Northern Gateway Landowners

Transport Hub

Emerton Cl, Cundletown

TRAFFIC IMPACT Assessment

Prepared by

Northern Transport Planning and Engineering Pty Ltd

A.B.N. 79 056 088 629

December, 2019 *192940*

Table of Contents

Contents

1. INTRODUCTION

NTPE has been commissioned to provide a traffic impact assessment for the Northern Gateway Transport Precinct located on the northern edge of Cundletown.

The Northern Gateway is being developed in two Stages with a total area of 74ha. Stage 1 (7ha) is adjacent to the Pacific Highway at Emerton Close, which has been has been rezoned and a development application approved to establish a transport/trucking depot. Stage 2 (67ha) seeks to extend the land available for transport related industries toward the airport.

Stage 2 of the development will include the development of a bypass of Cundletown following a route similar to that shown in Figure 2-1 below.

The western connection of the Bypass to Main St (Pacific Hwy) at or near Albert St is outside the scope of this report.

2. SITE LAYOUT AND ACCESS

Plans are currently being prepared for a Roundabout to be constructed at the intersection of Emerton Close/Princes St to provide access to the approved Stage 1 development.

This roundabout will also include a connection to the proposed Cundletown Bypass, which will skirt around the northern edge of the established Cundletown residential areas as shown in Figure 2-1 below:

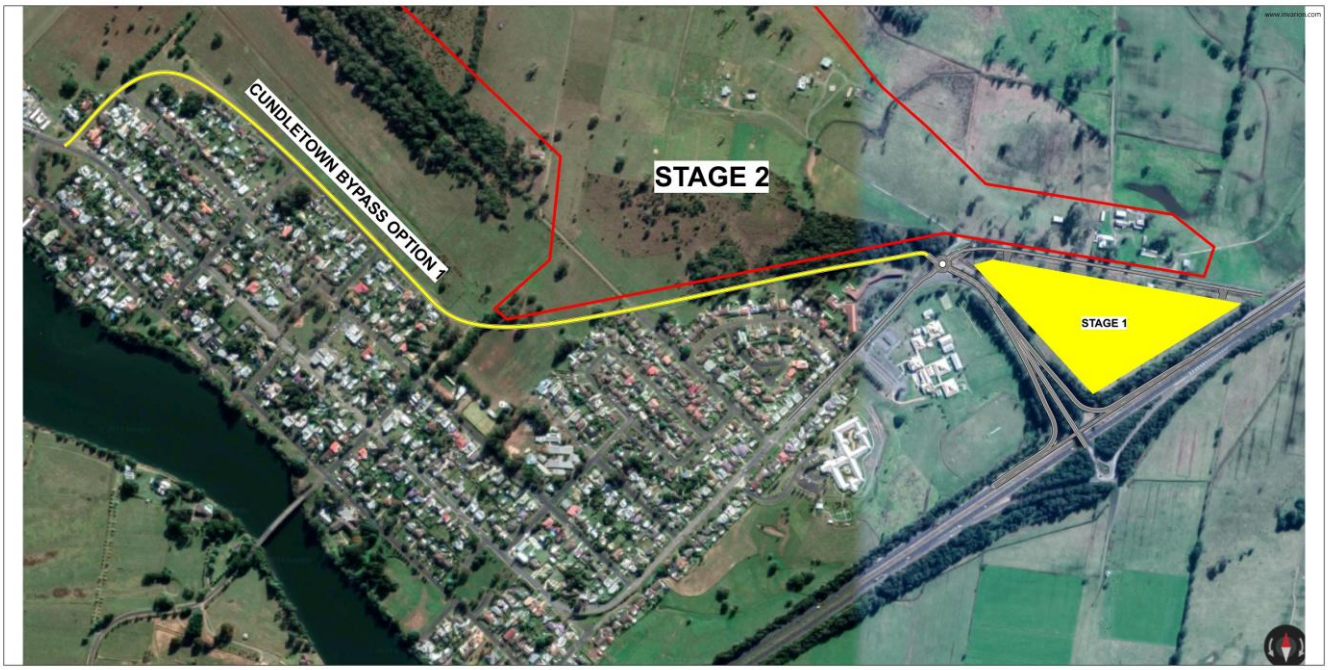


Figure 2-1: Northern Gateway Transport Precinct Access and Cundletown Bypass Option 1

Discussion

The alignment of the Cundletown Bypass is constrained by the existing residential development areas and the Taree Airport, in particular the east / west airstrip as shown in Figure 2-1.

An alternative alignment for the Cundletown Bypass is shown below in Figure 2-2.

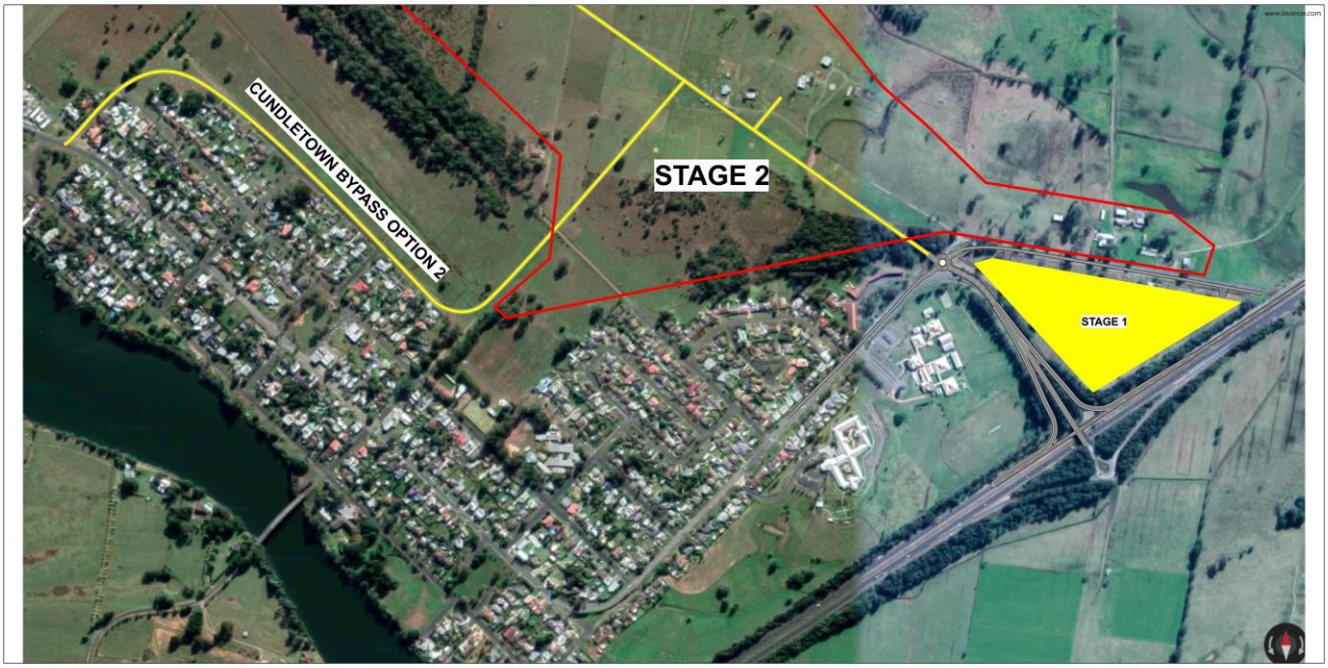


Figure 2-2: Northern Gateway Transport Precinct Access and Cundletown Bypass Option 2

It is considered that the Option 2 Route for the Bypass will increase an opportunity for the by-pass to provide access to several lots within the Transport Precinct.

The lots to be established within the Precinct will be limited to a minimum size of 2ha in order to ensure the establishment of suitable transport oriented industries rather than smaller light industrial uses.

3. EXISTING TRAFFIC

3.1 Automatic Count Data

Automatic vehicle classification counts were carried out on each of the on-off ramps leading to the Pacific Highway from the 21st March 2019 to the 27th March 2019.

A summary of Average Peak Hour traffic flows recorded during these surveys is presented in Table 4-1 below:

Table 3-1: Princes Street/Pacific Hwy Interchange - Average Peak Hour Traffic Flows

Average Weekday Traffic Flows	AM Peak 8am-9am	PM Peak 3pm - 4pm	Daily
Northbound off-ramp	187	84	926
Northbound on-ramp	144	283	2729
Southbound off-ramp	381	202	2831
Southbound on-ramp	60	96	887

A full report on the automatic counts carried out is attached as Appendix A.

