Attention : Andrew More

20th May 2021

Dear Andrew,

Proposed Industrial Subdivision
Lot 4 in DP 635505
150 Lismore Road, Bangalow
Traffic Engineering Assessment

I refer to your request for our assessment and report regarding a proposed industrial subdivision at the above location.

1. The Location of the Site

The location of the subject site is shown in attached Fig 1.

The site is located immediately adjacent to Lismore Road. However, all vehicle access is proposed to be via Dudgeons Lane which intersects with Lismore Road.

2. Road Classifications and Management

Lismore Road is a state controlled road managed by the NSW Department of Marine and Road Services.

Dudgeons Lane is a local road managed by Byron Shire Council.

3. The Proposed Subdivision

It is understood that development plans are only preliminary at this stage. However, TPS has made a traffic engineering assessment of the subdivision proposal based on the attached Lot Layout shown in Fig 2.

The "Indicative Lot Layout" plan shows the following potential Lot development and building gross floor areas (based on gfa = 50% of Lot area).

Lot No.	Usable Area (sq.m.)	Gross Floor Area (gfa)
1	1,000	500
2	1,000	500
3	1,116	500
4	1,000	500
5	1,000	500
6	1,000	500
7	1,000	500
Total	7,116	3,500

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4. Development Traffic Generation

Recent surveys conducted by RMS and reported in RMS Technical Direction 2013/04A describes the following traffic generation rates for industrial estates of the type expected to be developed on the subject land.

Business parks and industrial estates

In 2012 eleven of these two types of sites were surveyed, four within the Sydney urban area, four within the Lower Hunter, one in the Illawarra and one in Dubbo. Summary vehicle trip generation rates were as follows:

Weekday Rates	Sydney Average	Sydney Range	Regional Average	Regional Range
AM peak (1 hour) vehicle trips per 100 m^2 of GFA.	0.52	0.15-1.31	0.70	0.32-1.20
PM peak (1 hour) vehicle trips per 100 m^2 of GFA.	0.56	0.16-1.50	0.78	0.39-1.30
Daily total vehicle trips	4.60	1.89-10.47	7.83	3.78-11.99

The RMS survey findings confirm survey results from Queensland where generation rates for industrial developments were found to lie in the range of 5.0vpd/100sq.m.(gfa) to 10.0vpd/100sq.m.(gfa) depending on the location of the development and the nature of industrial activity being conducted.

Based on the RMS "Regional Average" survey findings reported in the above table, the proposed subdivision will generate the following approximate traffic movements when the development is complete.

Probable Traffic Generation (VPH In+Out)

	Vehs (in+out)
AM Peak Hour	25
PM Peak Hour	30
Daily	275

5 Existing Traffic Volumes

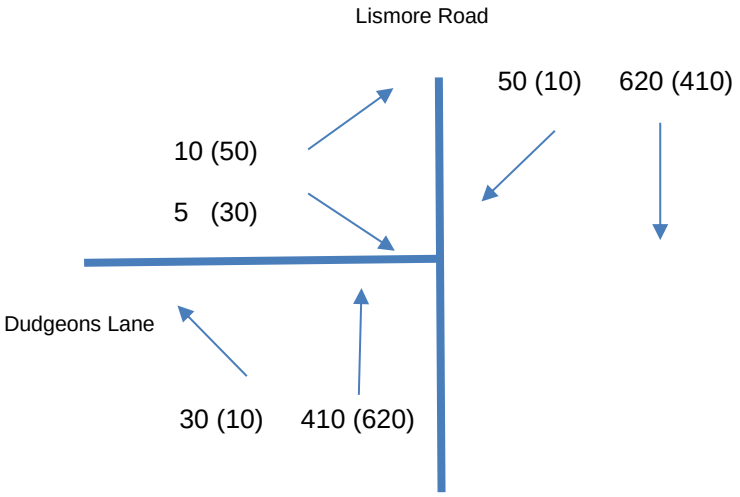
TPS does not have traffic survey data for the Lismore Road / Dudgeons Lane intersection. However, RMS published survey data indicates that Lismore Road carried approximately 6,600 vpd at the site in 2011. There is no more recent RMS data published for Lismore Road in proximity to the subject site.

Assuming a compound annual growth rate of 2% in the 10yr period 2011 to 2021, Lismore Road would currently be carrying approximately 8,100 vpd past the site. Assuming that a 2% compound rate continues for the next 12 years (10yrs following completion of the development), Lismore Road will carry approximately 10,300vpd past the site in 2033.

Aerial photography indicates that there is currently approximately 9,000 sq.m.(gfa) of industrial development in the existing industrial estate which is serviced via the Dudgeons Lane and Lismore Road intersection. Based on the RMS "Regional Average" rates shown in the Table in Section 4 above, the existing development generates approximately 700 vpd (in+out) and 70vph in peak hours via the Dudgeons Lane / Lismore Road intersection.

