

Appendix E

Traffic Impact Assessment

A photograph of a rural landscape featuring several large, mature trees with light-colored bark and dense green foliage. The trees are set against a clear blue sky. In the foreground, there is a grassy field with some rocks. The background shows a line of trees and a fence.

TRAFFIC IMPACT ASSESSMENT

LIFESTYLE VILLAGE – MANUFACTURED HOME ESTATE

**LOTS 100 & 101 IN DP 1230313
207 WOLLOMBI ROAD, FARLEY**

PREPARED FOR: RAVENSFIELD DOWNS PTY LTD

NOVEMBER 2018

REF:18/161

**TRAFFIC IMPACT ASSESSMENT
MANUFACTURED HOME ESTATE
FARLEY LIFESTYLE VILLAGE****LOTS 100 & 101 IN DP 1230313,
207 WOLLOMBI ROAD, FARLEY**

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This document has been prepared, checked and released in accordance with the Quality Control Standards established by Intersect Traffic Pty Ltd.

Issue	Date	Description	By
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B	05/11/16	Edit	JG
C		Final Proof	JG
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This document has been authorised by

Date November 2018

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1. INTRODUCTION

Intersect Traffic Pty Ltd (Intersect Traffic) was engaged by Ravensfield Downs Pty Ltd to prepare a traffic impact assessment for a Manufactured Home Estate on Lots 100 & 101 in DP 1230313 - 207 Wollombi Road, Farley. The development consisting of 295 mobile home allotments will be used for permanent housing for residents over the age of fifty (50) however approval is not being sought under the Seniors Living SEPP. Access to the site is proposed via the adjoining residential subdivision to the north. The proposed development plans are provided within **Appendix 1**.

The aim of this assessment is to determine the impact of the proposal on the adjacent local road network due to the traffic generated by the development and assess the development against the traffic, parking and access requirements of Maitland City Council contained within its DCP (2011). This will allow Council to assess the traffic related merits of the proposal.

This report is required to support a development application to Maitland City Council and presents the findings of the traffic impact assessment which includes the following:

1. An outline of the existing road network in the vicinity of the proposed development.
2. An assessment of the likely peak traffic generation from the development.
3. An assessment of the likely traffic impacts of the proposal on the adjacent road network in terms of the capacity of the existing road network linking to the sub-arterial road network.
4. An assessment of the proposed development's access and on-site parking.
5. Reviews available alternate transport mode opportunities and constraints; and
6. Presentation of conclusions and any recommendations.

This assessment has been carried out with reference to the RMS' *Guide to Traffic Generating Developments, Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005*, Austroads *Guide to Road Design Guidelines* (2009), Australian Standards AS2890.1-2004 – *Parking facilities – Part 1 – Off street car parking*, Maitland City Council's *Manual of Engineering Standards* and Maitland City Council's DCP (2011) as well as utilising information provided by Wollombi Road Pty Ltd.

2. SITE DESCRIPTION

The subject site is located on the southern side of Wollombi Road, Farley south of the approved residential subdivision approximately 500 metres west of Owlpen Lane which was under construction as at November 2018. The site lies approximately 10 kilometres east of Maitland, 23 km west of Cessnock and 5 kilometres southwest of Rutherford. The development site’s northern and eastern boundaries adjoin the residential subdivision currently under construction whilst its southern and western boundaries adjoin rural land. The development site is shown in the context of the surrounding development and land in **Figure 1** below.