3.2 Intersection Counts

Princes St / Emerton Close

Vehicle turning movements observed at the intersection of Princes St and Emerton Close during the AM and PM Peak Hour are detailed in Figures 3-1 and 3-2 below:

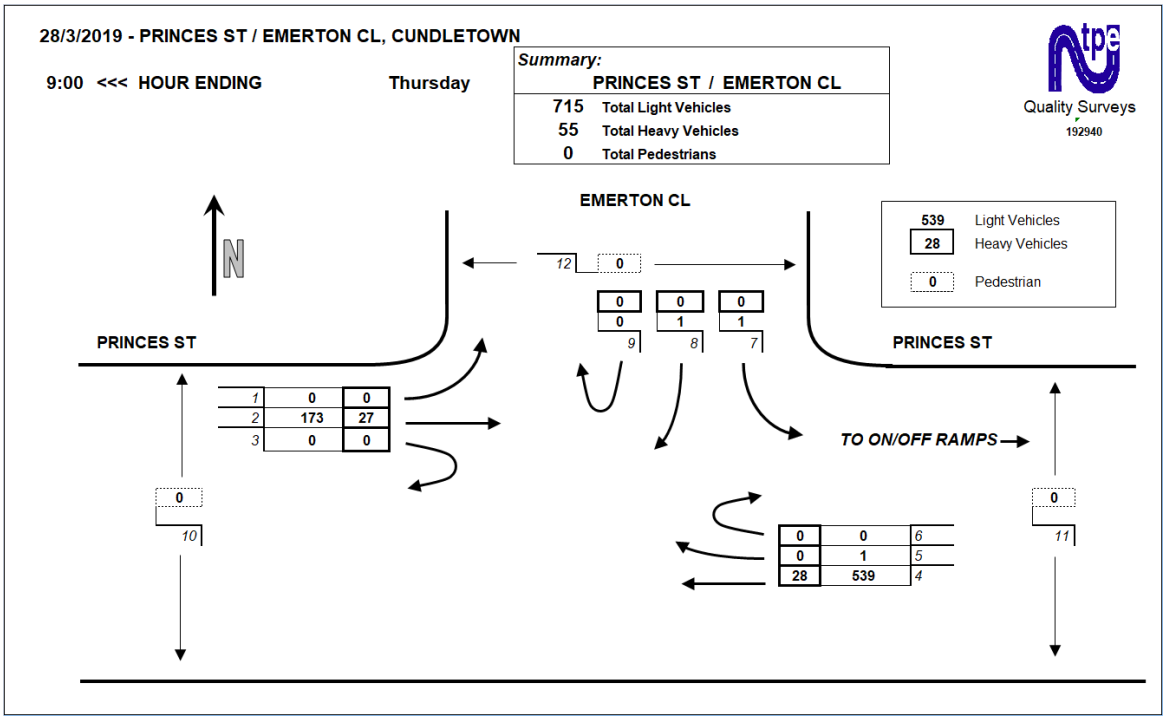


Figure 3-1: Intersection Princess Street / Emerton Close AM Peak Hour Ending 9:00

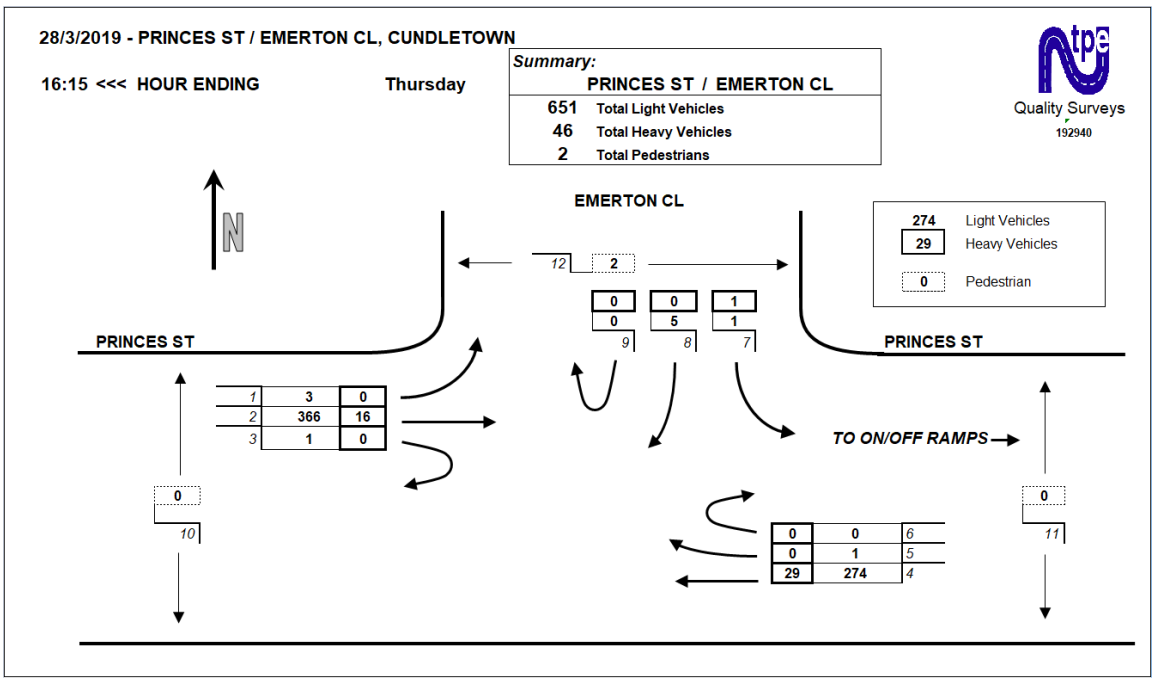


Figure 3-2: Intersection Princess Street / Emerton Close PM Peak Hour Ending 16:15

Discussion

These survey results show that there is virtually no activity in Emerton Close during either the AM or PM Peak Hour.

Princes St / Pacific Hwy

Vehicle turning movements observed at the intersection of Princes St and Pacific Hwy during the AM and PM Peak Hour are detailed in Figures 3-3 and 3-3 below:

