

Turning Warrants Assessment

Proposed Community Title Subdivision
Development

Prepared for

Pasialis Super Fund & Cafabe Pty Ltd

Site address

Lot 3

DP 846470

48 Jervis Bay Road, Falls Creek, NSW, 2540

Date

7th February 2020

allen price & scarratts pty ltd
land and development consultants

Surveying



Town Planning



Civil Engineering



Project Management



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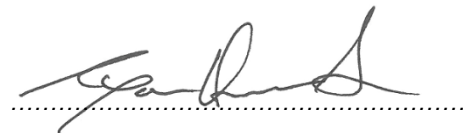
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Rev	Date	Details
0	February 2020	ISSUED FOR CONCEPT APPROVAL

Introduction

This assessment has been prepared to support a Planning Proposal over the land known as 48 Jarvis Bay Road, Falls Creek for a 14 lot community title subdivision.

Allen, Price & Scarratts Pty Ltd have been engaged to prepare this Turning Warrants Assessment to supplement the traffic assessment already prepared and integrated within Section 5.3.3 of the Statement of Environmental Effects. This includes consideration of existing and proposed traffic volumes and peaks, V85 traffic speeds, traffic generation and assess these against the Turning Warrants provided in Austroads Guide to Traffic Management Part 6 2019.

For a description of the proposed development and existing site / locality see the Statement of Environmental Effects and Planning Report ref 15/97 prepared by Cowman Stoddart Pty Ltd.

Existing traffic volumes for turning warrant assessments

The provided traffic data from Jarvis Bay Road was sampled at two locations in 2016. The data has been filtered for direction and extrapolated at an anticipated 3% per annum growth rate (standard adopted by SCC for rural areas) to adjust the data to 2019, with a further forecast of 10 years for 2029 also being provided. In addition, a seasonal fluctuation of 10% is also considered. See the table below for a summary of the data.

		2016		2020		2029	
		AADT	Veh/h (peak)	AADT	Veh/h (peak)	AADT	Veh/h (peak)
Location 1	Northbound	3,858	606	4,343	683	5,836	917
	Southbound	3,946	663	4,442	747	5,969	1,003
Location 2	Northbound	3,866	609	4,352	686	5,848	922
	Southbound	3,968	667	4,467	751	6,002	1,009
Adopted Averages	Northbound	3,862	608	4,348	685	5,842	920
	Southbound	3,957	665	4,455	749	5,986	1,006
Seasonal	Northbound	4,249	669	4,783	754	6,427	1,012
	Southbound	4,353	732	4,901	824	6,585	1,107

It can be seen from the vehicle count data supplied that a slight 'commuter' pattern is formed with the peak northbound traffic occurring in the morning and southbound peak occurring in the afternoon. This split is not as large as we would typically expect to see, suggesting that there is a significant commuter presence heading towards the Princes Highway as well as the south-eastern townships in this area. The percentage peak split is approximately 60:40 and this same split ratio will be applied to the new development traffic to determine an approximate distribution for travel direction.

Traffic Generation Estimations

Section 5.3.3 of the Statement of Environmental Effects and Planning Report has determined that the development will generate 120 vehicle trips per day with a peak hour of 12 vehicles.

As the development size is fixed (without future approvals) there is no anticipated growth factor to be applied to these rates, however they would still be subject to seasonal fluctuations which will be considered in the turning warrant assessments.

As per the above section, the anticipated travel direction split is at a 60:40 ratio and hence we will assume that of the 12 peak hour vehicle trips generated by the development 7 will be northbound in the morning with the remaining 5 heading south. This will then flip for the evening traffic flows.

Turning Warrants

Austroroads Guide to Traffic Management Part 6 details Intersections, Interchanges and Crossing requirements at roadway intersections. AGTM Part 6 Figure 2.25 lists the turning warrant charts as applicable to unsignalized intersections for various design speeds. As the existing speed zone is 100km/h and V85 is assessed in the SoEE Section 5.3.3 as between 98.3km/h and 103.7km/h it is considered appropriate to adopt 100km/h as the design speed.

