to accommodate a large proportion of traffic entering and exiting subdivision.

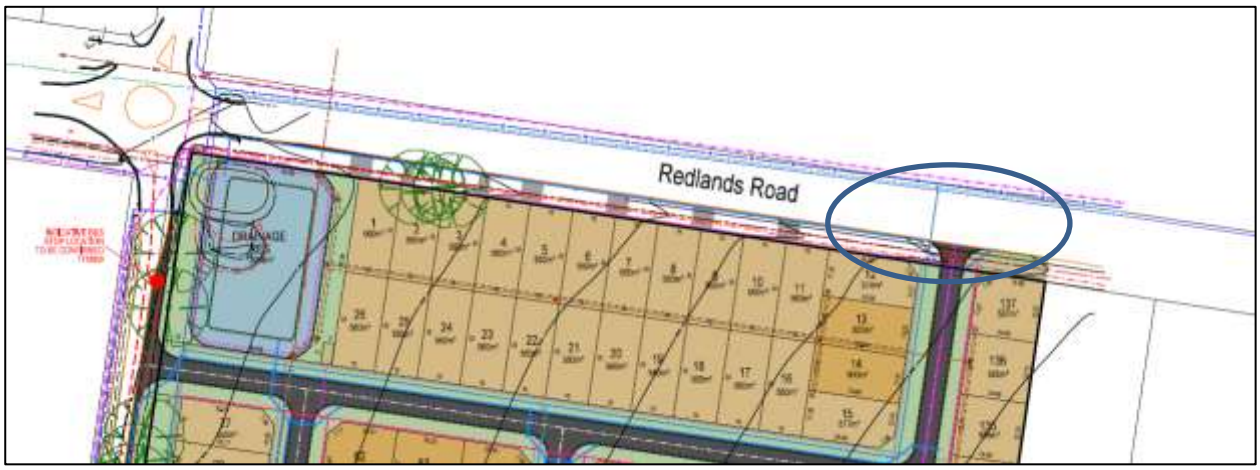


Figure 4.7: Major External Connection

The proposed T intersection of the internal road with Redlands Road along the north of the site, as mentioned in Section 4.3, is anticipated to accommodate 60 percent of the Site 1 traffic movements.

AustRoads *Guide to Road Design Part 4: Intersections and Crossings* (2017) outlines the warrants for turning treatments on major road at unsignalised intersections. Based on the assumptions from Section 4.3 (modified to PM), and the traffic surveys mentioned in Section 4.1, the following warrants apply to the intersection, as shown in Figure 4.8.

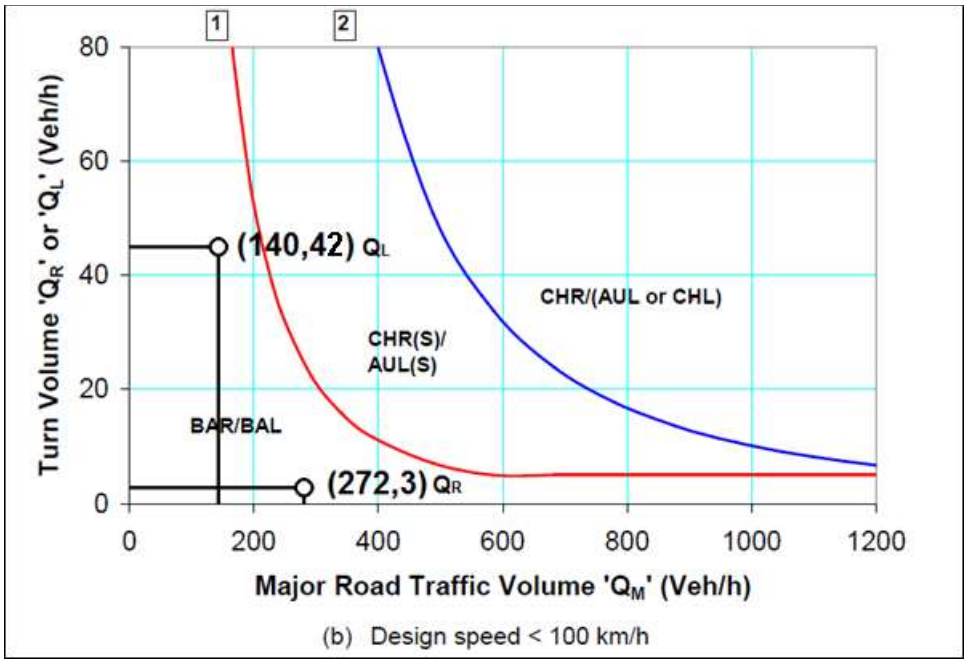


Figure 4.8: Turning Treatment Warrants (AustRoads GRD Part 4, 2017)

According to the AustRoads Turning Treatment Warrants, a Basic Left (BAL) and Basic Right (BAR) turn treatments are only required for this intersection.

The above is based on the existing carriageway configuration and speed limit of 80km/h for Redlands Road along the frontage of the site. The speed limit however changes to 60km/h just east of the site, as Redlands Road enters the urban areas of Corowa. Due to the urban nature of the proposal, and with 12 of the lots

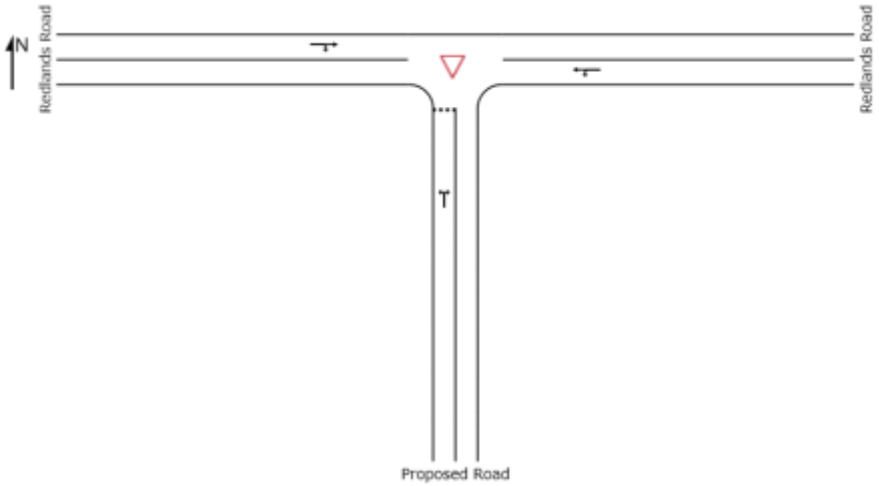
have direct access from Redlands Road, it is anticipated the 60km/h speed limit of Redlands Road will stretch westward to the intersection with Cemetery Road. However, as the speed limit would still be <100km/h, no changes to the turning warrants are applicable.