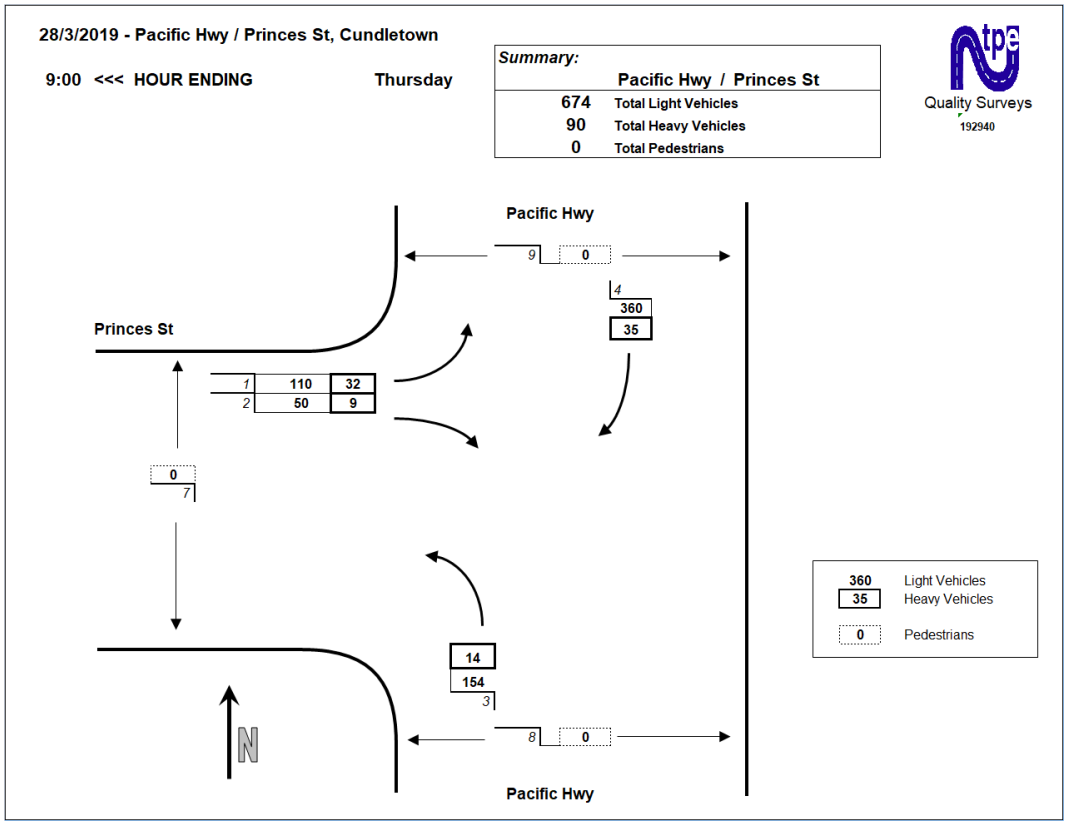


Figure 3-3: Intersection Princess Street / Pacific Hwye AM Peak Hour Ending 9:00

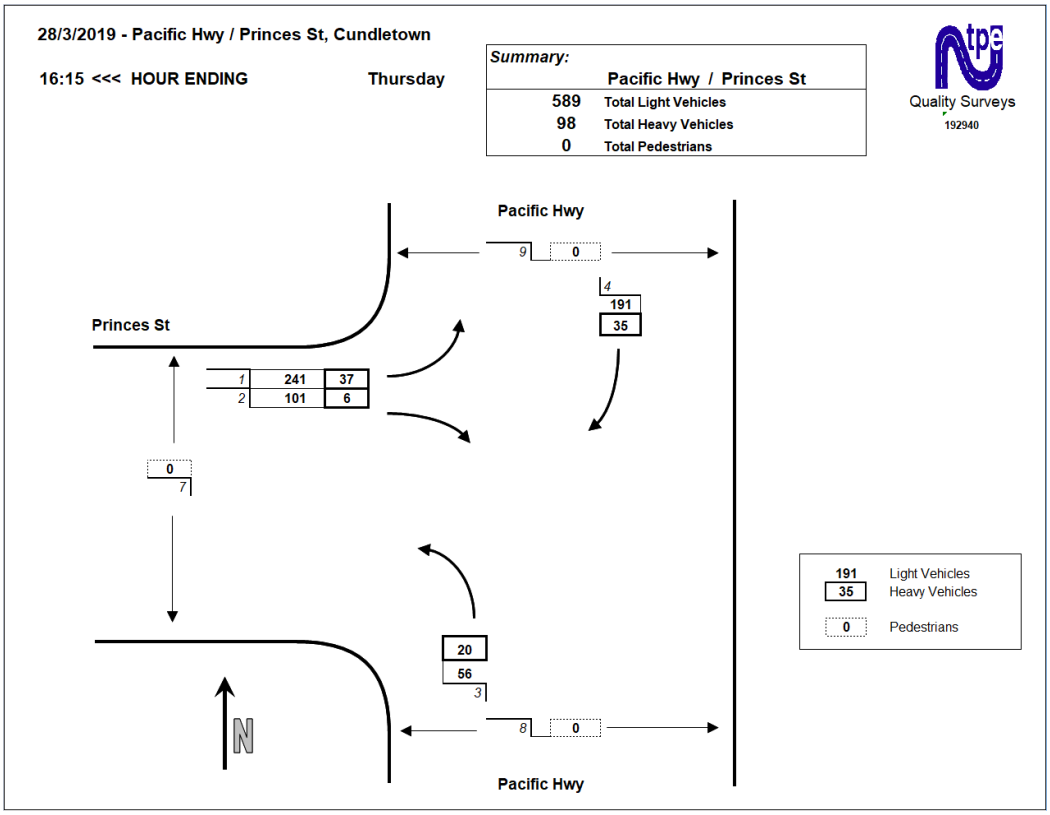


Figure 3-2: Intersection Princess Street / Pacific Hwy PM Peak Hour Ending 16:15

4. PREDICTED TRAFFIC FLOWS – STAGE 1

Below is an extract from the 2015 Traffic Impact Assessment for Stage 1 detailing the predicted 2029 traffic flows for Stage 1.

As detailed above the existing truck depot at Taree is generating very low traffic flows during the AM and PM Peak Hour periods.

The proposed relocation of the operations to the Cundletown site will not see any change to this trip activity.

The predicted traffic flows at the intersection of Emerton Close and Princess Street after the relocation as presented below in Figure 4-1 and 4-2:

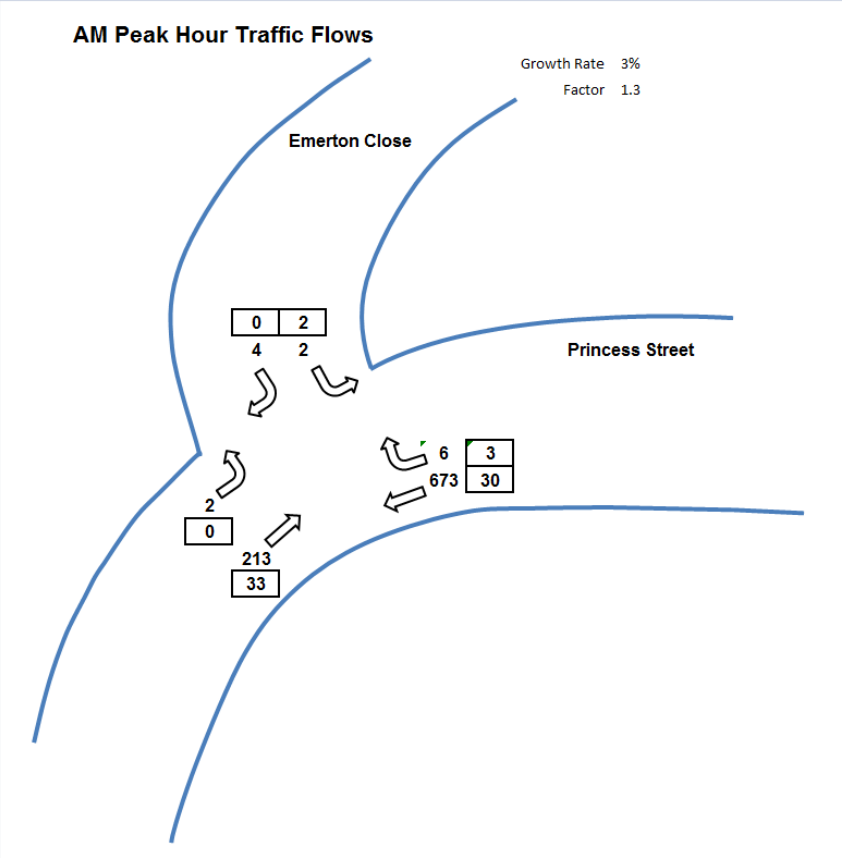


Figure 4-1: Predicted AM Peak Hour (8pm – 9pm) Trips – Emerton Close/Princess Street

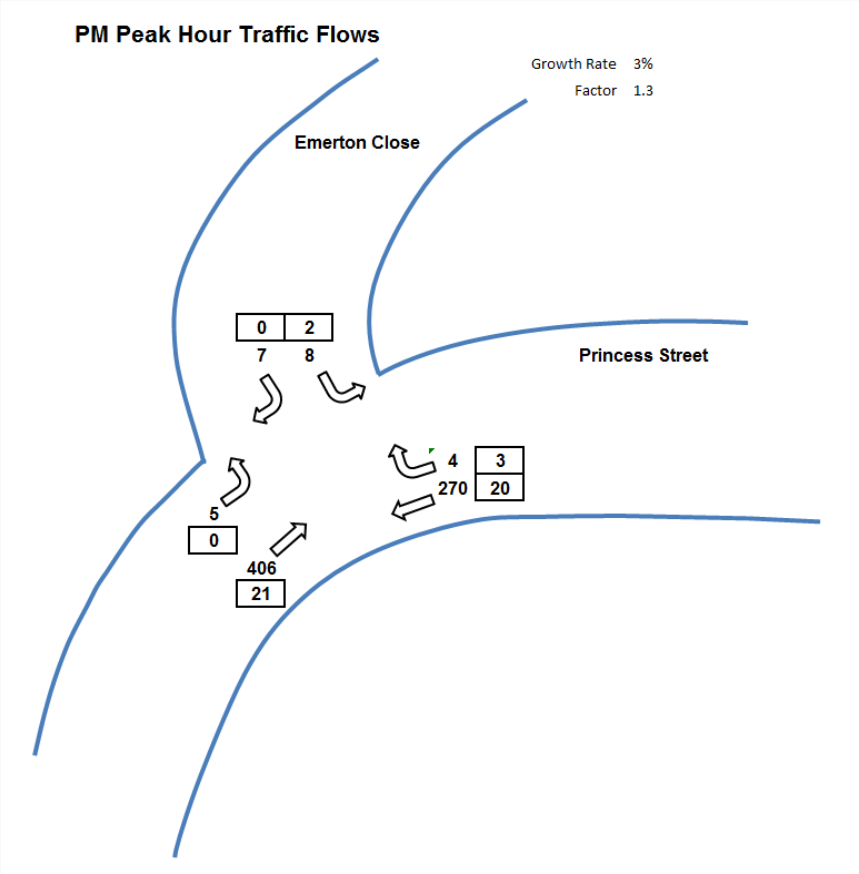


Figure 4-2: Predicted PM Peak Hour (3.30pm – 4.30pm) Trips – Emerton Close/Princess Street

5. TRIP GENERATION – STAGE 1 AND STAGE 2 OF TRANSPORT HUB

The actual land use activity to be accommodated within Stage 2 of the Transport Precinct has not been established. Therefore in order to estimate the number of trips to be accommodated it is proposed that the following alternative options for deriving these trips be considered.

Option A	Use Stage 1 Trip Rates to derive Stage 2 Trips
Option B	Use RMS Trip Rates for a normal Business Park

Land Use Option A

The Traffic Impact Assessment Report prepared by NTPE in 2015 for the approved 7ha Stage 1 development established that the activity predicted to be Peak Hour Trips generated would be in the order of 19 and 29 in the AM and PM Peak Hour respectively with 5 of these trips being heavy vehicles. The 2015 Report also predicted that most of the heavy vehicle movements generated by the Stage 1 Development would occur outside the peak hour with a daily total of 160 heavy vehicles.

Accordingly it would be reasonable to estimate that the 67ha Stage 2 development would generate 182 and 278 trips in the AM and PM Peak Hour respectively with 48 of these being heavy vehicles.

Land Use Option B

Alternatively, if the Stage 2 development were to be assessed as a typical Business Park using the following RMS approved trip rates (Re: RMS Letter Dated attached as Appendix B):

AM Peak Hour	0.6 trips per $100m^2$ GLFA.
PM Peak Hour	0.7 trips per $100m^2$ GLFA.

The land area available for the Transport precinct is subject to several environmental constraints such as flooding and habitat. It is therefore expected that less than half of the 67ha will actually be available for development.