It can be seen that the relevant equations for a two-lane two-way road for right and left turns are:

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}

First considering the right turning movement, as no splitter island is currently proposed the equation becomes:

$$Q_M = Q_{T1} + Q_{T2} + Q_L$$

To determined Q_M for the right turn we need to consider traffic in a particular time selection. For the maximum value of Q_L we would consider this turn to occur in the evening when the peak commuting traffic will be returning to the development. This will coincide with the peak southbound traffic average representing Q_{T1}, however Q_{T2} will not coincide with the northbound peak as it is established that occurs in the morning. We therefore adopt an average 85% peak value for the opposing traffic regardless of direction which is 335 veh/h in 2016. This yields:

$$\begin{aligned} Q_{M-2020} &= 749 + 377 + 7 &= 1,133 \\ Q_{M-2029} &= 1,006 + 507 + 7 &= 1,520 \\ Q_R &= 7 \end{aligned}$$

For the left turn the calculation is much simpler however there are two distinct possibilities. If we assess when Q_{T2} is at maximum (northbound AM peak) then Q_L will be nearly non-existent as there will be very little traffic desiring to enter the subdivision coming from the south. Alternatively, if we assess when the expected Q_L maximum will occur (southbound PM peak) we get the much lower Q_{T2} value established above of 335veh/h. Hence two options are plotted:

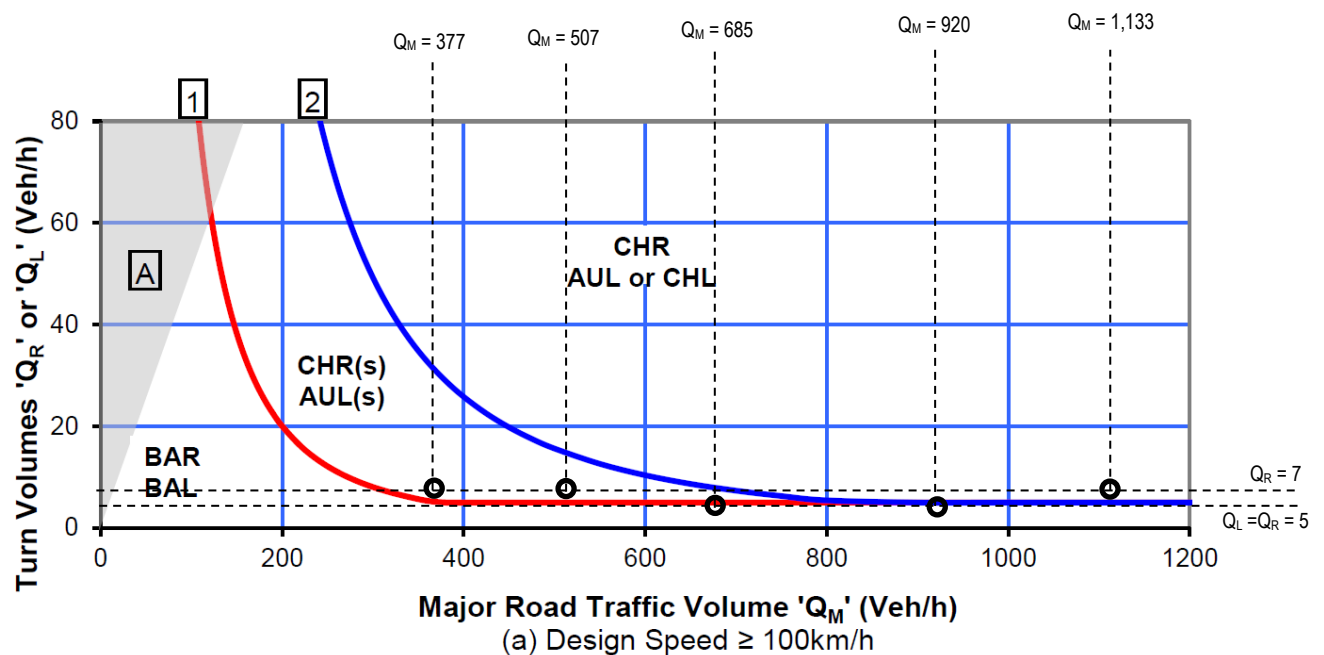
$$\begin{aligned} Q_{M-2020} &= 685 \\ Q_{M-2029} &= 920 \\ Q_L &= 5 \end{aligned}$$