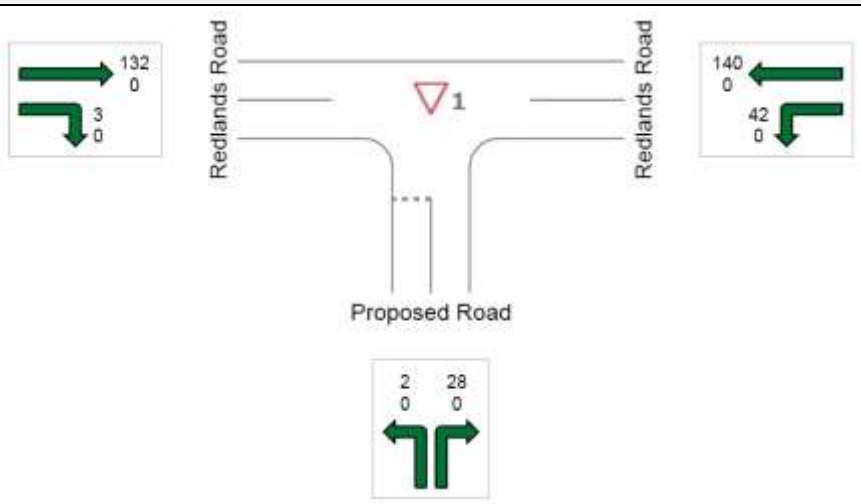
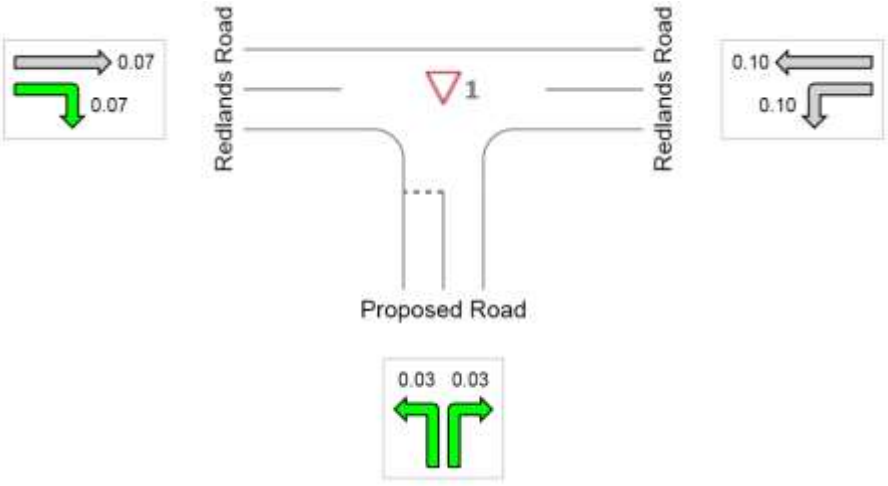
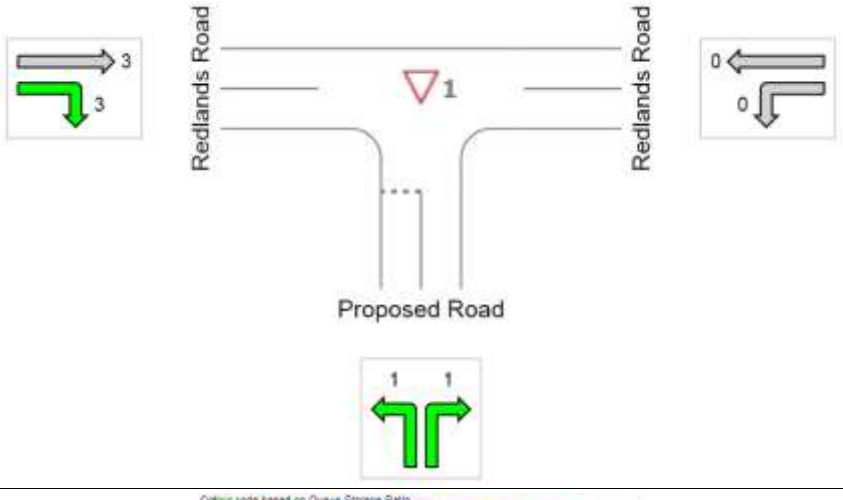
Upon inspection of Redlands Road to the east of the subject site, it is also noted that the carriageway configuration also changes to provide an additional parking lane on the outer side of the through lanes, which at intersections becomes an auxiliary left turn lane as shown in Figure 4.9 below. Given a basic left turn treatment is currently required for the new intersection, which could change to an auxiliary left turn treatment in the future (based upon 2% growth rate for 30 year) as stated in Section 4.6, the provision of a parking/turning lane along the frontage of the site is considered an appropriate treatment.

Figure 4.9: Redlands Road Configuration

A SIDRA analysis has been performed on the proposed intersection, with the results of the analysis shown in Table 4.6 below.

Table 4.6: SIDRA Analysis

Item	Result
Layout	

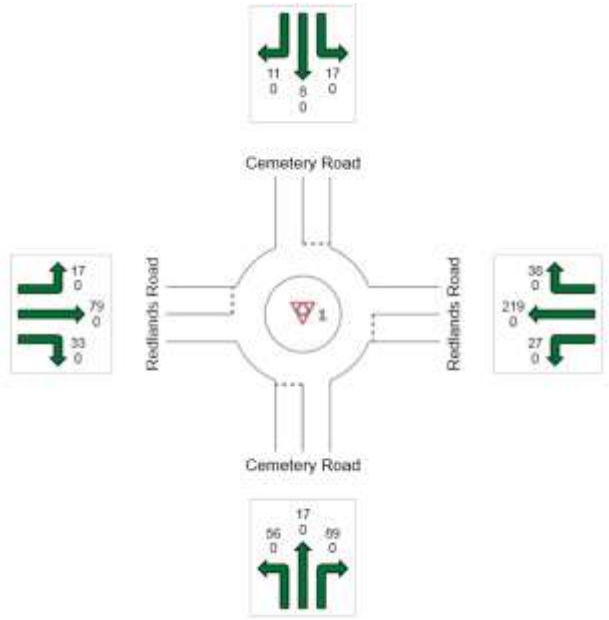
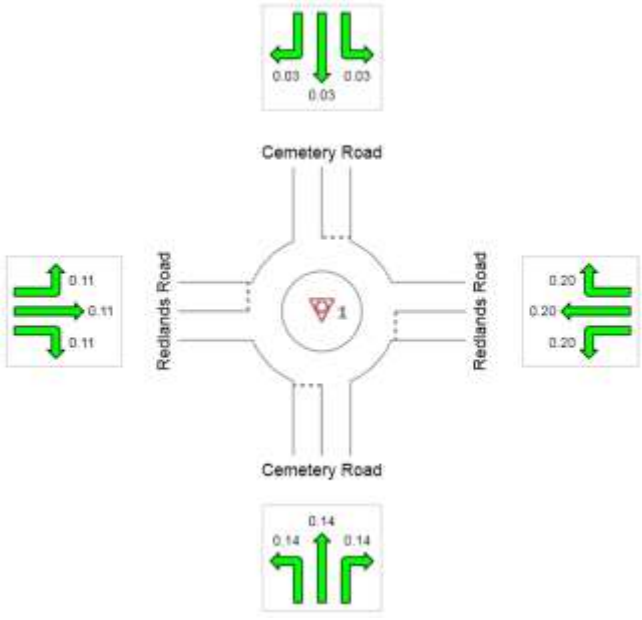
Item	Result
Input Volumes	
Degree of Saturation	 
95th Percentile Queue Length	 

