Proposed Rezoning for Residential Subdivision
137 Brisbane Grove Road, Brisbane Grove

Traffic and Access Assessment Report

Prepared for: Euchie Pty Ltd

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1. Introduction

This report has been prepared on behalf of Euchie Pty Ltd to present findings of a traffic and access assessment of the proposed rezoning to provide 21 lot rural residential subdivision of the site known as 137 Brisbane Grove Road, Brisbane Grove.

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; and
- Section 5 presents the conclusions

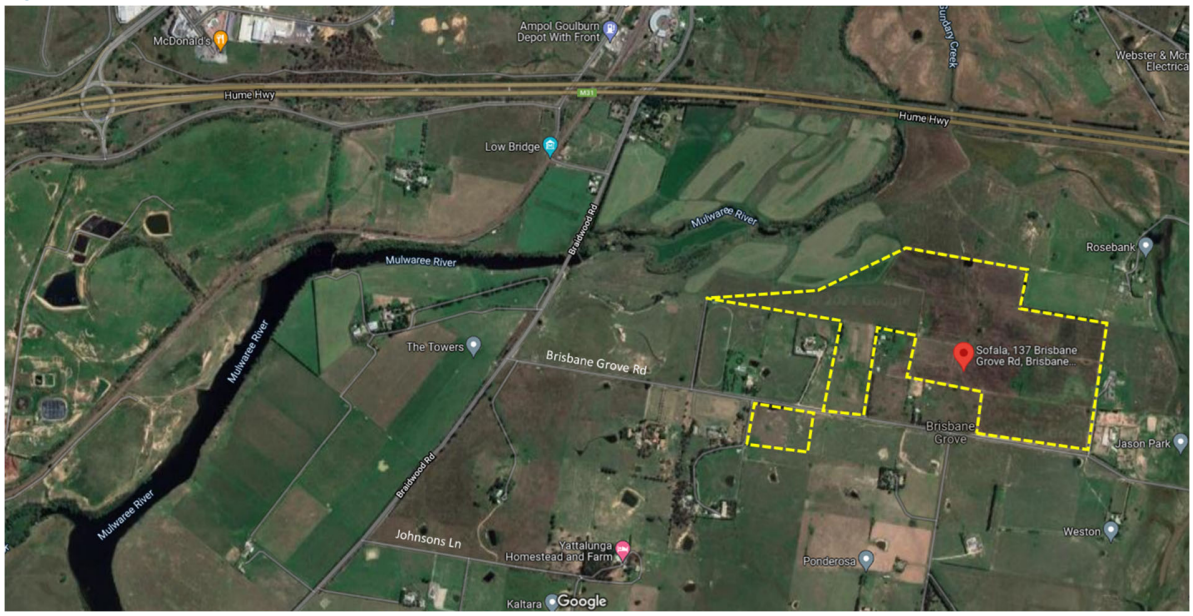
2. Existing Development / Conditions

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

2.1 Site Location

The proposed site for subdivision is located south of the Goulburn City Centre and south of the Hume Highway. All land parcels within the subject site currently do not include any residential dwellings. The location of the development site is shown in **Figure 1**.

Figure 1 - Site Location



Source: Nearmap

2.2 Existing Site Traffic Generation

As stated above the existing site does not include any residential dwellings and thus does not currently generate any traffic.

2.3 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).

2.4 Existing Road Network

Braidwood Road – is a key collector road through the local area linking the Goulburn City Centre in the north (via an underpass under the Hume Highway) to regional suburbs in the south including Springfield and Tarago. At its intersection with Brisbane Grove Road, the road includes a single lane of travel in each direction with 1.0-1.5m wide asphalt shoulders and a posted speed limit of 100km/hr.

Brisbane Grove Road – is a local east-west street liking Braidwood Road in the west with Windellama Road in the east. The intersection of Braidwood Road / Brisbane Grove Road includes a priority-controlled intersection in a BAL arrangement with a 60m left turn lane for southbound traffic in Braidwood Road. Brisbane Grove Road includes a pavement width of 5.5m – 6.0m and unformed shoulders on either side. The road includes a posted speed limit of 80km/hr.