6. Estimated Future (2033) Traffic Volumes Following the Subject Development

Based on the estimates given in Sections 4 and 5 of this report we estimate that peak hour intersection volumes in 2033 following the subject development will be approximately as shown in the following diagram.



Estimated 2033 AM (PM) Peak Hour Traffic Volumes

7. Current Lismore Road / Dudgeon Lane Intersection Design

The existing intersection configuration is of considerable quality, consisting of a right turn lane, left turn lane and acceleration lane as shown below in aerial photography. All these lanes are approximately 160m in length, including tapers.

Whilst the posted speed zone in which the subject intersection is located is 80kph, the existing intersection design is consistent with a 100kph design speed (Ref :Table 5.2, AustRoads GRD Part 4A).

8. Estimated Future Intersection Capacity

Based on estimated future traffic volumes shown in Section 6, an assumed truck content of 7.5% (based on RMS data) and SIDRA 9.0 analysis, the intersection will operate with degrees of saturation and queue lengths in 2033 shown in the following SIDRA 9.1 outputs. That is, presuming that the subdivision is fully developed to the maximum potential indicated in Section 3 by 2033.

The most critical traffic movements (from a capacity and safety perspective) are the right turn movement out of Dudgeons Lane to Lismore Road and the right turn movement from Lismore Road to Dudgeons Lane in peak hours.

The SIDRA analyses for 2033 peak hours indicate that the intersection is capable of providing safely for the subject subdivision, even if subdivision generated traffic movements and movements in Lismore Road were to be substantially higher than those estimates shown in Section 6.

LANE SUMMARY

Site: 101 [Lismore / Dudgeon 2033 AM (Site Folder: General)]

2033 AM Peak
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Lismore													
Lane 1	30	7.5	1763	0.017	100	5.6	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	410	7.5	1859	0.221	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	440	7.5		0.221		0.4	NA	0.0	0.0				
North: Lismore													
Lane 1	620	7.5	1847	0.336	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	50	7.5	836	0.060	100	8.0	LOS A	0.2	1.7	Short	130	0.0	NA
Approach	670	7.5		0.336		0.7	NA	0.2	1.7				
West: Dudgeon													
Lane 1	10	7.5	687	0.015	100	11.0	LOS A	0.0	0.4	Short	20	0.0	NA
Lane 2	5	7.5	126	0.040	100	35.6	LOS C	0.1	0.9	Full	500	0.0	0.0
Approach	15	7.5		0.040		19.2	LOS B	0.1	0.9				
Intersection	1125	7.5		0.336		0.9	NA	0.2	1.7				

LANE SUMMARY

Site: 101 [Lismore / Dudgeon 2033 PM (Site Folder: General)]

2033 PM Peak
Site Category: (None)
Stop (Two-Way)

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] m	Lane Config	Lane Length m	Cap. Adj. %	Prob. Block. %
South: Lismore													
Lane 1	10	7.5	1763	0.006	100	5.6	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	620	7.5	1859	0.333	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Approach	630	7.5		0.333		0.2	NA	0.0	0.0				
North: Lismore													
Lane 1	410	7.5	1859	0.221	100	0.1	LOS A	0.0	0.0	Full	500	0.0	0.0
Lane 2	10	7.5	621	0.016	100	9.6	LOS A	0.1	0.4	Short	130	0.0	NA
Approach	420	7.5		0.221		0.4	NA	0.1	0.4				
West: Dudgeon													
Lane 1	50	7.5	477	0.105	100	14.0	LOS A	0.4	2.6	Short	20	0.0	NA
Lane 2	30	7.5	139	0.216	100	36.1	LOS C	0.7	5.3	Full	500	0.0	0.0
Approach	80	7.5		0.216		22.3	LOS B	0.7	5.3				
Intersection	1130	7.5		0.333		1.8	NA	0.7	5.3				

9. Effect of the Pacific Motorway Upgrade

TPS is not aware of any circumstances or traffic volume changes arising from the most recent upgrade of the Pacific Highway which might have affected the subject site accessibility to any significant degree.

Even if the upgrade works were to have resulted in 2033 traffic volumes in Lismore Road being greater than the estimates shown in Section 6, the SIDRA analyses shown in Section 8 of this report indicate that any increases would have had to have been substantial before any significant effect on site accessibility would have occurred. This is not apparent.

10. Subdivision Access On Dudgeons Lane

The proposed location of the subdivision access on the back of a horizontal curve in Dudgeons Lane will ensure that adequate sight distances will be available to and from both directions along Dudgeons Lane.