The predicted trip generation for the Stage 2 development of the Transport Precinct based on development of 34ha is detailed in Table 5-1 below:

Table 5-1: Stage 2 Trip Generation based in RMS Business Park Trip Rates Option 2

Stage 2	Site Area (m2)	% Area Used*	Equivalent Active Land Area (100m2)	Peak Hr Trip Rate (Trips/100m2) AM	Peak Hr Trip Rate (Trips/100m2) PM	Total Peak Hr Trips AM	Total Peak Hr Trips PM
Transport Precinct	335,000 m2	0.35	1173	0.6	0.7	704	821

Note: * The agreed trip rates are based on observed net active area of lots within a Business Park which is 35%.

Re: Maunsell Report on Hunter Valley Business Park Trip Rates 2007 attached as Appendix C

Discussion

The Trip Rates used in this assessment are based on research that was carried out initially by NTPE and then formalised in a report prepared by Maunsell / AECOM in January 2007 (see Executive Summary of the Maunsell Report attached as Appendix C)

It is acknowledged that the RMS subsequently published Technical Direction TDT 2013/ 04a in August 2013 which includes recommended trip rates for Business Parks as presented in Figure 5-1 below:

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

Figure 5-1: RMS TDT 2013/04a Business parks and industrial estates - Trip Rates

As noted in the above extract from TDT included in Figure 5-1 these trip rates were derived from research carried out at four sites in the Lower Hunter. It is understood that the source of the data for the four Lower Hunter sites was in fact the Maunsell / AECOM Report prepared in 2007 and presented in Table E1 of the Executive Summary attached as Appendix C.

While, the AM peak hour trip rate of 0.6 trips /100m^2 used in the report submitted in July 2019 is lower than the Regional Average of 0.70 trips /100m^2 it is considered that it is well within the Regional Range of between 0.32 and 1.20 and is therefore appropriate for this assessment. However, for the purpose this revised assessment the trip rate of 0.70 trips /100m^2 has been used for the AM Peak Hour.

Also while, the PM peak hour trip rate of 0.7 trips /100m^2 is lower than the Regional Average of 0.78 trips /100m^2 it is considered that it is well within the Regional Range of between 0.39 and 1.30 and is therefore appropriate for this assessment. However, for the purpose this revised assessment the trip rate of 0.78 trips /100m^2 has been used for the PM Peak Hour.

The Maunsell / AECOM Report also details the supporting evidence for calculating the Gross Leasable Floor Area used to derive the trip rates for the four Lower Hunter Business Parks as detailed in Figure 5-2 below:

Table E.2: GLFA Ratios

Site	GLFA m^2/ employee	GLFA m^2/ site area
RTA Sydney Surveys[a]	81[b]	0.64
Thornton Industrial Estate	92	0.28
Racecourse Business Park	212	0.30
Freeway Business Park	136	0.39
Holmwood Business Park	n/a [c]	0.32

Source: Maunsell 2006

[a] Land Use Traffic Generation Data and Analysis 27: Business Parks, RTA, 1994

[b] Number of employees is an approximation based on the person trip rate at the RTA Sydney sites that were surveyed in support of the RTA trip rate.

[c] Employee data not available for Holmwood Business Park

Figure 5-2: Maunsell / AECOM - GLFA Ratios used to Derive Trip Rates

As shown in Figure 5-2 the GLFA ratios at the Hunter Valley Sites are significantly lower than the ratios recorded for the sites surveyed in Sydney. The average for the four Hunter Valley sites is 32%. It is therefore considered that the ratio of 35% used in this assessment is reasonable.

6. PREDICTED TRIP DISTRIBUTION AND ASSIGNMENT

Background traffic flows have been adjusted to allow for 3% annual linear growth over 10 years to predict the 2029 traffic volumes. These background traffic flows have been added to the predicted trips generated by both Stage 1 and Stage 2 of the proposed Northern Gateway Transport Precinct.

The predicted AM and PM Peak Hour 2029 traffic flows are detailed in Figures 6-1 and 6-2 below:

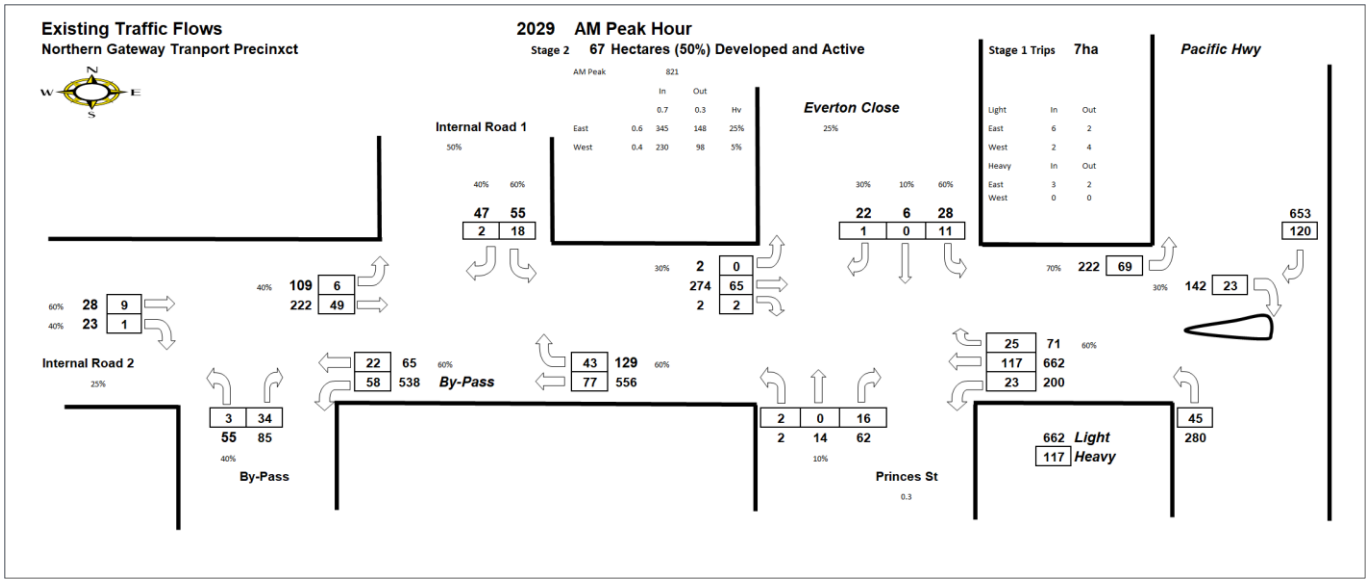


Figure 6-1: Predicted Traffic Flows - AM Peak 2029

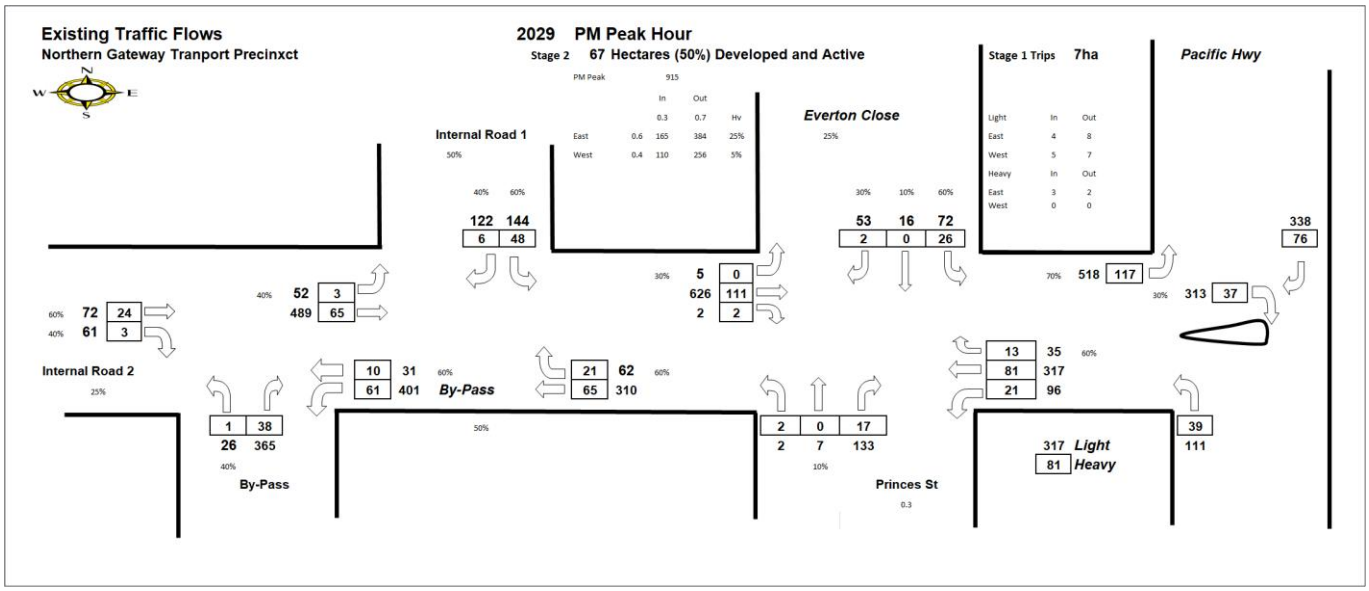


Figure 6-2: Predicted Traffic Flows - PM Peak 2029

7. SIDRA ANALYSIS – STAGE 1 AND 2 OF TRANSPORT HUB

The impact of the predicted traffic flows generated by the proposed Transport Hub has been assessed using the Intersection Analysis tool SIDRA. Level of Service at an intersection is based on the average delay per vehicle and can be applied to both an individual movement and the entire intersection. The concept is the same for both signalised and un-signalised intersections. Levels of service are ranked for A to F as summarised below in Table 6-1.