The existing intersection arrangements of Braidwood Road / Brisbane Grove Road are shown below in **Figure 2**.

Figure 2 – Existing BAL Intersection Arrangements of Brisbane Grove Road / Braidwood Road

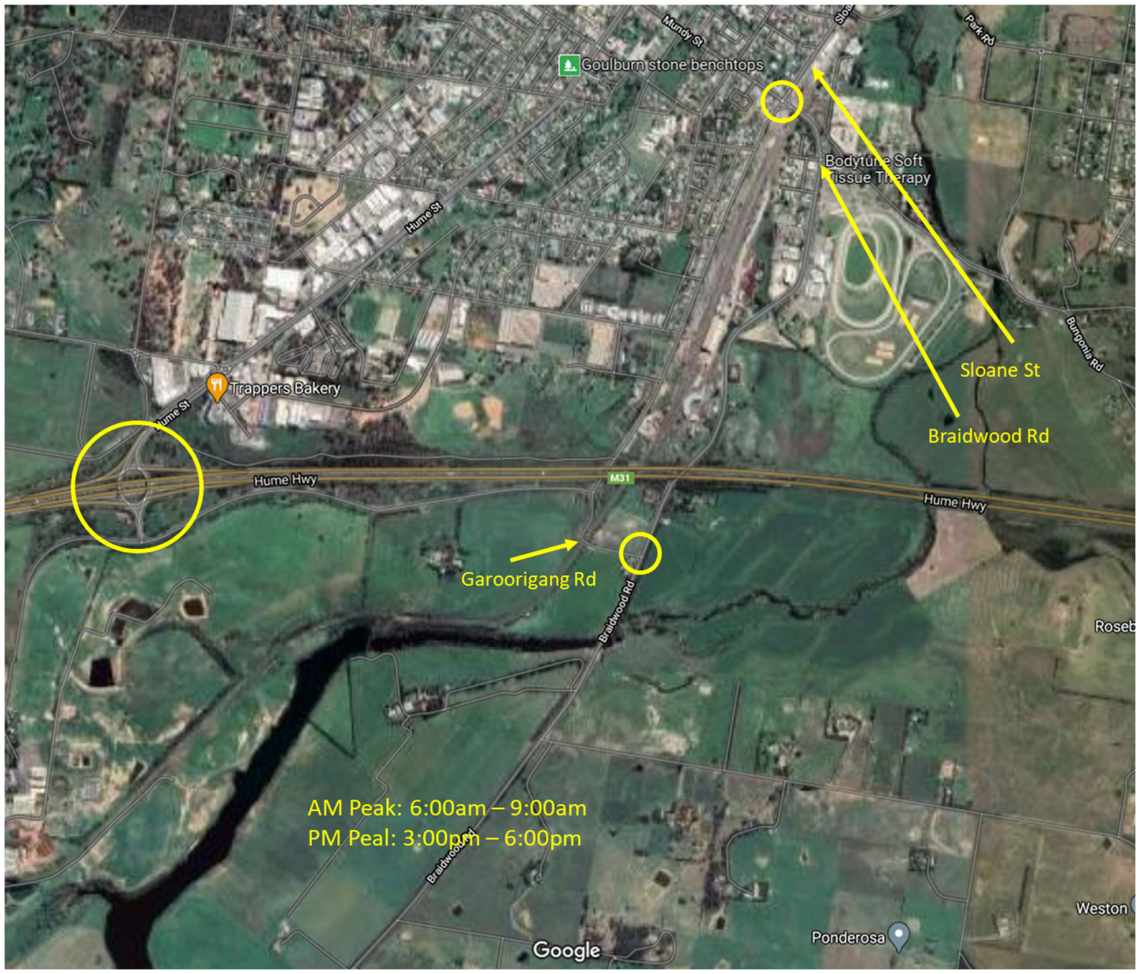
Garoorigang Street – is a local street linking Braidwood Road to the Hume Street grade separated interchange roundabout. The street provides an underpass (2.7m height clearance) and includes a priority-controlled intersection with Braidwood Road. The street includes a pavement width of approximately 6.5m with unformed shoulders and a posted speed limit of 80km/hr.