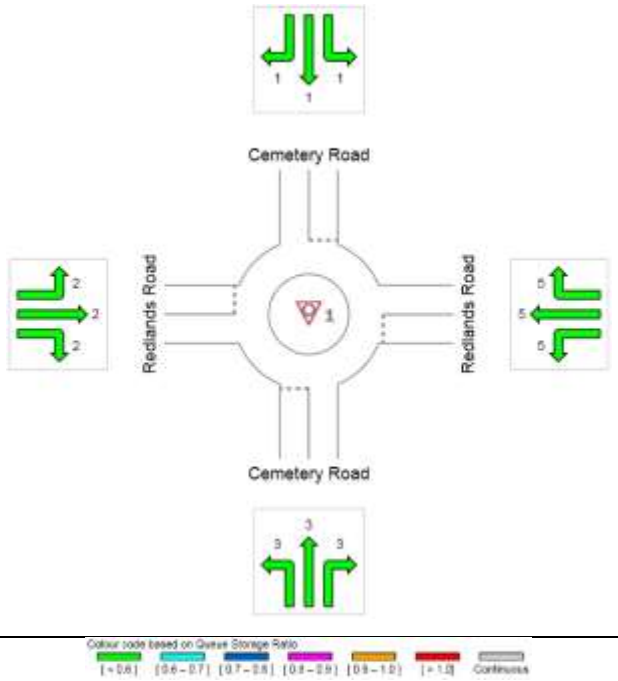
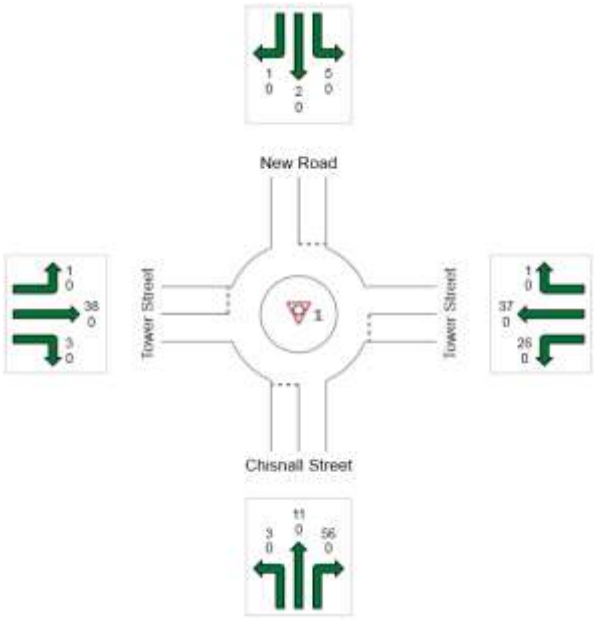
The degree of saturations and 95th percentile queue lengths are both well below capacity, therefore the proposal is anticipated to have minimal impact on the functionality of the proposed intersection.

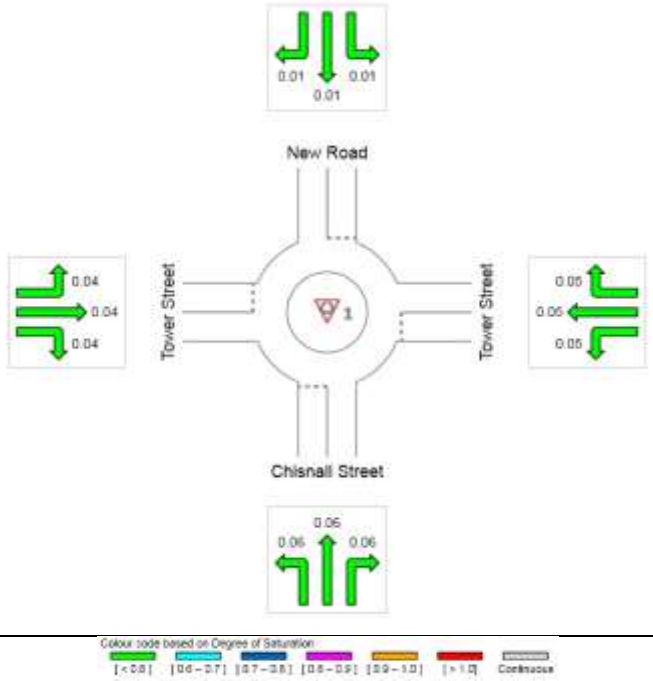
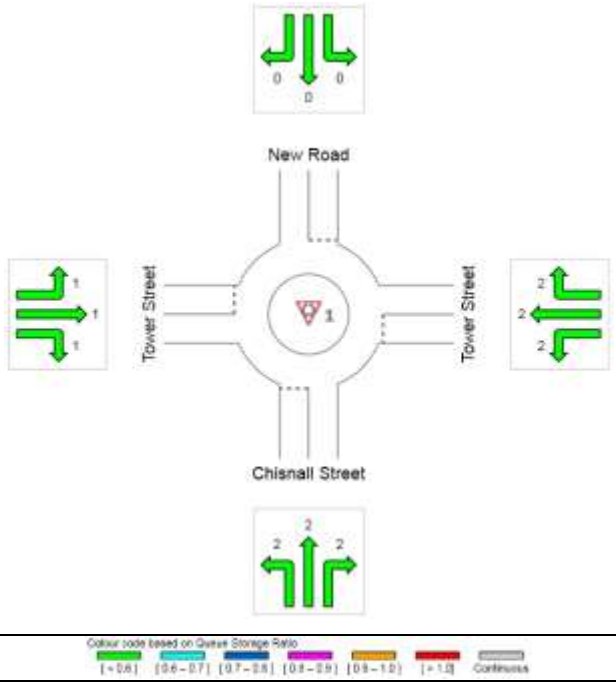
4.6 Future Traffic Growth