Table 7-1: Intersection Level of Service Performance Categories

	Control Delay per Vehicle	
Level of Service	**All Intersection Types**	**Description**
A	d <= 14.5	Excellent
B	14.5 < d <= 28.5	Very Good
C	28.5 < d <= 42.5	Good
D	42.5 < d <= 56.5	Acceptable
E	56.5 < d <= 70.5	Poor
F	70.5 < d	Very Poor

The predicted traffic flows for Stage 1 and Stage 2 of the proposed Transport Precinct have been assessed based on an upgrade of the intersection of Emerton Close / Princes St to provide a 2 lane roundabout.

The intersection simulation used in the SIDRA Analysis is presented in Figure 6-1:

Figure 7-1: SIDRA Simulation Intersection Layout - Prince St / Emerton Close

The results of the SIDRA Analysis for Stage 1 and 2 for year 2029 are presented in Table 7-2 below:

Table 7-2: SIDRA Results Stage 1 and 2 - Emerton Close / Princess Street

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: Prince St Sth												
1	L2	4	50.0	0.014	16.3	LOS B	0.1	0.6	0.73	0.75	0.73	45.9
3a	R1	15	0.0	0.160	14.3	LOS A	1.0	7.7	0.80	0.86	0.80	48.2
3	R2	82	20.5	0.160	16.3	LOS B	1.0	7.7	0.80	0.86	0.80	48.0
Approach		101	18.8	0.160	16.0	LOS B	1.0	7.7	0.79	0.85	0.79	47.9
East: Prince St (East)												
4	L2	235	10.3	0.131	3.6	LOS A	0.0	0.0	0.00	0.45	0.00	56.0
5	T1	820	15.0	0.612	4.5	LOS A	5.5	44.1	0.24	0.43	0.24	55.2
6b	R3	101	26.0	0.612	10.4	LOS A	5.5	44.1	0.24	0.43	0.24	54.9
Approach		1156	15.0	0.612	4.9	LOS A	5.5	44.1	0.19	0.43	0.19	55.3
NorthEast: Emerton Close												
24b	L3	41	28.2	0.044	6.0	LOS A	0.2	1.5	0.44	0.62	0.44	52.4
24a	L1	6	0.0	0.033	5.2	LOS A	0.1	0.9	0.44	0.65	0.44	52.9
26a	R1	24	4.3	0.033	9.3	LOS A	0.1	0.9	0.44	0.65	0.44	52.7
Approach		72	17.6	0.044	7.1	LOS A	0.2	1.5	0.44	0.64	0.44	52.6
West: Cundletown By-Pass												
10a	L1	2	0.0	0.168	4.5	LOS A	0.8	6.5	0.37	0.49	0.37	54.8
11	T1	357	19.2	0.168	5.3	LOS A	0.8	6.5	0.37	0.50	0.37	54.8
12	R2	4	50.0	0.168	10.6	LOS A	0.8	6.5	0.37	0.50	0.37	53.1
Approach		363	19.4	0.168	5.3	LOS A	0.8	6.5	0.37	0.50	0.37	54.7
All Vehicles		1692	16.3	0.612	5.7	LOS A	5.5	44.1	0.27	0.48	0.27	54.5

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: Prince St Sth												
1	L2	4	50.0	0.010	10.0	LOS A	0.0	0.4	0.58	0.64	0.58	49.8
3a	R1	6	0.0	0.177	10.2	LOS A	0.9	7.0	0.58	0.75	0.58	51.1
3	R2	158	11.3	0.177	11.6	LOS A	0.9	7.0	0.58	0.75	0.58	51.1
Approach		168	11.9	0.177	11.5	LOS A	0.9	7.0	0.58	0.75	0.58	51.1
East: Prince St (East)												
4	L2	123	17.9	0.072	3.7	LOS A	0.0	0.0	0.00	0.45	0.00	55.7
5	T1	419	20.4	0.356	4.7	LOS A	2.2	18.2	0.27	0.45	0.27	54.8
6b	R3	51	27.1	0.356	10.6	LOS A	2.2	18.2	0.27	0.45	0.27	54.7
Approach		593	20.4	0.356	5.0	LOS A	2.2	18.2	0.22	0.45	0.22	55.0
NorthEast: Emerton Close												
24b	L3	103	26.5	0.140	7.1	LOS A	0.6	5.0	0.62	0.80	0.62	52.0
24a	L1	17	0.0	0.086	6.1	LOS A	0.4	2.6	0.60	0.77	0.60	52.5
26a	R1	58	3.6	0.086	10.2	LOS A	0.4	2.6	0.60	0.77	0.60	52.2
Approach		178	16.6	0.140	8.0	LOS A	0.6	5.0	0.61	0.78	0.61	52.1
West: Cundletown By-Pass												
10a	L1	5	0.0	0.354	4.7	LOS A	2.0	16.1	0.44	0.52	0.44	54.4
11	T1	776	15.1	0.354	5.5	LOS A	2.0	16.1	0.45	0.53	0.45	54.5
12	R2	4	50.0	0.354	11.0	LOS A	2.0	15.9	0.45	0.53	0.45	52.8
Approach		785	15.1	0.354	5.5	LOS A	2.0	16.1	0.45	0.53	0.45	54.5
All Vehicles		1724	16.8	0.356	6.2	LOS A	2.2	18.2	0.40	0.55	0.40	54.1

Discussion

The SIDRA results presented in Table 7-2 indicate that the intersection of Emerton Close / Princess Street will perform well at Level Of Service B or better during both the AM and PM Peak Hour with the proposed Transport Hub fully commissioned.

8. PACIFIC HIGHWAY INTERCHANGE.

A previous study submitted to Council raised questions about the adequacy of the Pacific Highway Interchange to accommodate truck movements.

Pacific Highway Interchange at Cundletown was opened to traffic on Sunday 14th December 1997 as part of the Taree Bypass.

The works as executed plans show that the Interchange ramps were constructed as shown in Figure 8-1 below:

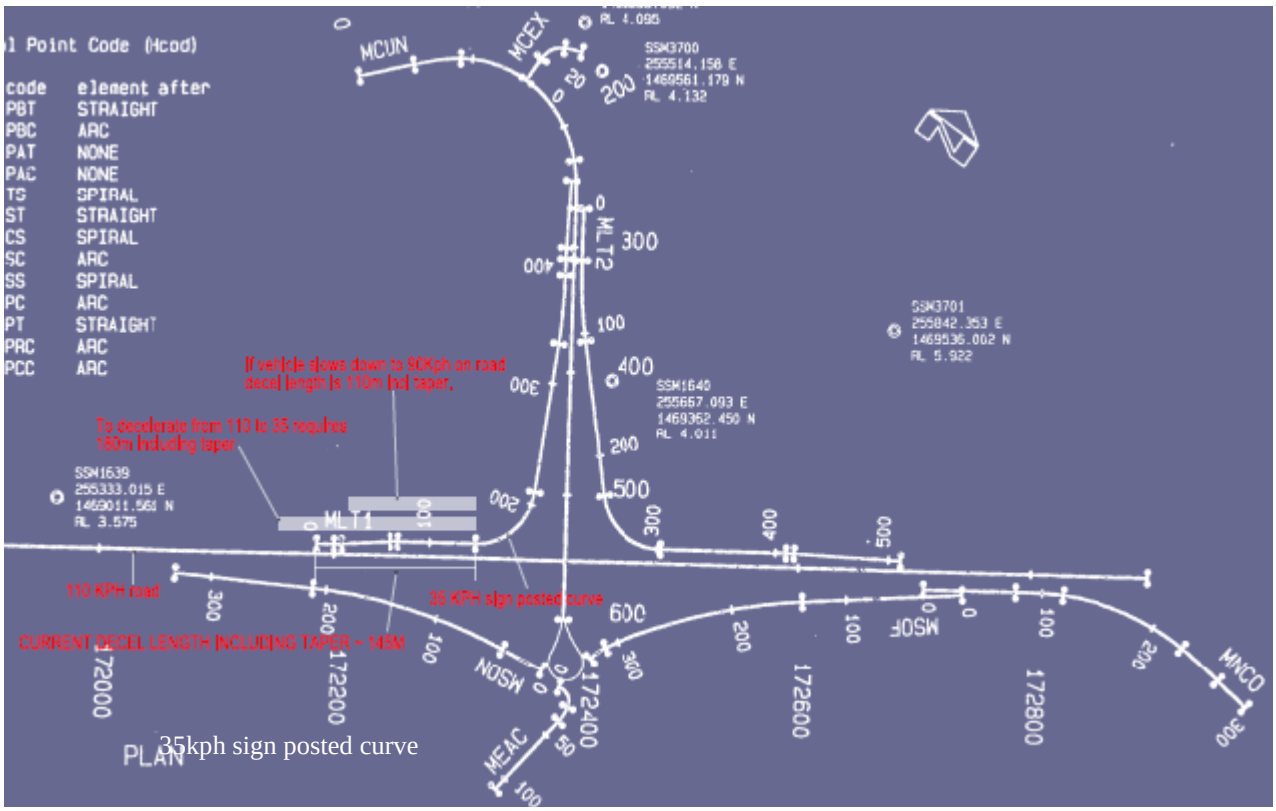


Figure 8-1: Cundletown Interchange - Alignment Details

Discussion

The alignment shown in Figure 8-1 indicates that the northbound off-ramp is constrained by a 35kph curve at the end of the deceleration lane. Therefore it is necessary for any vehicle leaving the Highway would need to slow down to approximately 90kph before entering the deceleration lane in order to negotiate the 35kph curve at the end of the deceleration lane.