2.5 Existing Traffic Flows

To gauge existing traffic flows on the surrounding road network an intersection counts were undertaken at a number of locations around the development site. The identified locations for weekday AM / PM peak period counts are shown below in **Figure 3** and include:

1. Hume Highway / Hume Street Grade Separated Interchange
2. Sloane Street / Braidwood Road / Mundy Street; and
3. Braidwood Road / Garoorigang Street

Figure 3 – AM / PM Peak Period Count Locations



Copies of all intersection counts can be found in **Appendix A** of this report. The peak flows by direction in each street at each intersection 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
Hume Street	North of Hume Highway	370	392	529	444
	South of Hume Highway	68	41	161	50
Garoorigang Street	West of Braidwood Road	21	74	55	80
Braidwood Road	East of Sloane Street	175	127	308	250
	North of Garoorigang Street	63	89	83	94
	South of Garoorigang Street	128	101	149	135

From **Table 1** it can be seen that existing flows on surrounding roads are in generally in line with their classification. Further, peak hour traffic volumes in Braidwood Road south of Garoorigang Street are quote low in the vicinity of the development site.

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

Table 2 – 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 3**.

Table 3 – 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
Braidwood Road – South of Garoorigang Street	1,800	229	0.128	284	0.158
Garoorigang Street – West of Braidwood Road	1,800	95	0.052	135	0.075
Hume Street – South of Hume Highway	1,800	109	0.061	211	0.117

From **Table 3** it is evident that roads immediately in the vicinity of the development site have significant spare mid block capacity.

2.6 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 4.**

Table 4 – 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 5.** 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 5 – Existing Weekday AM / PM Intersection Operating Conditions

Intersection	Control	Weekday AM Peak		Weekday PM Peak	
		Av Delay	LOS	Av Delay	LOS
Braidwood Rd / Sloane St	Priority	8.6	A	12.4	A
Braidwood Rd / Garoorigang St	Priority	6.1	A	6.3	A
Hume St / Garoorigang St	Roundabout	10.3	A	10.3	A

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

From **Table 5** it is noted that all intersections in the vicinity of the development site currently operate at a satisfactory level of service with spare capacity.

Copies of the SIDRA outputs are provided in **Appendix B** of this report.

2.7 Goulburn Mulwaree Council Urban Fringe Strategy

It is noted that the subject site is located within the land confines 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.