The function of Dudgeons Lane and future traffic volume expectations for Dudgeons Lane will be such as to only require a T-intersection access arrangement with priorities to Dudgeons Lane approaches, without the need for auxiliary turn lanes.

11. Conclusions

Based on the investigations and traffic estimates etc. described in this report we are of the opinion that the proposed subdivision should be approved with respect to traffic engineering matters, provided that final Lot configurations allow road widths and Lot access arrangements within the subdivision to satisfy Council standards for industrial development.

If you have any questions, please call me on 0419 722451 or email me at gholdsworth@trafficparking.com.au .

`Yours sincerely,

Glen R Holdsworth
RPEQ 4152
B. Eng.(Civil), M.Eng.Sc.(Highway Eng.)
RPEQ, MITE, MIEAust, MPA
Ref : TPS241Rep3

Fig 1 The Subject Site

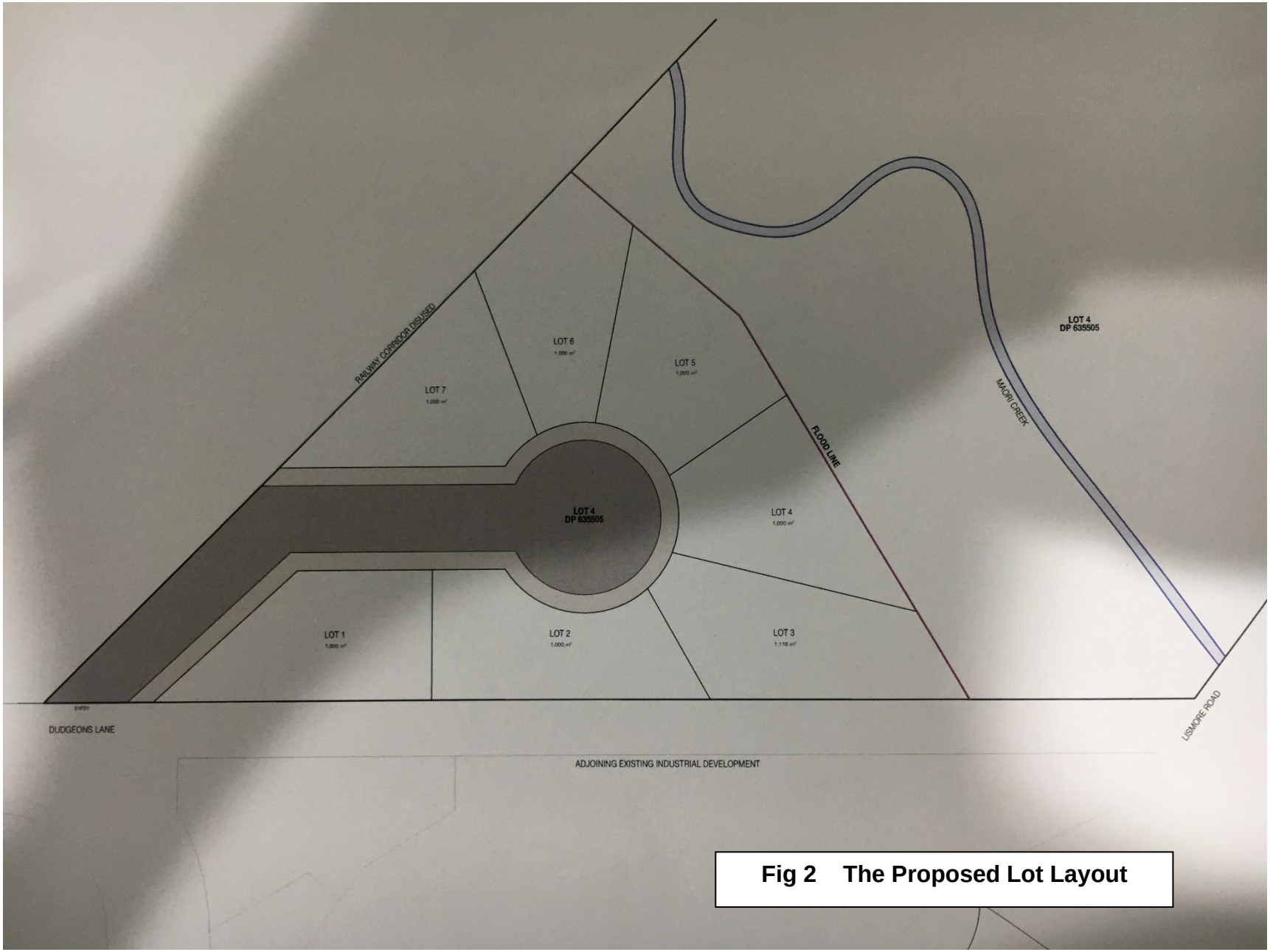


Fig 2 The Proposed Lot Layout