Ref: 19/051

13th May 2019

Hunter Land Pty Ltd
PO Box 3042
THORNTON NSW 2322

Attention: - Tanya Gurieff

Dear Tanya,

RE: Freeway North Industrial Estate modification – Intersection Analysis Canavan Drive.

Reference is made to the request by Newcastle City Council (NCC) dated 7 March 2019 and NSW Roads and Maritime Services (NSW RMS) dated 1st April 2019 for supplementary traffic advice in regard to the anticipated traffic generation from the development and intersection control adequacy for the proposed new single intersection with Canavan Drive resulting from this modification. Intersect Traffic has undertaken this intersection analysis and provides the following advice.

In undertaking this analysis Intersect Traffic has made the following assumptions based on the proposed plan for the Freeway North Industrial area and information contained within the NSW RMS' Technical Direction TDT 13/04.

- The development catchment serviced by the two new cul-de-sacs is approximately 150,000 m^2 (measured from Near Map aerial).
- The development catchment on Canavan Drive beyond the new intersection is 125,000 m^2 (measured from Near Map aerial).
- During the AM peak 70 % of traffic is inbound while in the PM peak 70 % of traffic is outbound.
- Whilst a small number of lots gain access directly to Canavan Drive or to the new cul-de-sac roads and Canavan Drive it is assumed as a worst-case scenario assessment that all lots access the new cul-de-sac roads.
- At Canavan Drive all traffic generated by the lots accessed from the cul-de-sacs will have an origin / destination to / from Weakley's Drive.
- Previous traffic reports have assessed the GLFA for various Hunter Land Business Parks which determined a site coverage ratio between 25-27%. For the purposes of this report, a conservative site coverage ratio of 35% has been utilised which represents a worst-case scenario assessment.
- Traffic anticipated to be generated by the development has been calculated as per the rates within the recorded surveys in the Appendices of TDT13/04 for the existing Freeway Business Park, Beresfield. i.e. 0.564 vtph per 100 m^2 GFA in the AM peak and 0.403 vtph per 100 m^2 GFA in the PM peak. It should be noted that the traffic generation is based on building GFA values and not the number of lots. The building GFA is then estimated based on the

overall land area. Therefore traffic generation from the site is not dependant on the number of lots but is on the size of the land parcel. If the land parcel size remains the same so does the traffic generation from the site independent of how many lots are provided.

Therefore the trip distribution at the intersection adopted for this assessment is as shown in ***Figure 1*** below. Note an internal trip assumption of 10 % has been adopted for left out and right turn in movements at the intersection.

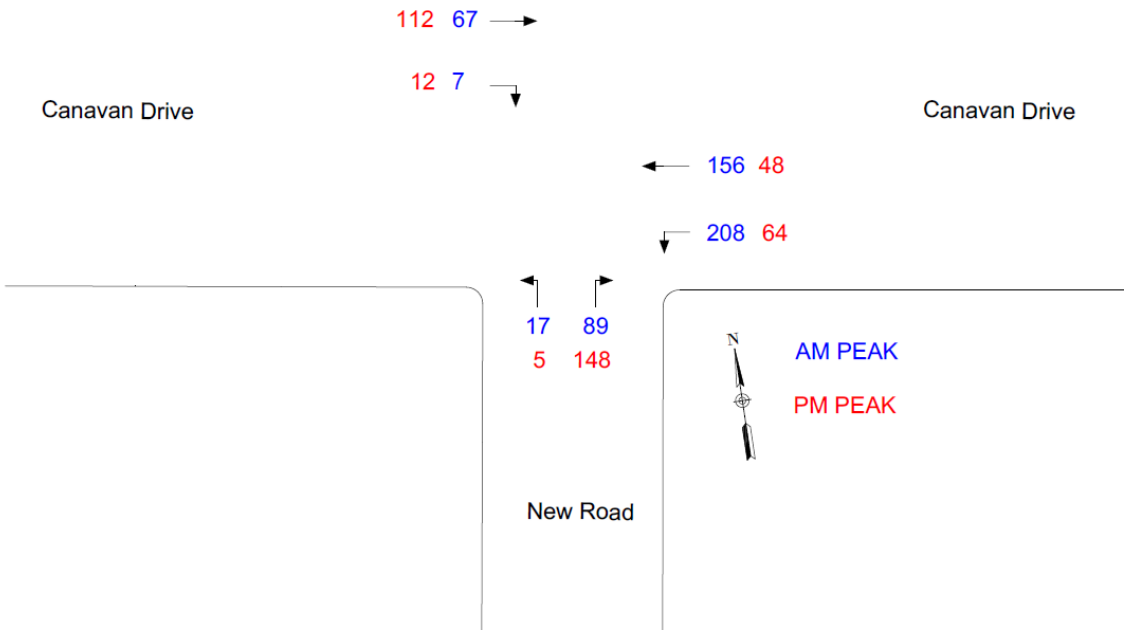

Figure 1 – Trip Distribution – New Intersection

This intersection was then analysed using the SIDRA INTERSECTION 8 intersection modelling software for the post full development scenario. Assumptions made in the modelling were;

- Intersection to be constructed as an urban BAR / BAL (no turning lanes) with give way priority control, Canavan Drive having priority.
- Trip distribution as per ***Figure 1*** representing full development and no further traffic growth; and
- Percentage of heavy vehicles 15 % as an industrial business park.