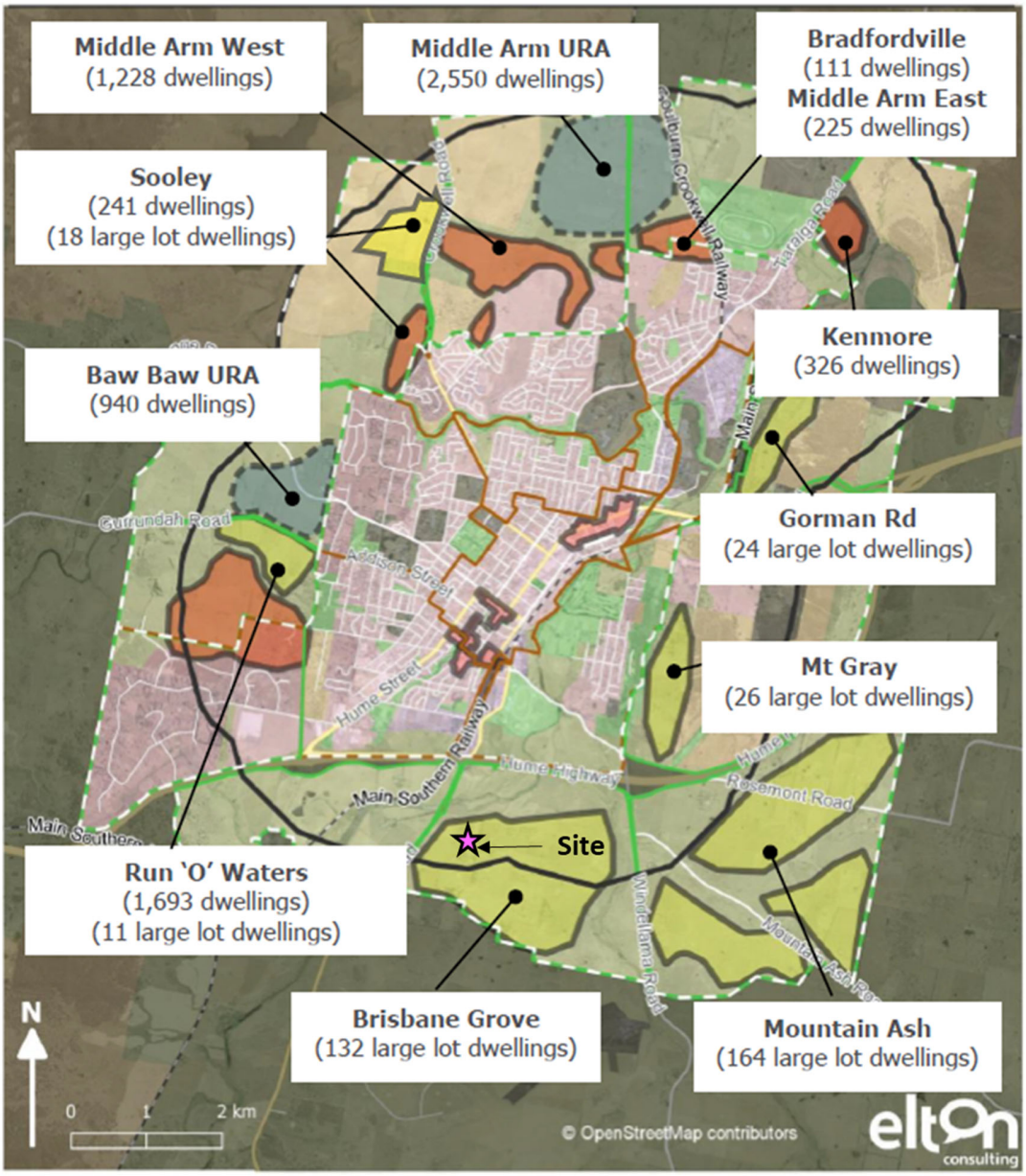
The scope of the Strategy includes looking at the urban areas of Goulburn and Marulan and identifying opportunities for an additional recommended 3,500 dwellings over the next 18 years to 2036.

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 4**.

[1] Goulburn Mulwaree Council Urban Fringe Strategy – Elton Consulting 2020

Figure 4 – Site Location within Goulburn Mulwaree Council Urban Fringe Strategy Precincts



3. The Proposed Development

The key components of the proposed development are summarised below

- A rezoning proposal to provide for a total of twenty one (21) rural residential lots (> 2.0Ha in size).
- Two (2) new local road intersection connections with Brisbane Grove Road to serve the development.
-

Plans of the proposed development can be found in **Appendix C** 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

The adopted traffic generation rates applied to the proposed development of each site are the *maximum* traffic generation rates for regional areas of 0.90 trips per dwelling in the AM peak and 0.85 trips per dwelling in the PM peak. 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.

Therefore, the prosed development of 21 rural residential lots would have the potential to generate

- Total AM peak traffic generation 19 vehicle trips two way
- Total Inbound AM peak traffic generation: 4 vehicle trips
- Total Outbound AM peak traffic generation: 15 vehicle trips
- Total PM peak traffic generation: 18 vehicle trips two way
- Total Inbound PM peak traffic generation: 15 vehicle trips
- Total Outbound PM peak traffic generation: 3 vehicle trips

Overall, the potential traffic generation of the yield which would be achieved in the proposed rezoning would be low.