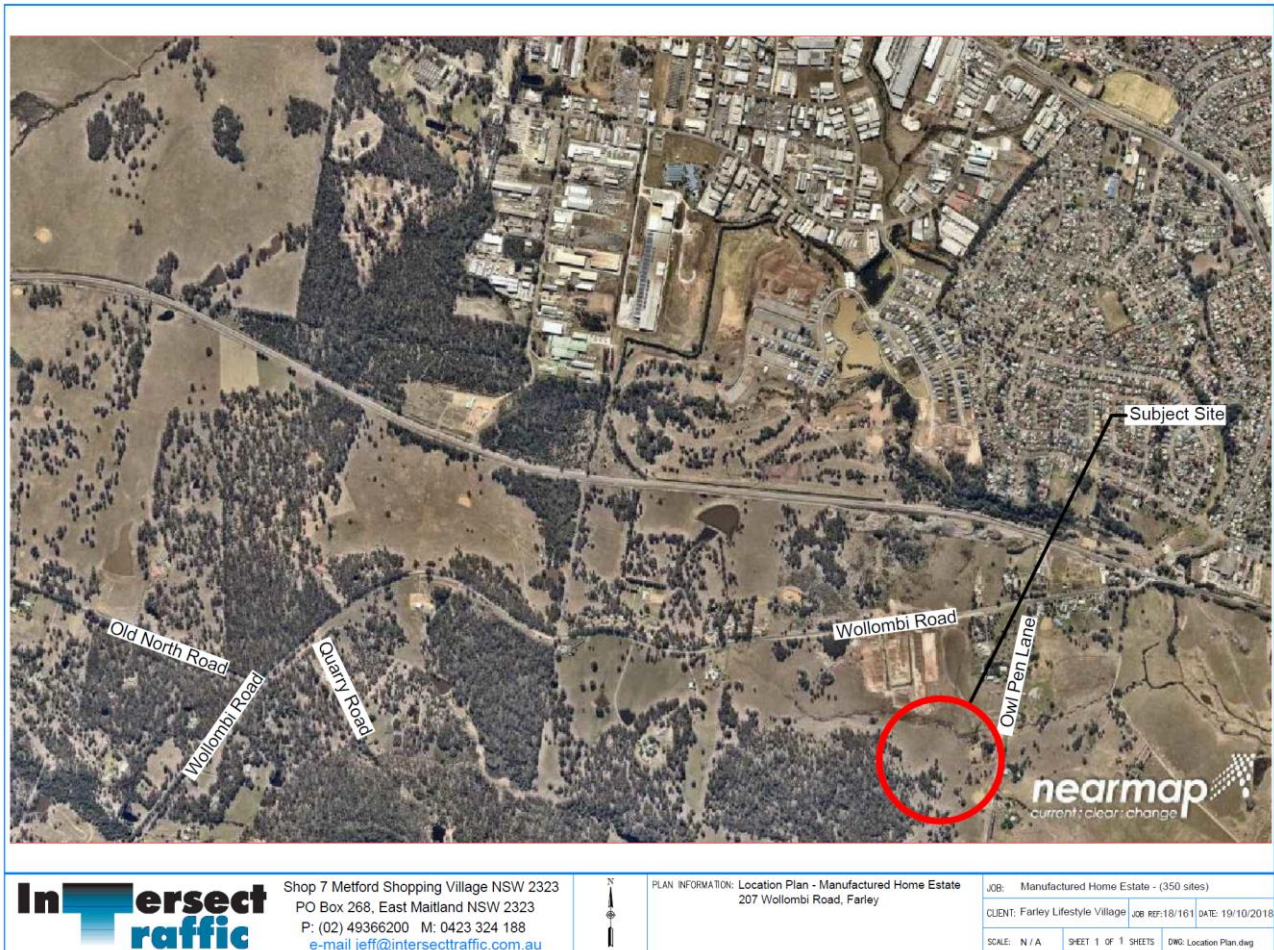


Figure 1 – Site Location Plan

The site contains the following property descriptors:

- ◆ Lots 100 & 101 in DP 1230313;
- ◆ Postal address of 207 Wollombi Road, Farley;
- ◆ Development site area of approximately 25 ha; and
- ◆ Land zoning of RU2 – Rural Landscape in accordance with Maitland LEP (2011).

The development site area is vacant land. Access to the site can currently occur from Owlpen Lane and Quarry Road but will be primarily obtained via the public roads of the adjoining residential development to the north and east when current construction is completed with an emergency only access to Owlpen Lane being provided. No formal accesses currently exist to the development site area.

Photographs 1 & 2 below show the area of the site proposed for development.



Photograph 1 – Development Site with Owlpen Lane to the left / east



Photograph 2 – Development Site southwest of residential development

3. EXISTING ROAD NETWORK

3.1 Wollombi Road

Wollombi Road in the vicinity of the site is a two-lane two-way sealed road approximately 7 metres wide with sealed shoulders from 1.5 metres to 1.8 metres in width. An 80 km/h speed limit applies to this section of the road near the site. Under a functional road hierarchy Wollombi Road performs the function of a collector road collecting and distributing traffic to the arterial road to the east at Rutherford (New England Highway) and Old Maitland Road to the west at Cessnock. As a local road it is under the care and control of Maitland City Council and at the time of inspection it was observed to be in good condition.

The road is currently of rural type construction however near the site it is being developed with formed footpaths, kerb and gutter, limited street lighting and grass verges. The road east of Harlington Avenue is anticipated to be of urban style construction and that west of Harlington Avenue, a rural style construction until it is progressively upgraded as the URA develops. Wollombi Road near the Harlington Avenue roundabout is shown in **Photograph 3** below.