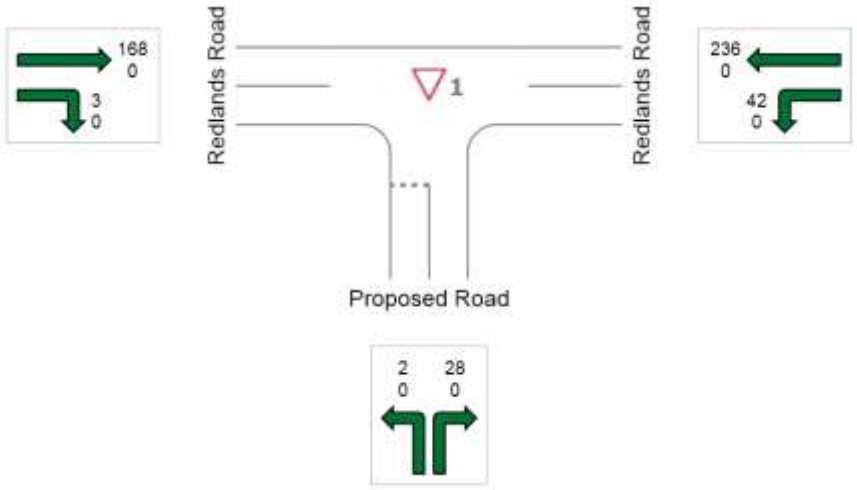
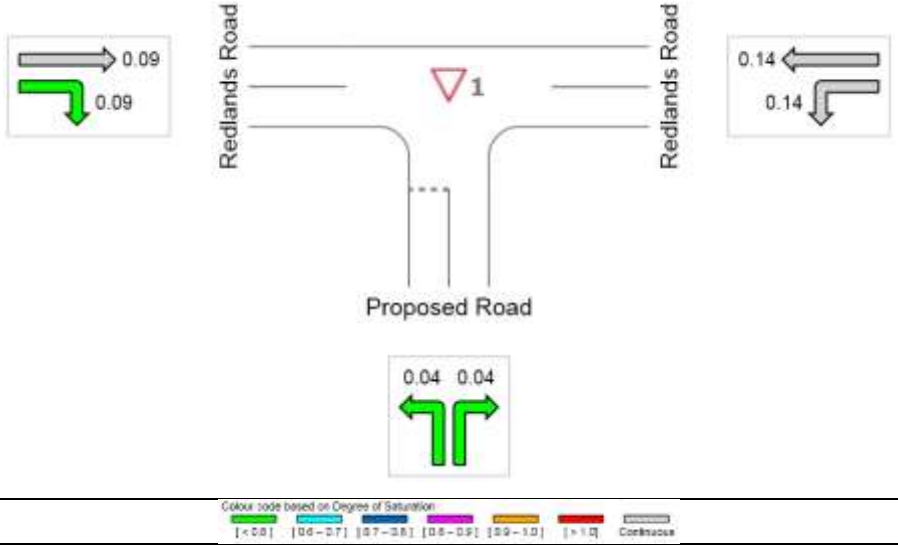
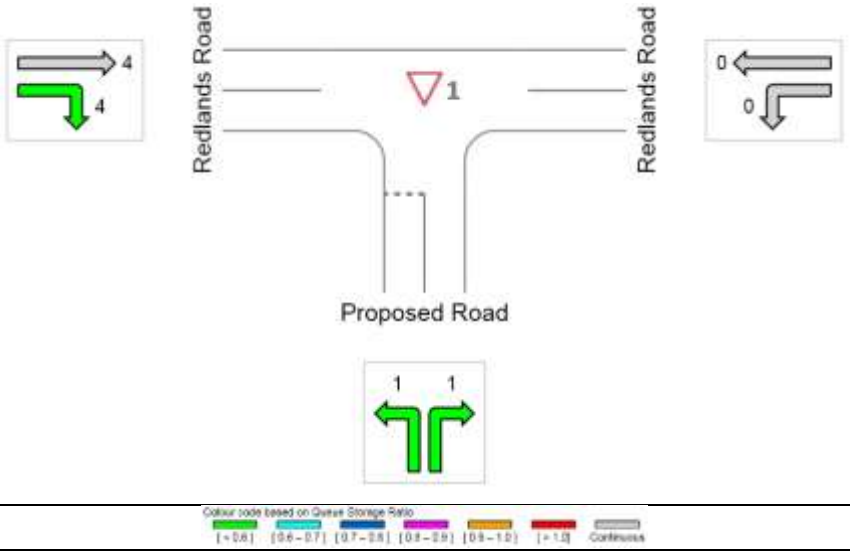
The above SIDRA analysis is based on the existing traffic volumes obtained in December 2019, as mentioned in Section 4.1. However, Federation Council have requested that an analysis be performed taking into account a 30 year growth in the overall neighbourhood. A growth factor of 2 percent was used to estimate future traffic volumes, with the results of the analysis outlined in Table 4.7 below.

Table 4.7: SIDRA Analysis (30 year future growth)

Item	30 Year Future Traffic Volume Growth
Intersection of Redlands Road and Cemetery Road	
Input Volumes	
Degree of Saturation	 

Item	30 Year Future Traffic Volume Growth
95th Percentile Queue Length	
Intersection of Tower Street and Chisnall Street	
Input Volumes	

Item	30 Year Future Traffic Volume Growth
Degree of Saturation	
95th Percentile Queue Length	

Intersection of Redlands Road and Proposed Access Road	
Input Volumes	
Degree of Saturation	
95th Percentile Queue Length	

The proposed T intersection of Redlands Road and the internal road along the north of the site was also re-assessed against the AustRoads *Guide to Road Design Part 4: Intersections and Crossings* (2017) warrants for turning treatments, based on the 30 year growth rate traffic volumes, and is shown in Figure 4.9 below.

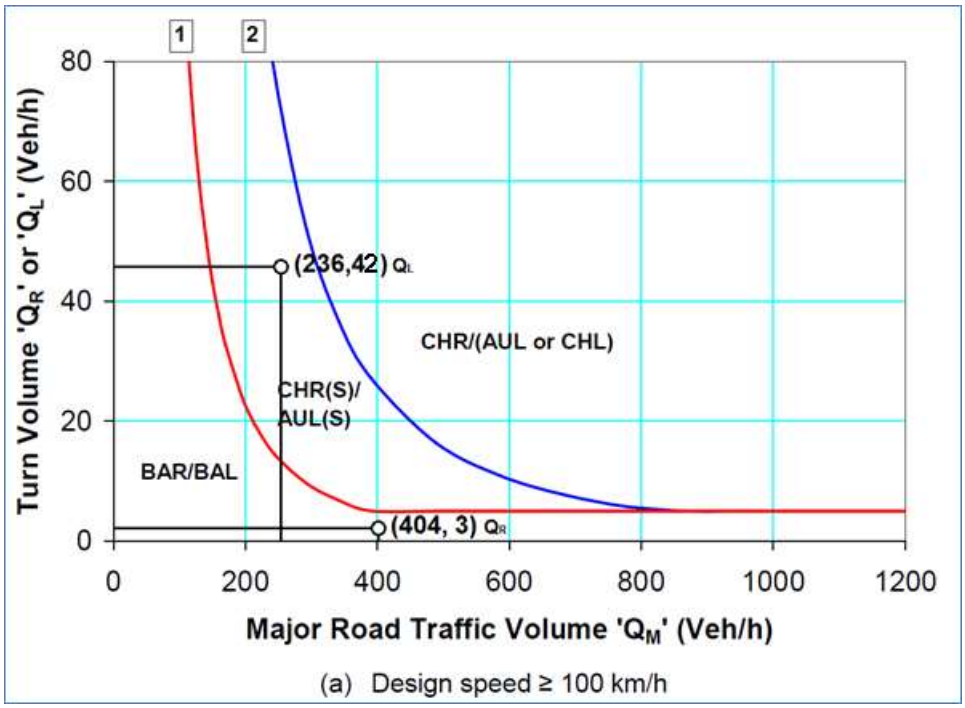


Figure 4.9: 30 Year Growth Turning Treatment Warrants (AustRoads GRD Part 4, 2017)

The warrants indicate that there could be a potential need for the current requirement of Basic Left (BAL) turn treatment to be upgraded to an Auxiliary Left (AUL) turn Treatment in the future. It is noted that the provision of a parking lane as proposed in the cross section for Redlands Road, provides the equivalent to an AUL treatment.

5 Proposed Road Network

5.1 External Road Network

5.1.1 Redlands Road

As mentioned in Section 4.5, to maintain consistency with the management of the road network, the existing speed limit of Redlands Road along the frontage of the site would be reduced from 80 km/h to 60 km/h.