The Austroads Guide to Road Design Part 4A set out in Table 5-2 Deceleration Distances required for a cars as presented in Figure 8-2 below:

Table 5.2: Deceleration distances required for cars on a level grade

Design speed of approach road (km/h)	Length of deceleration D – including diverge taper *T* (m)										Diverge length Ld[3] for lane widths (m)	
	Stop condition[1] (m)		Design speed of exit curve (km/h)[2]									
	0	0	20	30	40	50	60	70	80	90	3.5 m[4]	3.0 m[4]
	Comfortable 2.5 m/s²	Maximum 3.5 m/s²	Comfortable average rate of deceleration 2.5 m/s²									
50	40	30	30	25	15						33	27
60	55	40	50	40	30	15					40	33
70	75	55	70	60	50	40	20				47	40
80	100	70	95	85	75	60	45	25			54	44
90	125	90	120	110	100	85	70	50	25		60	50
100	155	110	150	140	130	115	100	80	55	30	67	57
110	185	135	180	175	160	150	130	110	90	60	74	62

1 *Rates of deceleration are: 2.5 m/s² for comfortable deceleration; 3.5 m/s² is the maximum for design purposes.*
2 *Speed of exit curve depends on radius and crossfall (Figure 5.2).*
3 *Distance Ld assumes a lateral rate of movement of 1.5 m/s.*
4 *Example lane widths – use actual lateral shift distance of vehicle.*

Notes:
The pink shading indicates that the deceleration lengths given are greater than the diverge length. The length of the deceleration lane should be based on these values.
The green shading indicates that the diverge length is greater than the deceleration length. In these cases, the length of the deceleration lane should be based on the diverge length (the values shown in yellow shading).
Adjust for grade using Table 5.3.

Source: Department of Main Roads (2006)[16].

Based on the criteria set out in Figure 8-2 a car would require 175 m to reduce their speed from 110 kph to 35 kph. The length of the existing deceleration lane including the taper is approximately 110m. Therefore a driver would need to start slowing down approximately 65m before they enter the deceleration lane.

The Austroads Guide indicates that the length of the turning lanes should be designed for the deceleration of cars. Accordingly it is considered that the northbound deceleration lane should be extended by approximately 65m in order to comply with current standards.

The Austroads Guide also makes an allowance for trucks to reduce speed in the through lane before entering the deceleration lane.

It is also important to note that the design requirements for Deceleration lanes detailed above were in place in 1997 when the Interchange was constructed. The southbound exit ramp has a sweeping left hand curve which provides 300m deceleration distance. However it would appear that designers working for the Roads and Traffic Authority took the view that these design rules could be relaxed for the northbound exit ramp.

It would also appear that the interchange has performed adequately over the last 22 years. A check on the 5 year accident history for the interchange indicates that there has only been one rear end accident on the southbound exit ramp at the Interchange. However, a review of Google Maps images (July 2018) indicate that the "EXIT" sign and a section of wire rope fencing have been damaged recently as shown in Figure 8-2 below:

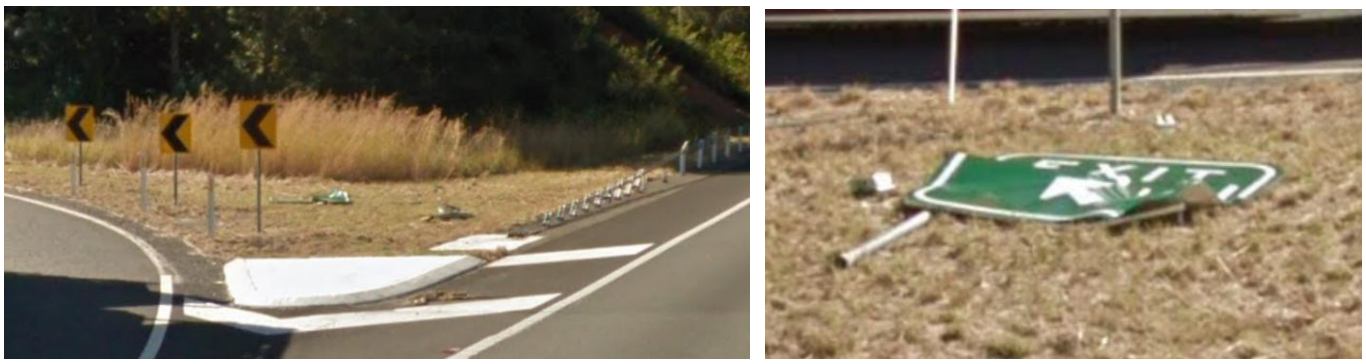


Figure 8-2: Google Map Images of Damaged Sign and Wire Rope Fence on Nthb Exit Ramp

Based on this review of the design of the ramp it is considered that there is a need for additional signposting to be installed on the southern approach to the northbound exit ramp advising drivers that the safe exit speed at this ramp is 90kph.

It is also considered that this signposting and any other improvement works considered necessary at the Interchange relate to existing design deficiencies and do not relate to the impact of the proposed development.

9. RECOMMENDATION

Stage 2 of the proposed Transport Precinct can be accommodated with an upgrade to the existing intersection of Emerton Close and Princess Street to provide a two lane roundabout.

It is also acknowledged that in order to address an existing design deficiency, additional signposting is required on the southern approach to the interchange to advise drivers that the safe exit speed is 90kph.

Based on this assessment it is recommended that the proposed development be approved.

Appendix A

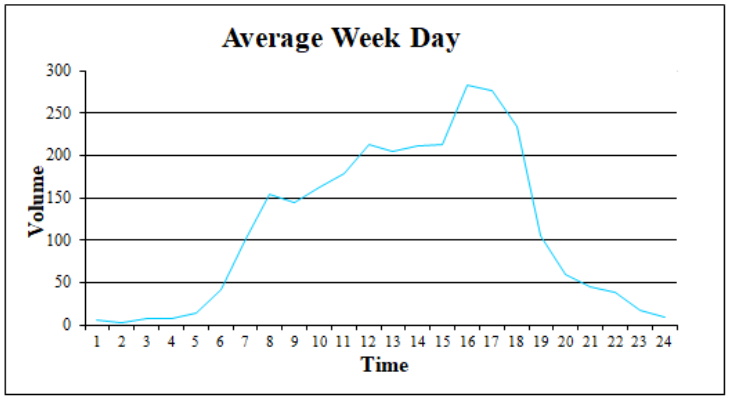
Existing Traffic Flows

Automatic Vehicle Counts

Princes St
East of Emerton Close

Site 1 NORTHBOUND ON RAMP, 100M WEST PACIFIC HWY, [60] Northbound

Day	Thu	Fri	Sat	Sun	Mon	Tue	Wed	W/Day	W/End	7 Day
Time	21/03/19	22/03/19	23/03/19	24/03/19	25/03/19	26/03/19	27/03/19	Ave.	Ave.	Ave
0:00	3	9	14	9	7	9	2	6	12	8
1:00	4	2	5	2	1	2	5	3	4	3
2:00	5	10	5	4	9	7	6	7	5	7
3:00	8	5	3	3	5	9	9	7	3	6
4:00	11	18	10	8	16	15	12	14	9	13
5:00	46	45	23	15	42	39	39	42	19	36
6:00	106	97	36	37	93	101	93	98	37	80
7:00	157	162	62	52	141	148	161	154	57	126
8:00	152	147	130	84	152	136	131	144	107	133
9:00	168	172	139	155	163	148	164	163	147	158
10:00	177	178	221	174	167	171	197	178	198	184
11:00	210	223	229	188	193	210	224	212	209	211
12:00	200	221	189	153	210	186	205	204	171	195
13:00	192	245	199	124	182	213	224	211	162	197
14:00	244	235	184	166	193	188	207	213	175	202
15:00	275	288	165	145	278	289	287	283	155	247
16:00	289	260	160	107	255	295	283	276	134	236
17:00	233	224	126	82	213	257	246	235	104	197
18:00	101	113	85	68	109	100	105	106	77	97
19:00	66	54	46	43	49	65	66	60	45	56
20:00	53	39	47	36	38	48	48	45	42	44
21:00	32	58	21	24	33	35	36	39	23	34
22:00	18	25	26	8	18	14	14	18	17	18
23:00	5	15	11	5	10	9	9	10	8	9
Total	**2755**	**2845**	**2136**	**1692**	**2577**	**2694**	**2773**	**2729**	**1914**	**2496**