4.3 Trip Distribution

It is unlikely any peak hour traffic generation of the site would travel to / from the site to the south along Braidwood Road given low employment would be provided by Goulburn to the north along with direct access to the Hume Highway for longer commuter generated trips say to Canberra. Thus, conservatively *all* traffic would travel to / from the site via Braidwood Road. This allows for a conservative Austroads assessment as detailed below.

4.4 Other Known Developments

Positive Traffic Pty Ltd prepared a traffic impact assessment report for the proposed subdivision of 2 Brisbane Grove Road, Brisbane Grove located immediately west of the subject site. At the time of preparing this report the application for the subdivision was being considered by Council.

The proposal included sixteen (16) rural residential lots with access via Brisbane Grove Road. For the future conditions assessment below, the traffic generation from the development of No.2 Brisbane Grove Road, Brisbane Grove has been included in the assessment.

4.5 Future Mid-Block Capacity Conditions

The additional traffic generated by the proposed subdivision has been added to the immediate surrounding network in accordance with the adopted distribution of trips presented in Section **0** resulting in the following future mid-block capacity conditions.

Table 6 – 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
Braidwood Road – South of Garoorigang Street	1,800	263	0.146	315	0.175
Garoorigang Street – West of Braidwood Road	1,800	100	0.056	139	0.077
Hume Street – South of Hume Highway	1,800	114	0.063	216	0.12

From **Table 6** it is noted that upon full development of the proposed subdivision (including the subdivision of 2 Brisbane Grove Road, Brisbane Grove) there would be negligible change in the volume capacity ratios on roads immediately surrounding the proposed development.

4.6 Future Intersection Operating Conditions

The additional traffic generated by the proposal (and the site at No.2 Brisbane Grove Road, Brisbane Grove) 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 7**.

Table 7 – Future Weekday AM / PM Intersection Operating Conditions

		Weekday AM Peak		Weekday PM Peak	
Intersection	Control	Av Delay	LOS	Av Delay	LOS
Braidwood Rd / Sloane St	Priority	8.7	A	12.7	A
Braidwood Rd / Garoorigang St	Priority	6.3	A	6.4	A
Hume St / Garoorigang St	Roundabout	10.3	A	10.3	A

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

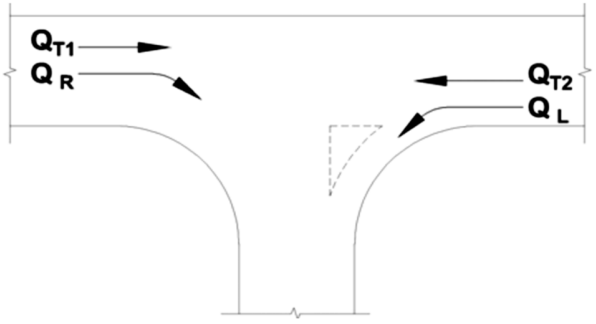
From **Table 7** it is noted that the intersection surveyed in the vicinity of the proposed development would all continue to operate at a satisfactory level of service in the future upon full development of the subject site and the full development of the site at No.2 Brisbane Grove Road, Brisbane Grove. Further, there would be no requirement for upgrades at the intersection to accommodate the traffic demands of the proposal.

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

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

4.7 Brisbane Grove Road / Braidwood Road – Austroads Assessment

The future traffic conditions of the main access intersection to the site have been assessed in accordance the requirements of Austroads for a posted speed limit of greater than 100km/hr. The values of Q(m) have been calculated in accordance with AustRoads as shown below.