AND

$$\begin{aligned} Q_{M-2020} &= 377 \\ Q_{M-2029} &= 507 \end{aligned}$$

$$Q_L = 7$$

Plotted on the turning warrants curves this data shows:



It can be seen from the Figure above that under some circumstances the traffic peak flows indicated would recommend a CHR(s) / AUL(s) to be provided at this intersection, while other scenarios would indicate BAR/BAL is sufficient. It is noted that the Q_R assessment for the 2029 extrapolation is not able to be plotted on these axes.

It is also noted that seasonal traffic flow would push these charts further to the right - generally suggesting the 'larger' intersection options are required.

Given the good sight distances available in the area it is recommended based on these warrants that a BAL style intersection be used for left turn treatments as the anticipated traffic flow into the development from a southern direction is very minor.

For right turn treatments however the existing traffic volumes require a higher intersection treatment. Due to the good sight distance available as well as the very low peak movements into the subdivision it is recommended that a CHR(s) treatment be applied to right turning movements.

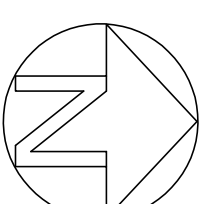
Conclusions

The proposed development will generate minor additional traffic movements to and from the site.

Generally, traffic numbers are relatively low compared to existing traffic (~12 peak hour movements two-way in the worst-case scenario) thus creating minimal impact on Jervis Bay Road with approx. 1 vehicle per 5 minutes of peak traffic flow.

It is recommended that a CHR(s)/BAL intersection be provided at the intersection with Jervis Bay Road to adequately address the Turning Warrants in accordance with Austroads Guide to Traffic Management Part 6 2019.

Appendix A Site Plan



D P 2 0 6 4 4 8
59

FOREST

WATERCOURSE

JERVIS
TO PRINCES HWY

D
P
8
4
6
4
7
0

FOREST

ZONE E2
FOREST

FOREST

2

COMMUNITY PROPERTY

15.62hc

-20

BAY

ROAD

200M

STATE

D
P
7
5
5
9
2
8

94

37

E1 EFFLUENT DISPOSAL AREA 480m²
E2 RESERVE AREA 470m²
MIN 3M FROM UPSLOPE BDY
MIN 6M FROM DOWNSLOPE BDY
A RIGHT OF CARRIAGEWAY 5 WIDE
A EASEMENT FOR SERVICES 5 WIDE

NOTES

1. LOT AREAS AND DIMENSIONS ARE SUBJECT TO FINAL SURVEY.

2. DETAIL OF AREA AROUND HOUSE AND DRIVEWAY ARE BY GROUND SURVEY. REMAINING DETAIL HAS BEEN SCALED FROM AERIAL PHOTOGRAPHY.

3. CONTOURS ARE INDICATIVE OF SURFACE TOPOGRAPHY ONLY

4. BACKGROUND IMAGE FROM SIX MAPS



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PROPOSED COMMUNITY TITLE SUBDIVISION

LOT 3 DP846470

JERVIS BAY ROAD, FALLS CREEK

FOR COMMAN STODDART

SURVEYOR		GB TD	1: 3000 A
DRAWN		SL	
DATE		13 DEC 2019	
DATUM		AHD APPROX	
ORIGIN		SIX TOPO MAP	
RL		REV	6