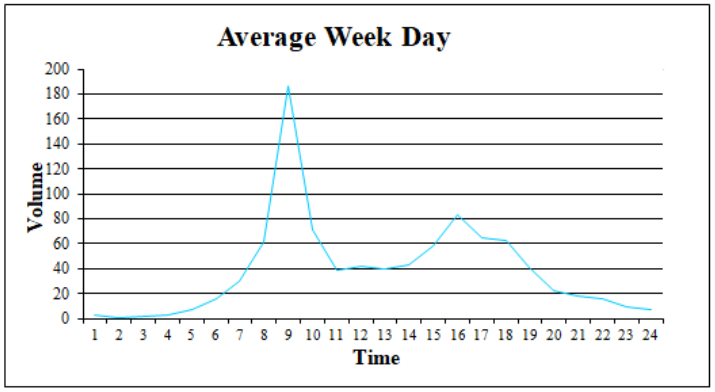


Summary

	from	to	
AM Peak	11:00 AM	12:00 PM	**224**
PM Peak	4:00 PM	5:00 PM	**295**
		Week Day Average	**2729**
		Weekend Day Average	**1914**
		7 Day Average	**2496**

Site 1 NORTHBOUND OFF RAMP, 100M WEST OF PACIFIC HWY [60] **Northbound**

Day	*Thu*	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*Wed*	*W/Day*	*W/End*	*7 Day*
Time	21/03/19	22/03/19	23/03/19	24/03/19	25/03/19	26/03/19	27/03/19	*Ave.*	*Ave.*	*Ave*
0:00	0	0	6	6	4	4	5	3	6	4
1:00	0	2	3	3	0	0	1	1	3	1
2:00	1	2	1	3	0	4	2	2	2	2
3:00	4	1	0	2	3	2	2	2	1	2
4:00	6	5	3	2	11	8	6	7	3	6
5:00	17	20	3	3	15	13	15	16	3	12
6:00	28	34	8	5	27	27	34	30	7	23
7:00	55	51	19	5	56	69	74	61	12	47
8:00	218	176	42	25	160	177	203	187	34	143
9:00	79	80	32	28	80	66	52	71	30	60
10:00	28	46	45	45	41	30	50	39	45	41
11:00	32	48	64	48	38	41	50	42	56	46
12:00	53	46	34	44	33	31	37	40	39	40
13:00	51	54	61	48	22	41	44	42	55	46
14:00	52	59	63	50	59	56	64	58	57	58
15:00	83	69	42	44	93	86	87	84	43	72
16:00	76	54	49	51	79	55	62	65	50	61
17:00	60	55	27	45	54	67	77	63	36	55
18:00	45	49	23	27	33	44	34	41	25	36
19:00	17	34	19	26	16	22	22	22	23	22
20:00	22	19	18	8	11	19	20	18	13	17
21:00	17	22	23	11	13	10	15	15	17	16
22:00	9	13	18	8	7	10	9	10	13	11
23:00	9	8	5	3	6	6	8	7	4	6
Total	**962**	**947**	**608**	**540**	**861**	**888**	**973**	**926**	**574**	**826**

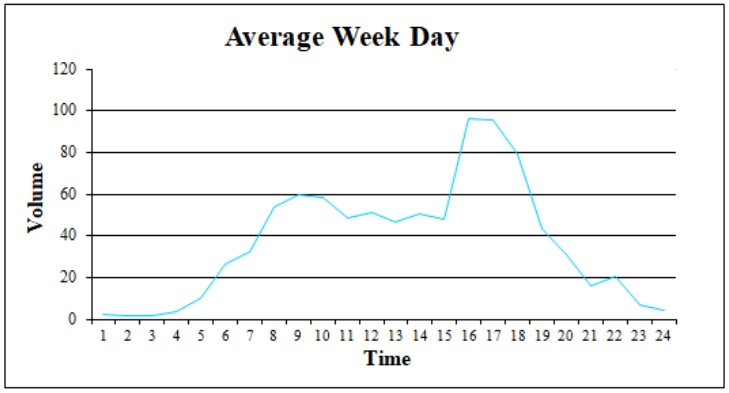


Summary

	from	to	
AM Peak	8:00 AM	9:00 AM	**218**
PM Peak	3:00 PM	4:00 PM	**93**
		Week Day Average	**926**
		Weekend Day Average	**574**
		7 Day Average	**826**

Site 2 SOUTHBOUND ON RAMP, 100M WEST OF PACIFIC HWY, [60] **Southbound**

Day	*Thu*	*Fri*	*Sat*	*Sun*	*Mon*	*Tue*	*Wed*	*W/Day*	*W/End*	*7 Day*
Time	21/03/19	22/03/19	23/03/19	24/03/19	25/03/19	26/03/19	27/03/19	*Ave.*	*Ave.*	*Ave*
0:00	1	2	3	5	4	2	1	2	4	3
1:00	1	3	1	2	3	1	0	2	2	2
2:00	2	1	2	3	2	1	3	2	3	2
3:00	5	2	2	3	6	5	1	4	3	3
4:00	11	12	2	2	11	10	8	10	2	8
5:00	28	22	13	7	29	28	24	26	10	22
6:00	38	30	22	10	29	28	37	32	16	28
7:00	52	55	21	18	52	52	57	54	20	44
8:00	65	59	27	29	50	68	58	60	28	51
9:00	46	77	53	62	59	42	67	58	58	58
10:00	49	52	71	53	49	45	48	49	62	52
11:00	48	59	73	77	48	53	48	51	75	58
12:00	49	50	60	53	37	42	54	46	57	49
13:00	63	68	46	50	39	39	44	51	48	50
14:00	50	50	42	43	45	50	44	48	43	46
15:00	98	108	46	49	83	93	98	96	48	82
16:00	92	94	58	43	100	95	97	96	51	83
17:00	96	55	49	39	88	75	81	79	44	69
18:00	40	31	32	27	62	33	52	44	30	40
19:00	26	20	14	20	31	41	36	31	17	27
20:00	21	17	18	11	16	15	10	16	15	15
21:00	28	24	18	8	13	19	20	21	13	19
22:00	9	8	17	5	5	9	3	7	11	8
23:00	3	9	6	5	4	1	5	4	6	5
Total	**921**	**908**	**696**	**624**	**865**	**847**	**896**	**887**	**660**	**822**

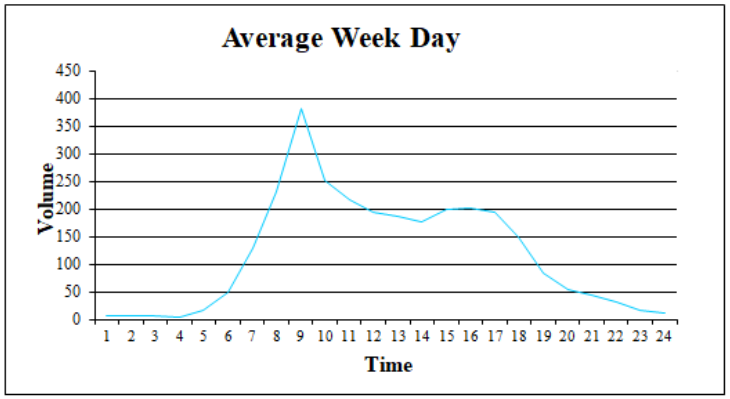


Summary

	from	to	
AM Peak	9:00 AM	10:00 AM	**77**
PM Peak	3:00 PM	4:00 PM	**108**
		Week Day Average	**887**
		Weekend Day Average	**660**
		7 Day Average	**822**

Site 2 SOUTHBOUND OFF RAMP, 100M OFF PACIFIC HWY [60] — Southbound

Day	Thu	Fri	Sat	Sun	Mon	Tue	Wed	W/Day	W/End	7 Day
Time	21/03/19	22/03/19	23/03/19	24/03/19	25/03/19	26/03/19	27/03/19	Ave.	Ave.	Ave
0:00	3	9	12	7	3	9	4	6	10	7
1:00	10	3	7	1	8	4	3	6	4	5
2:00	5	10	4	9	6	3	8	6	7	6
3:00	8	6	2	3	1	3	3	4	3	4
4:00	18	12	5	3	11	17	18	15	4	12
5:00	44	41	20	15	50	54	57	49	18	40
6:00	142	108	39	31	120	140	129	128	35	101
7:00	249	218	92	44	209	238	239	231	68	184
8:00	360	364	171	101	378	389	415	381	136	311
9:00	239	266	188	154	230	251	270	251	171	228
10:00	226	217	233	147	192	217	225	215	190	208
11:00	220	201	204	176	173	189	184	193	190	192
12:00	196	221	155	170	192	165	158	186	163	180
13:00	179	190	146	210	164	191	160	177	178	177
14:00	193	227	187	173	209	175	191	199	180	194
15:00	195	221	144	159	198	174	223	202	152	188
16:00	203	190	127	122	178	196	207	195	125	175
17:00	162	137	106	106	130	156	160	149	106	137
18:00	90	104	109	77	75	77	77	85	93	87
19:00	57	82	75	70	32	54	42	53	73	59
20:00	43	45	53	44	50	35	40	43	49	44
21:00	34	41	45	24	25	22	29	30	35	31
22:00	10	19	44	13	13	20	17	16	29	19
23:00	15	12	27	7	6	7	12	10	17	12
Total	**2901**	**2944**	**2195**	**1866**	**2653**	**2786**	**2871**	**2831**	**2031**	**2602**



Summary

	from	to	
AM Peak	8:00 AM	9:00 AM	**415**
PM Peak	2:00 PM	3:00 PM	**227**
		Week Day Average	**2831**
		Weekend Day Average	**2031**
		7 Day Average	**2602**

Appendix B

Business Park Trip Rates

RMS Letter of Approval 29th June 2007

325RZ1;1
07/892, 07/864
Brad Parkes

Director, Strategic Assessment
NSW Department of Planning
Strategic Sites and Urban Renewal
GPO Box 39
SYDNEY NSW 2001

Attention: Mr David Gibson

FREEWAY NORTH BUSINESS PARK – CONCEPT PLAN AND PROJECT APPLICATION

Dear Mr Gibson

I refer to your letters dated 14 May 2007 (Your reference: MP 06_0199) regarding the proposed Freeway North Business Park concept plan and project application referred to the RTA for comment.