The carriageway configuration of Redlands Road will need to be modified to include a parking/turning lane on the southern side of the carriageway along the frontage of the site, to match the existing configuration of Redlands Road to the east. These modifications to the existing road will provide greater safety for road users in the area, especially the 12 lots that front Redlands Road.

5.1.2 Cemetery Road

Given the increase in traffic movements along Cemetery Road as a result of the proposed development, the classification of the road will be changed from a rural road to a local distributor road. Table 1 of the Federation Council's 'Engineering Guidelines for Subdivisions and Development Standards, Part 2: Design of Roads' (Nov 2018) states the following requirements for a Local Distributor Road, as shown in Table 5.1 below.

Table 5.1: Characteristics of Roads in Residential Subdivision Road Networks (Local Distributor)

Classification of Road	Local Distributor
No. of Dwellings Served	500-750
Min. Carriageway Widths (m)	13
Min. Verge Width (m)	2 x 8.35
Min. Road Reserve (m)	30
Lane Provision	2 Moving + Parking
Maximum Desirable Speed (km/h)	40 – 60
Maximum Design Speed (km/h)	60
Footpath Requirement (m)	2.5m wide shared cycleway verge on one side + 1.5 on other
Kerb and Gutter	150mm high Integral barrier

The characteristics of the Local Distributor road include two travel lanes plus a parking lane on either side of the travel lanes. The design conditions along Cemetery Road propose the following:

- No direct vehicle access from individual lots, as all lots with frontages to Cemetery Road do so with back the back fence. Each of these lots has another street frontage to a local road which provides vehicle access and on-street parking for visitors.
- No change to the existing land uses on the western side of Cemetery Road which are outside of the subject site.

As no direct access to the residential lots is proposed along Cemetery Road (back fences only), the requirement of parking along the eastern side of the Cemetery Road carriageway, along the site's frontage, is not considered necessary, especially since on-street parking is provided within the internal road network along the frontages of the lots. Therefore the upgraded Cemetery Road carriageway will only require a width of 7.0 metres along the frontage of the site, which includes the provision for two 3.5 metre wide travel lanes. If development in the future was to occur on the western side of Cemetery Road, this development could provide the parking lane if the design is warranted.

If the provision of a bus stop(s) along Cemetery Road is needed, the carriageway will required the additional 3.0 metre width at the location of the stop only, and given there is no access to the proposed residential lots from Cemetery Road, any bus stop should be located as close to an intersection as possible.

However as the environment along the eastern side of the road will go from being rural to urban it is recommended that the speed limit of Cemetery Road be reduced to 60 km/h, from the current unposted default speed limit of 100 km/h. These recommended speed limit reductions are in line with the NSW Speed Zoning Guidelines (2011).

5.2 Internal Road Network

The proposal includes the provision of new internal roads within the subdivision to form the following internal road network, as shown in Figure 5.1 below.

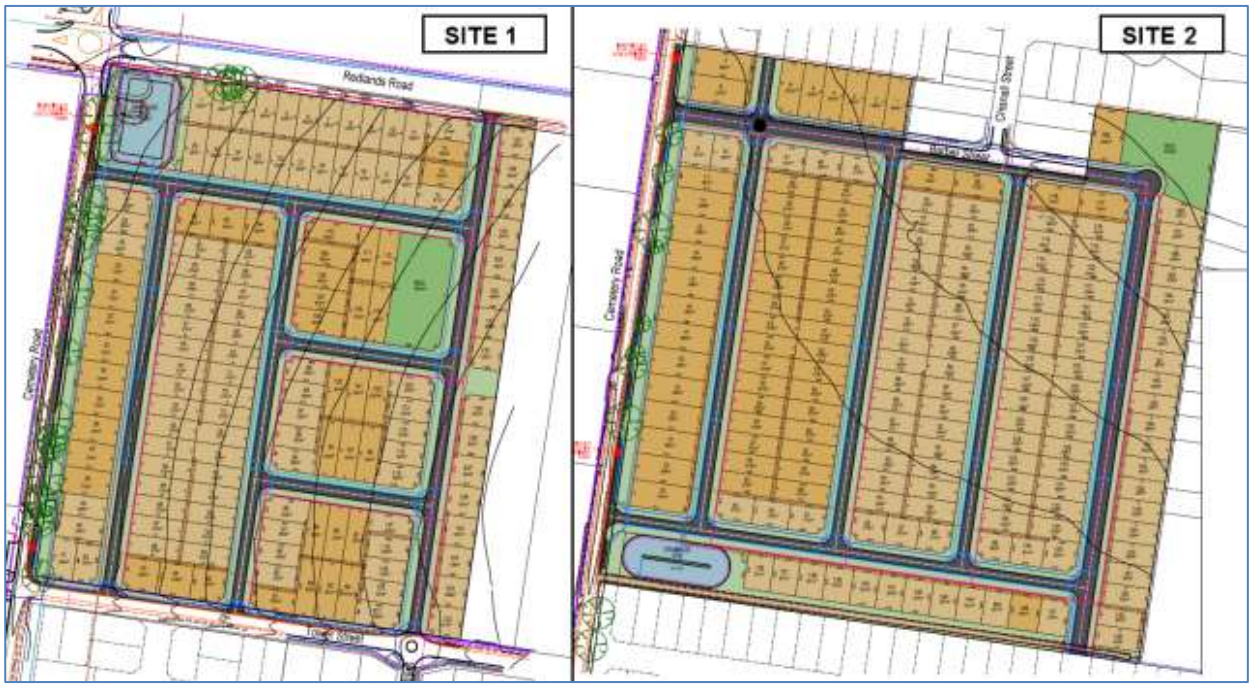


Figure 5.1: Internal Road Network

The internal road network consists of 5 local access roads and 1 collector road for Site 1 and 4 local access roads and 2 collector roads for Site 2. These internal roads will provide access to 288 of the proposed lots, whilst the remaining lots (18) will be accessed directly from the existing road network (11 from Redlands Road and 7 from Tower Street).

The characteristics of the internal roads can be designed generally in accordance with those specified in Federation Council's 'Engineering Guidelines for Subdivisions and Development Standards, Part 2: Design of Roads' (Nov 2018), with the aspects of the guideline considered to be appropriately outlined in Table 5.2.

The development plans indicate that less than 100 residential lots will be served by each of the internal roads before connecting to either Cemetery Road or Redlands Road, and that the reservation widths throughout both sites are shown as being either 20 or 22 metres, both of which satisfies the design requirements, and are therefore sufficient to accommodate the remaining design requirements shown below.