Road type	Turn type	Splitter island	Q_M (veh/h)
Two-lane two-way	Right	No	= $Q_{T1} + Q_{T2} + Q_L$
		Yes	= $Q_{T1} + Q_{T2}$
	Left	Yes or no	= Q_{T2}
Four-lane two-way	Right	No	= 50% x $Q_{T1} + Q_{T2} + Q_L$
		Yes	= 50% x $Q_{T1} + Q_{T2}$
	Left	Yes or no	= 50% x Q_{T2}
Six-lane two-way	Right	No	= 33% x $Q_{T1} + Q_{T2} + Q_L$
		Yes	= 33% x $Q_{T1} + Q_{T2}$
	Left	Yes or no	= 33% x Q_{T2}

Brisbane Grove Road (including Corrinyah Road) serves a total of twenty (20) residential lots and conservatively it has been assumed *all* generated traffic travels through the intersection. The existing versus future Q(m) volumes for the application of Figure 4.9 b) are provided below:

Existing

AM

Left Turn Q(L) = 4

PM

Left Turn Q(L) = 16

Future

AM

Left Turn Q(m) = 8

PM

Left Turn Q(m) = 31

The resulting application of Figure 2.25 of AustROADS Part 6 of this intersection for the AM and PM peak periods existing and in the future post development are shown below in **Figure 5** and **Figure 6**.

Figure 5 – Existing Brisbane Grove Road / Braidwood Road Austroads Intersection Assessment

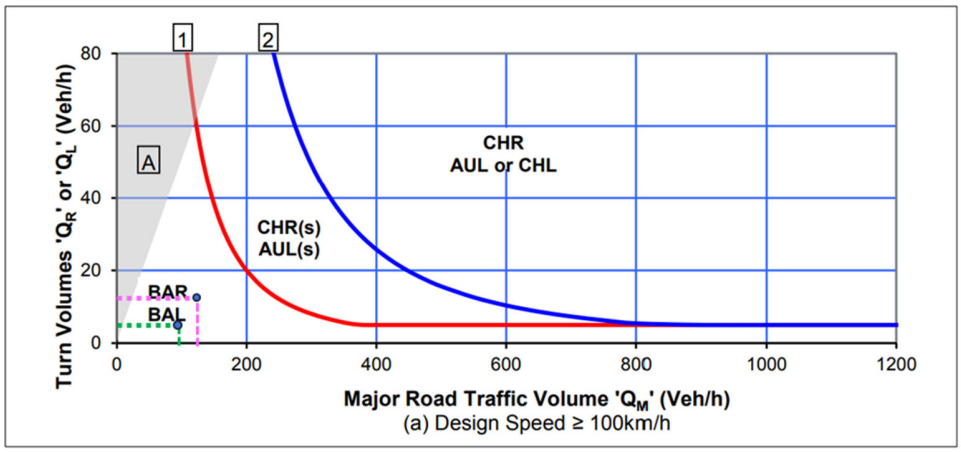
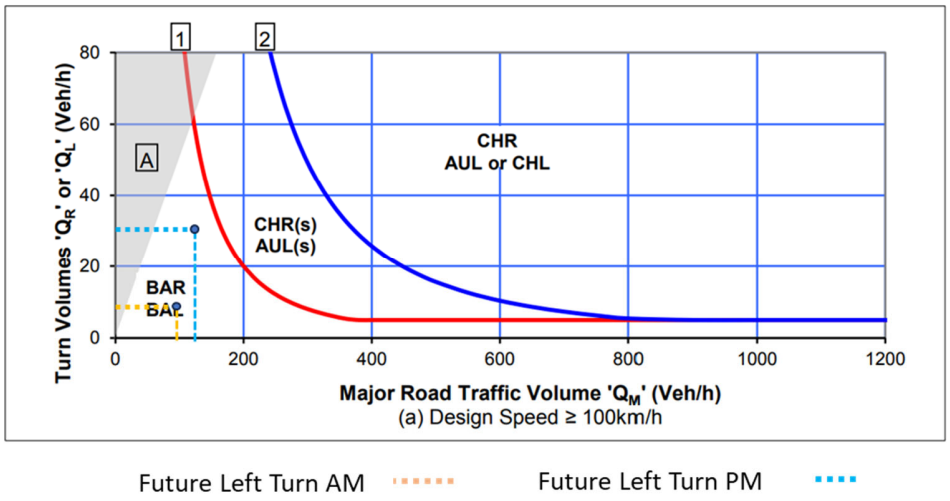