Photograph 3 – Wollombi Road looking west east of the Harlington Avenue roundabout

4. ROAD NETWORK IMPROVEMENTS

Maitland City Council's *DCP 2015 Farley Section 94 Plan* lists proposed road facilities upgrades some of which have already been constructed. The works include Wollombi Road upgrades, Owlpen Lane intersection and widening and Wollombi Road intersection constructions including the roundabout to the north and south URA, the western intersection access to north URA and the New England Highway (Multi Lane T). The details of the road facilities and the location map extracts from *Farley DCP* is shown below in **Figure 2**.

ROAD & TRAFFIC FACILITIES						
Facilities	Location	Estimated Cost	Land Acquisition	Total	Timing/ Staging	
Wollombi Road Upgrade						
Road Upgrade	F10 Green Street to Rail Bridge	\$996,050	\$10,588	\$1,006,638	Stage 1	
Road Upgrade	F11 Rail Bridge to Owlpen Lane	\$1,285,624	\$25,097	\$1,310,721	Stage 1	
Road Upgrade	F12 Owlpen Lane to Western Intersection (excludes intersections)	\$1,969,941	\$43,947	\$2,013,888	Stage 1	
Road Upgrade	F13 Western Intersection to Bends	\$782,645	\$32,947	\$815,592	Stage 3	
Road Upgrade	F14 Bends to URA Boundary	\$1,239,327	\$42,831	\$1,282,157	Stage 3	
Owlpen Lane Intersection + Widening						
T Intersection + Road Upgrade	F15 Realign T Intersection + Widening across selected frontages	\$927,239	\$120,403	\$1,047,642	Stage 1	
Intersections						
Roundabout	F16 Wollombi Road Central Precinct - access to north & south URA	\$2,229,587	\$108,967	\$2,338,554	Stage 1	
Upgraded T	F17 Wollombi Road Western Intersection - access to north URA	\$261,222	\$28,050	\$289,272	Stage 2	
Signalised Intersection	F18 New England Highway/Wollombi Road - Multi Lane T	**\$1,646,087	\$0	\$1,646,087	Stage 1	
Total		\$11,337,723	\$412,829	\$11,750,552		
Notes						
* All items include survey and legal costs						
** An amount of \$725,158 has been deducted from the total estimated cost of these works in this Plan as funding is also available in the 2006 City Wide Plan for this item.						