Table 5.2: Characteristics of Roads in Residential Subdivision Road Networks (Local Access)

Classification of Road	Local Access	Collector
No. of Dwellings Served	100	300
Min. Carriageway Widths (m)	8	11
Min. Verge Width (m)	2 x 5.7	2 x 3.35
Min. Road Reserve (m)	20	22
Lane Provision	2 Moving + Intermittent Parking	2 Moving + Parking
Maximum Desirable Speed (km/h)	20 – 30	30 – 50
Maximum Design Speed (km/h)	40	60
Footpath Requirement (m)	1.5 on one side	2.5m wide shared cycleway verge on one side + 1.5 one other
Kerb and Gutter	Semi Mountable	150mm high integral barrier

5.3 Lot Access and Off-Street Parking

Residential subdivisions do not generate any off-street parking demand, however the future development of each individual lot will. Federation Council's *Corowa Shire Development Control Plan* (2013) requires parking be provided in accordance with Clause 3.16 of Part 3.3.4 of the *State Environmental Planning Policy (Exempt and Complying Development Codes) 2018*, which states the provision of at least 1 off-street car parking space per residential dwelling. Given that the residential lots all range from 551-672 square metres in size, it is considered that there is sufficient area to accommodate a dwelling and at least 1 on-site car parking space.

Crossovers for the lots accessed directly from Redlands Road have been shown on the development plans, with ten of the twelve lots having shared crossovers, and the western-most crossover located approximately 50 metres from the existing roundabout. The crossovers and there locations are considered appropriate given the recommended speed limit reduction mentioned in Section 5.1.

Each of the remaining lots has a minimum road frontage of 14.5 metres, and with maximum width of a residential vehicle crossing being 5 metres, has the ability to provide at least 1 on-street parking per 2 lots between crossings, as stated in the Federation Council's 'Engineering Guidelines for Subdivision and Development Standards, Part 2: Design of Roads' (Nov 2018).

Therefore it is considered that the development will not generate any adverse on-street parking demand that will impact on the surrounding road network.

5.4 Pedestrian Facilities

A pedestrian footpath shall be provided along one side of each of the carriageways, and be designed in accordance with AustRoads *Guide to Road Design Part 6A: Pedestrian and Cyclist Paths*. The footpaths shall be a minimum 1.5 metres wide and provide connection to any existing external footpath network.

5.5 Bicycle Facilities

Due to the low volumes of traffic anticipated along the proposed internal local access roads within the site (AADT <1,000), it is considered that no dedicated bicycle facilities are required, and the cyclist can utilise the carriageway.

5.6 Service Vehicle Access and Circulation

Swept path diagrams have been prepared for one of the typical T-intersections within the internal road network to assess the ability for a service vehicle, such as a garbage truck or fire appliance to circulate the site. The 'Large Refuse Vehicle' was used in the assessment, as it represents the largest typical service vehicle. The dimensions of this vehicle can be seen in the diagrams attached in Appendix B.

The swept paths confirm that with the road characteristics based on those mentioned in Table 5.1, the design of the internal road network is appropriate to accommodate service vehicles.

The development plans also indicates several locations for possible bus stops along Cemetery Road to accommodate for the potential demand generated by the development. Given no access is provided to the proposed residential lots that front Cemetery Road, it is recommended that any required bus stops be located proximate to intersections, and not midblock, as these locations are better connected to the subdivision via the proposed internal footpath network.

As such, it is not necessary for the bus route to travel through the proposed subdivision, so no analysis has been undertaken on the internal road network.

6 Summary and Conclusions

The proposed subdivision of the land at Cemetery Road, Corowa is summarised in a traffic and parking context as follows:

- The proposed subdivision consists of a total of 306 residential lots, comprising of two sites, one with 137 lots and the other with 169 lots.
- The proposal is anticipated to generate approximately 2,265 daily vehicle trips once fully occupied, with AM and PM peak traffic volumes of 261 vehicles per hour and 276 vehicles per hour respectively.
- A SIDRA analysis of the intersection of Redlands Road and Cemetery Road, and of Tower Street and Chisnall Street indicates that with the additional traffic generated by the proposal, the intersections will continue to operate satisfactorily both post development and for 30 years in the future.
- The proposed internal road network can be appropriately designed in accordance with the Federation Council's *Engineering Guidelines for Subdivision and Development Standards, Part 2: Design of Roads (Nov 2018)*.
- Basic turning treatments are required for the one major connection with Redlands Road based on existing traffic volumes, however the cross section design of Redlands Road includes provision for a parking lane/turn lane which provides adequately for the 30 year design horizon.
- The Cemetery Road carriageway will require an upgrade from a rural road to a local distributor road, however will not require parking along the site's frontage given no accesses to lots are proposed along Cemetery Road.
- It is recommended that speed limits on Redlands Road and Cemetery Road, along the frontage of the site, be reduced to 60 km/h.
- Access and on-site parking, in addition to on-street parking for each lot can be accommodated in accordance with the Federation Council's *Engineering Guidelines for Subdivision and Development Standards, Part 2: Design of Roads (Nov 2018).*
- Pedestrian provision can be provided in accordance with Federation Council's *Engineering Guidelines for Subdivision and Development Standards, Part 2: Design of Roads (Nov 2018)* and AustRoads *Guide to Road Design Part 6A: Pedestrian and Cyclist Paths*.
- Swept path diagrams confirm that proposed road characteristics are appropriate for service vehicle access and circulation.

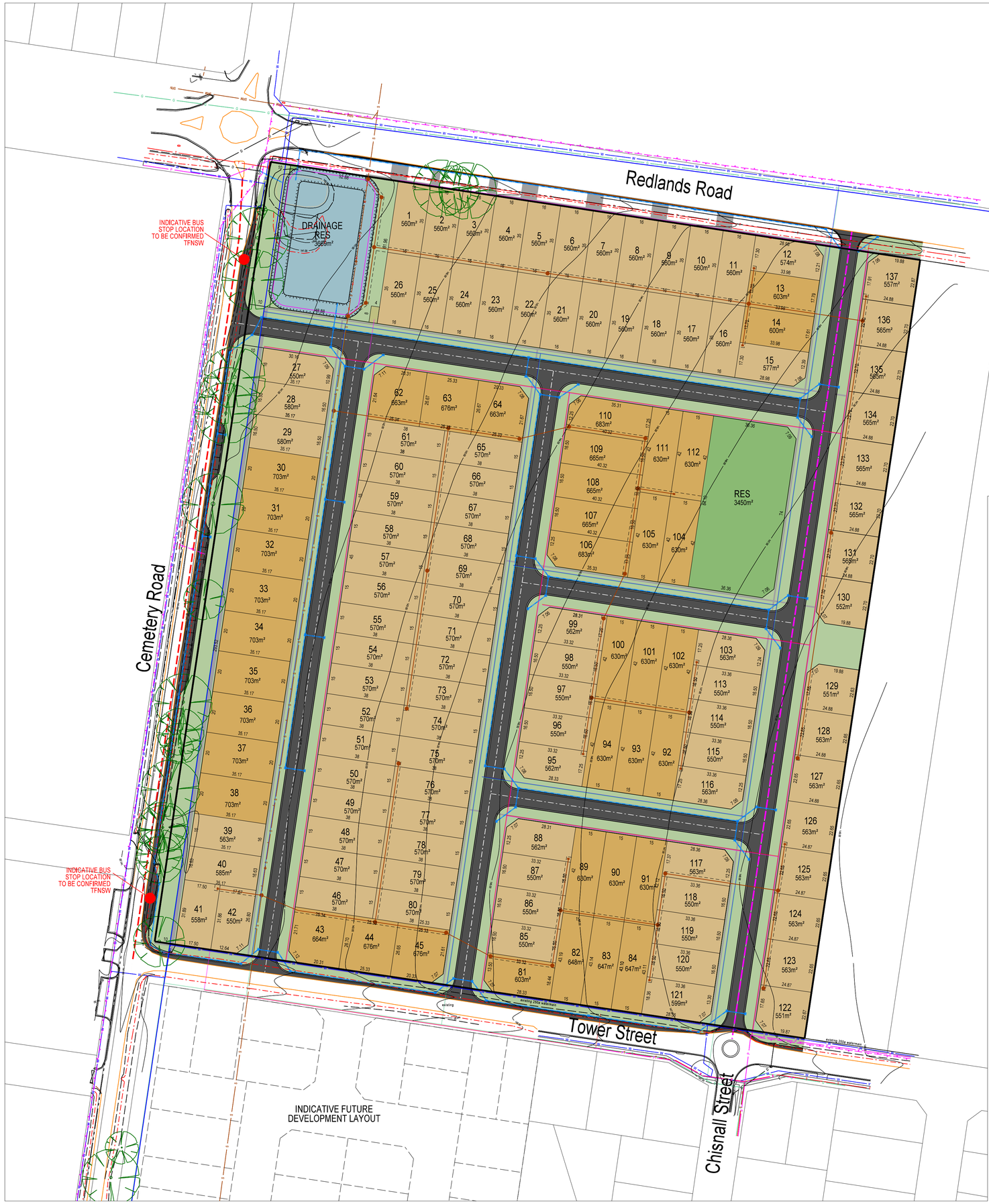
There are no traffic or parking grounds which should warrant refusal of the sought Planning Permit.