Figure 6 – Future Brisbane Grove Road / Braidwood Road Austroads Intersection Assessment



As confirmed above in **Figure** 6, The application of Figure 2.25 of AustROADS Part 6 for future conditions, the existing BAL intersection arrangement would more than cater for the full traffic generation of the site in its current form and is considered satisfactory with no further upgrades of the intersection required to accommodate the development.

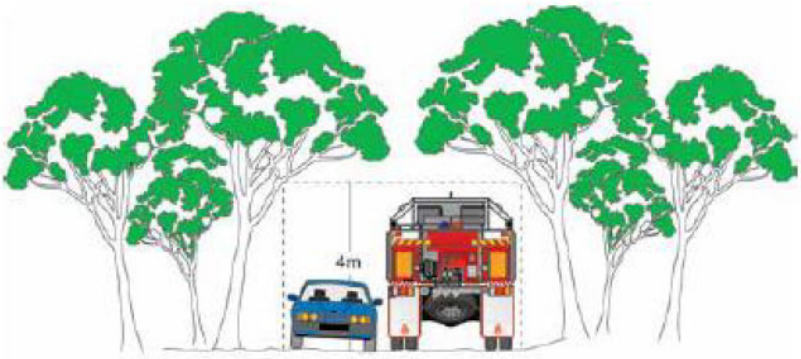
Therefore, the traffic impacts of the proposal are considered satisfactory.

4.8 Access Arrangements - Bushfire

It is noted from the Strategic Bushfire Study report[2] the following is noted on the matter of bushfire evacuation for the subject development:

[2] Land Rezoning Proposal 137 Brisbane Grove Road, Brisbane Grove Strategy Bushfire Study – Sowdes November 2021

Table 7.4a 'Access' of "Planning for Bush Fire Protection" (2019) requires that an alternate escape route be made available if the distance from the nearest arterial road to the dwelling site is greater than 200 metres, and that the minimum width for internal access roads be four metres plus one metre either side which is maintained to provide a clear opening of four metres between ground level and any overhanging vegetation in accordance with the below Figure. There must also be a turning provision of not less than 12 metres near to the dwelling site which will allow emergency services vehicles clear access to the dwelling.



General construction requirements for internal property access roads in rural areas as prescribed by the NSW Rural Fire Service

Further, the proposed design would ensure access to all dwellings for fire vehicles would fully comply with the minimum requirements of the NSW Rural Fire Service Guidelines for Single Residential Development would be achieved within the design. These include:

The following identifies the requirements from PBP 2019 that are required for property access.

Not all access requirements will be applicable to a particular development due to site specific conditions (e.g. some dwelling sites may be located physically close enough to a public road to avoid the need for passing bays). However where compliance with the following requirements is not possible, a performance based solution may be needed.

There are no specific access requirements in an urban area where an unobstructed path (no greater than 70m) is provided between the most distant external part of the proposed dwelling and the nearest part of the public access road (where the road speed limit is not greater than 70kph) that supports the operational use of emergency firefighting vehicles.

5. Conclusions

This report has reviewed the potential traffic impacts of the proposed twenty one (21) lot rural residential subdivision at the known as 137 Brisbane Grove Road, Brisbane Grove. 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. The existing BAL intersection arrangement of Brisbane Grove Road / Braidwood Road would not require upgrade to accommodate the potential traffic generation of the proposed development.
4. The proposed design would ensure fire vehicle access to properties fully complies with the requirements of the NSW Rural Fire Service Single Dwelling Guidelines.

Overall the traffic impacts of the proposal are considered acceptable.

6. Appendix A – Intersection Counts

7. Appendix B – SIDRA Outputs

8. Appendix C - Plans of Proposed Development