The RTA's primary interests are in the road network, traffic and broader transport issues, particularly the efficiency and safety of the classified road network, the security of property assets and the integration of land use and transport. With regard to the proposed rezoning, the RTA's main concerns are with the traffic generating impacts on the classified road network.

In accordance with the *Roads Act 1993*, the RTA has powers in relation to road works, traffic control facilities, connections to roads and other works on the classified road network. As the New England Highway and Weakleys Drive (HW9) are part of the National Network and John Renshaw Drive (MR588) is a classified State road, RTA concurrence is required for connections to the roads under Section 138 of the Act, with Council consent. Council is the roads authority for roads in the area, except for the F3 Freeway.

The RTA has reviewed the information provided and objects to the concept plan and project application as proposed until the following matters have been addressed:

- A revised traffic study shall be prepared in accordance with the RTA's *Guide to Traffic Generating Developments* to the satisfaction of the RTA, in conjunction with a revised concept plan for the whole area and address the following issues, as a minimum:
    - The current traffic study only addresses the impacts of the 90-lot subdivision site, not the entirety of the concept plan area. The study shall consider the impacts of the whole concept plan area and identify the impacts on all State roads, not just Weakleys Drive. The intended access arrangements and road infrastructure modifications/additions should be outlined, together with the proposed staged implementation. All electronic data/calculation files should be provided.

Roads and Traffic Authority
59 Darby Street
Newcastle NSW 2300
Locked Bag 30 Newcastle NSW 2300
DX 7813 Newcastle
T 02 4924 0240
www.rta.nsw.gov.au

- The Freeway North business park area has been the subject of past investigations by the RTA and Council, which has resulted in the adoption of an access management scheme and intended road hierarchy for the areas surrounding Weakleys Drive, the New England Highway and John Renshaw Drive. As a result, Newcastle City Council has an adopted Development Control Plan (DCP) for this area. (Newcastle Development Control Plan 2005, Element 7.3 – South Beresfield Industrial Precinct).

  The current proposal is inconsistent with the DCP in terms of the road hierarchy and connectivity to the arterial road network in the following manner:

  - A collector road should be provided from Weakleys Drive to the north-west, connecting to sites further west in the area of Avalon Drive.
  - The location of the proposed roundabout is different to that previously identified by Council and the RTA, included in the DCP.
  - An additional access is proposed to Weakleys Drive via a left in / left out treatment.

  These matters would need to be resolved further in consultation with the RTA and Council.

  Comment: If the accesses are varied from those included in the current DCP, modifications to this instrument would be required.

- In terms of road hierarchy, it is expected that a connected local road network be established within the area of the entire business park to ensure that the State road network is not used for local trips. In this regard, the following comments apply:

  - The north-western connection into the area should be constructed to the extent of the development area to provide for future connectivity.
  - Connections should be made to existing developments and local roads to ensure that development areas are not isolated and require direct access to State roads. The currently proposed subdivision is isolated from areas to the south and north.
  - The land to the north of the study area should be provided with internal connectivity to remove the need for direct access to the New England Highway, consistent with the land fronting Weakleys Drive and the intended future internal road provision.
  - The concept plan should be modified to demonstrate the ultimate road network within the entire area, including those sites outside of the currently proposed subdivision.

- While the intended land uses for the development area, used in the traffic study, are for industrial / business park, the concept plan outlines that the proposed LEP amendment would desirably allow land uses such as retail, commercial, hotel/motel accommodation, etc. The RTA is concerned that this area could develop like other bulky goods retail developments the area, where high traffic generating restaurant/takeaway outlets have been included under the guise of local shops. These land uses are totally inconsistent with the traffic generation rates used within the traffic study and should be adjusted accordingly, if these uses are deemed permissible. These higher order traffic generating

uses are likely to have a major impact on road infrastructure requirements in this area, on roads which are already congested during peak traffic periods.

- The supplementary traffic report prepared by Maunsell (February 2007) outlining some justification for lower traffic generation rates has been reviewed by the RTA. The traffic generation rates to be utilised for assessment of the business park (industrial) land uses shall be increased to 0.58 and 0.70 peak trips in the AM and PM peak hours respectively. This would increase again if the uses proposed are adopted.

- The future traffic volumes using the north-western connection into the site shall be included in the assessment of the intersections.

- No direct access to any lots shall be permitted to the New England Highway, Weakleys Drive or John Renshaw Drive.

- The site is subject to road widening. The applicant shall dedicate any land required for road widening at no cost to the Council or RTA.

Further comments and requirements will be provided when the above information is forwarded through the Department.

Please contact me on 4924 0688 if you require further advice.

Yours sincerely

Dave Young
Manager, Land Use Development
Hunter Operations & Engineering Services

29 June 2007

Cc Mr Luke Ryan
Newcastle City Council

Appendix C

Assessment of Hunter Valley Business Park Trip Rates

Executive Summary

Maunsell / AECOM
31st January 2007

Assessment of Hunter Valley Business Park Trip Rates

Final Report

Hunter Land Pty Ltd

31 January 2007

MAUNSELL | AECOM

Executive Summary

Maunsell was commissioned by Hunter Land in November 2006 to gather trip rates for Hunter Valley Business Parks.

Historically, traffic assessments for Hunter Land's developments have been undertaken using the Guide to Traffic Generating Developments (RTA, 2002). However, anecdotal evidence suggested that actual traffic generated from such developments was lower than the NSW Roads and Traffic Authority (RTA) rates, and therefore to use the rates would lead to overprovision of transport infrastructure. The anecdotal evidence was further strengthened following a survey of the actual traffic generated by the Rutherford Industrial Estate undertaken as part of the Anambah Traffic Impact Study (NPTE, September 2006).

The Maunsell study was undertaken in two parts:

- Actual trip rates at four existing developments were measured.
- The background to the RTA Business Park trip rates was examined and compared to actual Hunter Land sites to understand why the trip rates differ.

The surveys found that two-way vehicle peak hour trip rates (including employee vehicles and service vehicles) varied between 0.4 to 0.6 vehicle trips per $100m^2$ Gross Leasable Floor Area (GLFA) over the four sites as shown in **Table E.1**.

Table E.1: Trip rates

Site	Peak hour trip rate/ $100m^2$ GLFA	
	AM	PM
Thornton Industrial Estate	0.52	0.63
Racecourse Business Park	0.46	0.56
Freeway Business Park	0.50	0.54
Holmwood Business Park	0.37	0.42
Average of all Sites	0.47	0.56

Source: Maunsell 2006

Peak service vehicle (truck) movements to and from the Hunter Valley Business Parks are 0.1 vehicle trips per $100m^2$ GLFA at all sites, which is 20 per cent of the RTA peak service vehicle rate of 0.5 vehicle trips per $100m^2$ GLFA, suggested in the Guide to Traffic Generating Developments (RTA, 1992). While this does not affect peak hour trip rates (as service vehicles are already included in these rates), it does confirm that vehicle movements at the surveyed sites are lower than those reported in the RTA rates.

As shown in **Table E.2**, analysis of business park attributes suggests that lots are less densely developed (and that there is more floorspace per employee) in the Hunter than in Sydney.

Table E.2: GLFA Ratios

Site	GLFA m^2/ employee	GLFA m^2/ site area
RTA Sydney Surveys[a]	81[b]	0.64
Thornton Industrial Estate	92	0.28
Racecourse Business Park	212	0.30
Freeway Business Park	136	0.39
Holmwood Business Park	n/a[c]	0.32

Source: Maunsell 2006

[a] Land Use Traffic Generation Data and Analysis 27: Business Parks, RTA, 1994

[b] Number of employees is an approximation based on the person trip rate at the RTA Sydney sites that were surveyed in support of the RTA trip rate.

[c] Employee data not available for Holmwood Business Park

On the basis of this analysis, it is recommended that trip rates from comparable developments (i.e. Hunter Valley Business Parks) be used for future Hunter Land traffic impact assessments. The business park trip rate of 0.6 vehicle trips per $100m^2$ GLFA should be adopted, rather than the 1.1 vehicle trips per $100m^2$ summarised in the Guide to Traffic Generating Developments (RTA, 1992) and detailed in Land use Traffic Generation Data and Analysis 27: Business Parks (RTA, 1994).

The use of Hunter Valley trip rates is supported by evidence that:

- the development ratio (lot area/ GLFA) is 50 per cent lower;
- there is 65 per cent more building space per employee in Hunter Land developments; and
- vehicle trips are more evenly distributed across the peak periods.