TTM Consulting (Vic) Pty Ltd

Joldy Bradley

Appendix A: Subdivision Plan

CONCEPT DEVELOPMENT PLAN 1A



LEGEND

Residential lots
550 - 600m²

Residential lots
> 600m²

Reserve

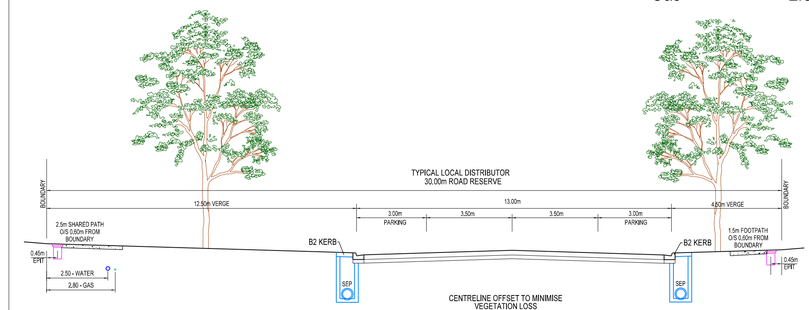
Existing trees to be retained subject to further investigation

Proposed location of storm water detention and treatment basin landscaped to form a feature of the site

Indicative cycle/pedestrian connections through the site

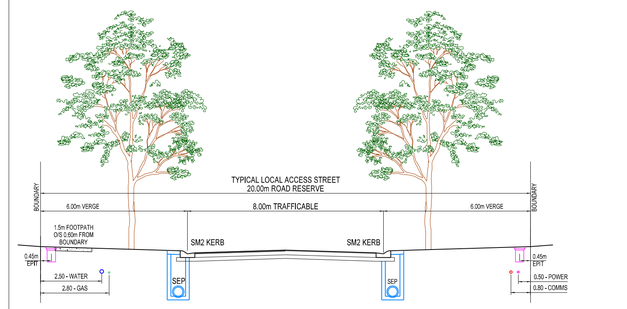
Indicative bus stop location final location to be determined by Transport for NSW

Proposed Service	Typical Offset
Water	2.50m
Sewer	1.50m
Power	0.50m
Telstra/NBN	0.80m
Gas	2.80m

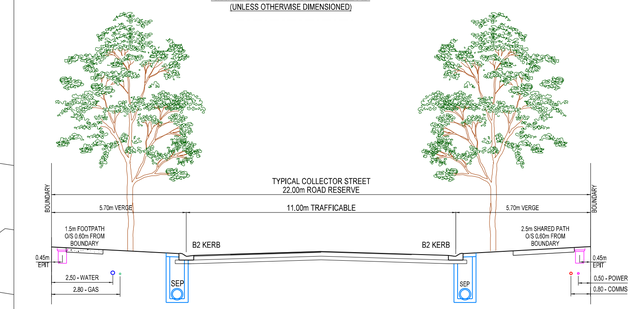


CENTRELINE OFFSET TO MINIMISE VEGETATION LOSS

STANDARD SERVICES ALLOCATIONS & OFFSETS (UNLESS OTHERWISE DIMENSIONED)



STANDARD SERVICES ALLOCATIONS & OFFSETS (UNLESS OTHERWISE DIMENSIONED)



STANDARD SERVICES ALLOCATIONS & OFFSETS (UNLESS OTHERWISE DIMENSIONED)

This plan is for approval purposes only and represents indicative outcomes for future assessment and review.
This plan is also based on preliminary information and is subject to Council approval.

DATE	DESCRIPTION	VERSION
21-07-21	For Comment	5
17-05-21	For Comment	4
06-07-20	For Comment	3
16-04-20	For Comment	2
31-10-19	For Comment	1

REVISION STATUS

NORTH EAST SURVEY DESIGN
ABN 83 127 459 367
PO Box 882
Wangaratta VIC 3676
Mobile 0407 216 710
Fax 03 5721 6701
matt@nesd.com.au
www.nesd.com.au

For: Enth Degree Architects
At: Corowa

CONCEPT DEVELOPMENT PLAN
Redlands Road
Corowa

Project No: M6937 Version: 5
Drawn by: MB Checked/Signed By: MS

Scale: 1:2000 @ A3 / 1:1000 @ A1

Status: FOR COMMENT

Print Date: $DATE$
Drawing Name: $MODEL$
File Name: $FILE$

CONCEPT DEVELOPMENT PLAN 1B

LEGEND

Residential lots
550 - 600m²

Residential lots
> 600m²

Reserve

Existing trees to be retained subject to further investigation

Proposed location of storm water detention and treatment basin landscaped to form a feature of the site