The SIDRA INTERSECTION 8 modelling software package predicts likely delays, queue lengths and thus levels of service that will occur at intersections. Assessment is then based on the level of service requirements of the RMS shown below in Table 4.2 below extracted from the RTA's Guide to Traffic Generating Developments (2002).

The results of the Sidra Intersection Modelling are summarised below in ***Table 1*** while the Sidra Movement Summary Tables are provided in ***Attachment 1***.

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 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

Source: - RTA's Guide to Traffic Generating Developments (2002).

Table 1 – Canavan Drive / New Road Give Way priority-controlled intersection – Sidra Results Summary

Model	Deg. Satn (v/c)	Average Delay (s)	Worst Level of Service	95 % back of queue length (cars)
AM full development	0.223	3.2	A	0.4
PM full development	0.165	3.2	A	0.6

This modelling shows that the Canavan Drive / New Subdivision T-intersection with give way priority control would operate satisfactorily (acceptable LoS) post full development with average delays and back of queue lengths well within the acceptable criteria set by NSW RMS. With a maximum degree of saturation of 0.223 it is shown that on full development the intersection is operating below 25 % capacity.

Therefore it is reasonable to conclude that the proposed modified subdivision layout for the Freeway North Business Park with two separate cul-de-sac roads connecting to a single give way priority controlled intersection to Canavan Drive can be supported as the proposal will not result in unsatisfactory operation of the local road network as the single intersection connection to Canavan Drive will operate satisfactorily as a give way priority controlled intersection.

For further information or clarification please do not hesitate to contact me on 02 4936 6200 or 0423 324 188.

Yours sincerely

Jeff Garry

Director
Intersect Traffic

M: 0423 324 188 **E: jeff@intersecttraffic.com.au** **P: 02 4933 2870**
PO BOX 268 EAST MAITLAND NSW 2323

Attachment 1

MOVEMENT SUMMARY

▽ Site: 101 [AM peak Full Development]

Canavan Drive / New road give way
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: New subdivision Road												
1	L2	18	15.0	0.128	5.4	LOS A	0.4	3.5	0.38	0.64	0.38	40.0
3	R2	94	15.0	0.128	6.6	LOS A	0.4	3.5	0.38	0.64	0.38	39.2
Approach		112	15.0	0.128	6.4	LOS A	0.4	3.5	0.38	0.64	0.38	39.3
East: Canavan Drive												
4	L2	219	15.0	0.223	4.7	LOS A	0.0	0.0	0.00	0.30	0.00	44.5
5	T1	164	15.0	0.223	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	45.9
Approach		383	15.0	0.223	2.7	NA	0.0	0.0	0.00	0.30	0.00	45.1
West: Canavan Drive												
11	T1	71	15.0	0.047	0.3	LOS A	0.1	0.6	0.11	0.06	0.11	48.5
12	R2	7	15.0	0.047	6.5	LOS A	0.1	0.6	0.11	0.06	0.11	45.7
Approach		78	15.0	0.047	0.9	NA	0.1	0.6	0.11	0.06	0.11	48.2
All Vehicles		573	15.0	0.223	3.2	NA	0.4	3.5	0.09	0.34	0.09	44.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
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 movements.
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.

MOVEMENT SUMMARY

▽ Site: 101 [PM peak Full Development]

Canavan Drive / New road give way
Site Category: (None)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flows Total veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: New subdivision Road												
1	L2	5	15.0	0.165	4.9	LOS A	0.6	4.6	0.30	0.60	0.30	40.7
3	R2	156	15.0	0.165	5.8	LOS A	0.6	4.6	0.30	0.60	0.30	39.9
Approach		161	15.0	0.165	5.8	LOS A	0.6	4.6	0.30	0.60	0.30	39.9
East: Canavan Drive												
4	L2	67	15.0	0.069	4.7	LOS A	0.0	0.0	0.00	0.31	0.00	44.5
5	T1	51	15.0	0.069	0.0	LOS A	0.0	0.0	0.00	0.31	0.00	46.0
Approach		118	15.0	0.069	2.7	NA	0.0	0.0	0.00	0.31	0.00	45.1
West: Canavan Drive												
11	T1	118	15.0	0.075	0.1	LOS A	0.1	0.7	0.06	0.05	0.06	48.9
12	R2	13	15.0	0.075	5.2	LOS A	0.1	0.7	0.06	0.05	0.06	46.0
Approach		131	15.0	0.075	0.6	NA	0.1	0.7	0.06	0.05	0.06	48.6
All Vehicles		409	15.0	0.165	3.2	NA	0.6	4.6	0.14	0.34	0.14	43.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
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 movements.
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.