Indicative cycle/pedestrian connections through the site

Indicative bus stop location final location to be determined by Transport NSW

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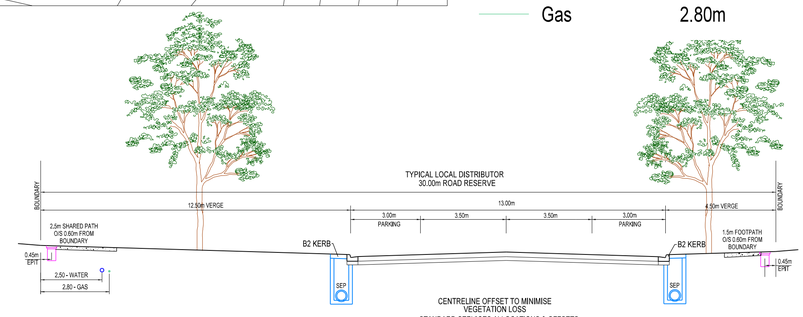
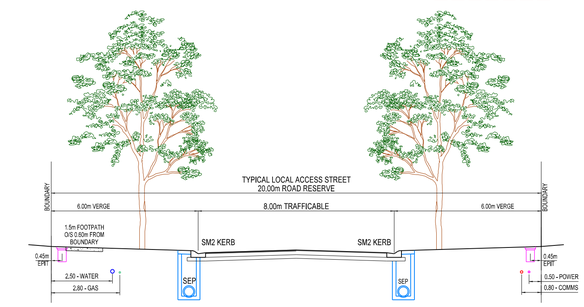
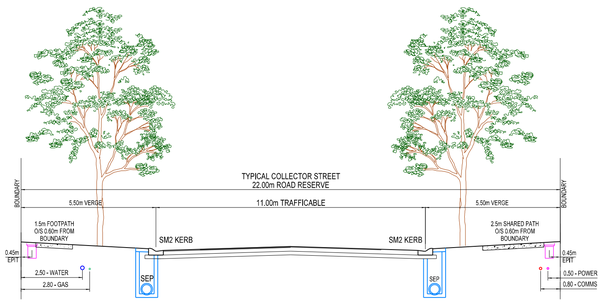


CENTRELINE OFFSET TO MINIMISE VEGETATION LOSS
STANDARD SERVICES ALLOCATIONS & OFFSETS (UNLESS OTHERWISE DIMENSIONED)



STANDARD SERVICES ALLOCATIONS & OFFSETS (UNLESS OTHERWISE DIMENSIONED)



STANDARD SERVICES ALLOCATIONS & OFFSETS (UNLESS OTHERWISE DIMENSIONED)

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16-04-20	For Comment	3
06-07-20	For Comment	2
31-10-19	For Comment	1

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CONCEPT DEVELOPMENT PLAN
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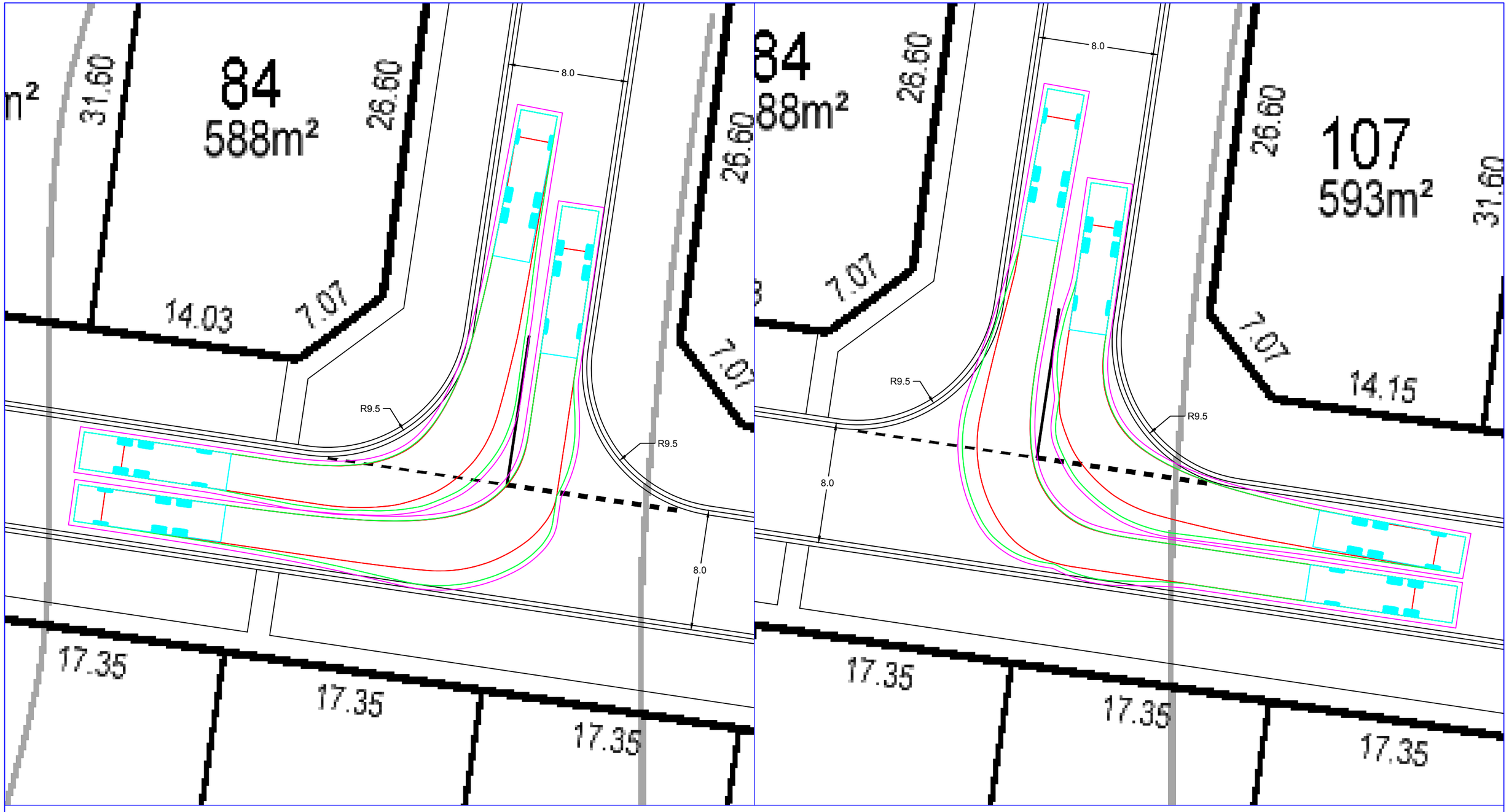
Scale: 1:2000 @ A3 / 1:100 @ A1

Status: FOR COMMENT

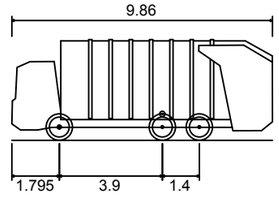
Print Date: $DATE$
Drawing Name: $MODEL$
File Name: $FILE$

Appendix B: Swept Path Diagrams



Swept Path Diagram Prepared using AutoTrack v11

Wheel path
Vehicle Overhang
Vehicle Overhang + 300mm Clearance



Large Refuse Vehicle (3 axle)

Overall Length	9.860m
Overall Width	2.450m
Overall Body Height	3.814m
Min Body Ground Clearance	0.366m
Track Width	2.450m
Lock-to-lock time	4.00sec
Curb to Curb Turning Radius	9.500m

REV.	DATE	AMENDMENT DESCRIPTION	DRAWN	CHECKED	APPROVED
A	31-01-20	ORIGINAL ISSUE	JB		

SCALE 0 2.5 5 7.5 10 12.5m
SCALE 1:250 AT ORIGINAL SIZE

NORTH

CLIENT
CLIENT

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PROJECT
CEMETERY ROAD, COROWA

DRAWING TITLE
SWEPT PATH DIAGRAMS
PROPOSED SUBDIVISION OF LAND

PROJECT NUMBER	ORIGINAL SIZE
10736	A3
DRAWING NUMBER	REVISION
1073601-1	A
DATE	SHEET
31 JAN 2020	1 OF 1