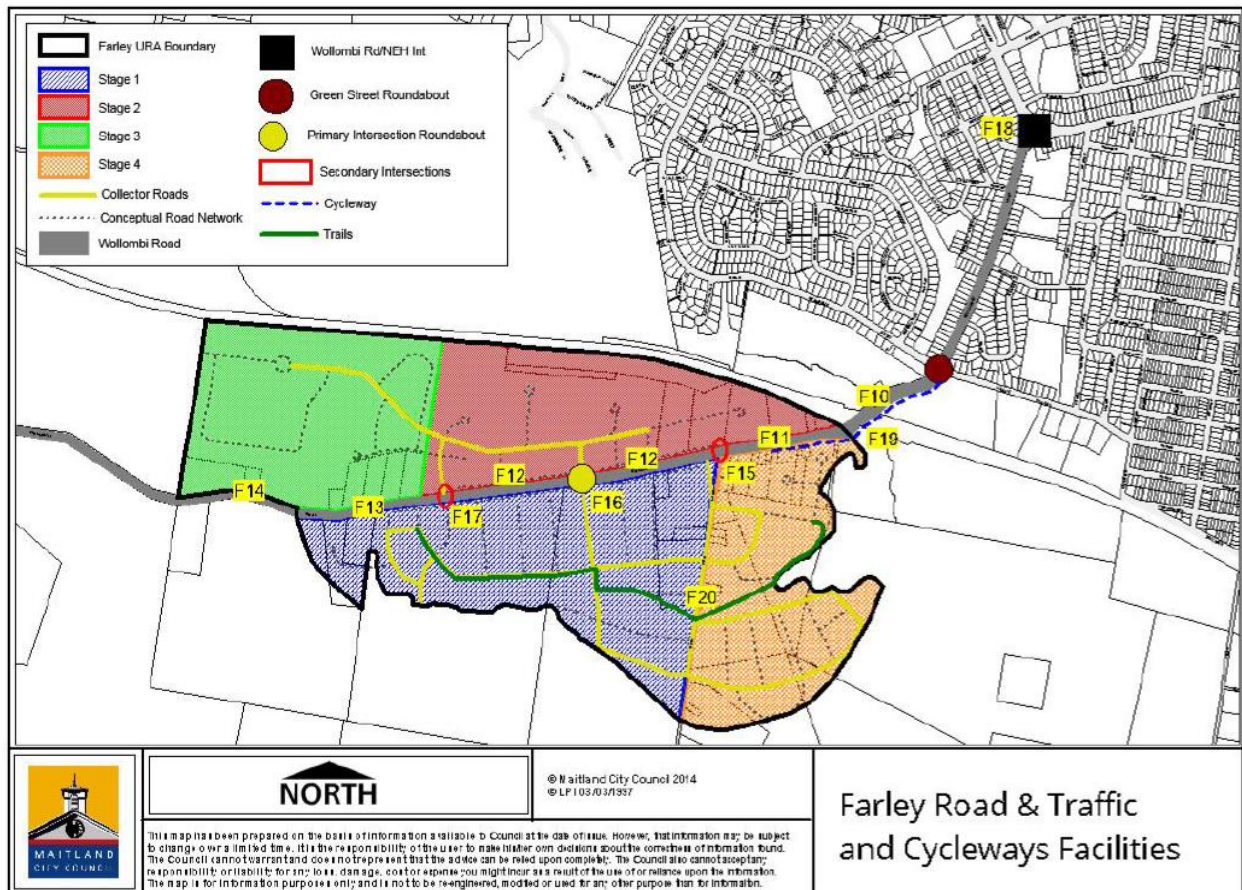


Figure 2 – Farley S94 Works Schedule & Plan

There are no other known road network improvements currently programmed that will increase the capacity of the local road network. Maintenance and reconstruction work in the area would be carried out in the future in line with Maitland City Council’s Annual Works Programmes.

5. TRAFFIC VOLUMES

Intersect Traffic carried out manual traffic counts at the intersection of Wollombi Road and Old North Road give way-controlled T-intersection (for another development approximately 2 kilometres west of the site). These counts were carried out during likely peak hour traffic volume times of 8.00am – 9.00am on Thursday 18th October 2017 AM and 4.15pm – 5.15pm on Wednesday 17th October 2018 PM. The mid-block traffic volumes adjacent to the Wollombi Road / Old North Road intersection have been estimated using the count data and utilised as existing 2018 two-way mid-block peak traffic volumes for Wollombi Road at this development site. The traffic count results are provided in **Attachment B**.

The predicted 2028 peak hour traffic volumes on Wollombi Road would normally be calculated by applying an annual growth rate factor, for infill development, of 1.5% to the 2018 peak hour traffic volumes. However, over the next 10-year period the Farley Urban Release Area (without the MHE development) generates an additional 6.5% growth per annum for traffic eastbound from Harlington Avenue and 1.5% growth per annum for traffic westbound from Harlington Avenue resulting in an annual increase of mid-block peak hour traffic of 8% eastbound and 3% westbound respectively. The 2018 and the predicted 2028 peak hour volumes based on these assumptions are as shown in **Table 1** below.

Table 1 – Mid-block 2018 and 2028 traffic volumes

Road	Location	2018 AM peak (vtph)	2018 PM peak (vtph)	2028 AM peak (vtph)	2028 PM peak (vtph)
Wollombi Road	East of Harlington Avenue	347	375	749	810
Wollombi Road	West of Harlington Avenue	349	364	469	489

It is noted that the traffic counts obtained for Wollombi Road northeast of Old North Road are utilised for east of Harlington Avenue and those for southwest of Old North Road are utilised as west of Harlington Avenue. The differences between both AM peak hour volumes are much less than the 10% usual peak hour variation experienced on the network and the same applies for both PM peak hour volumes. The use of these traffic volumes is considered relevant for this assessment.



6. ROAD CAPACITIES

In **Section 3** of the report it was noted that Wollombi Road is considered an urban road east of Harlington Road and a rural road west of Harlington Road near the site. An assessment of the mid-block capacity of Wollombi Road as both an urban and a rural road has been undertaken.

The capacity of urban and rural roads is generally determined by the capacity of intersections. Tables 4.3 and 4.4 of the RMS' *RTA's Guide to Traffic Generating Developments* provides some guidance on mid block capacities for urban roads and likely levels of service. These tables are reproduced below.

Table 4.3
Typical mid-block capacities for urban roads with interrupted flow

Type of Road	One-Way Mid-block Lane Capacity (pcu/hr)	
Median or inner lane:	Divided Road	1,000
	Undivided Road	900
Outer or kerb lane:	With Adjacent Parking Lane	900
	Clearway Conditions	900
	Occasional Parked Cars	600
4 lane undivided:	Occasional Parked Cars	1,500
	Clearway Conditions	1,800
4 lane divided:	Clearway Conditions	1,900

Table 4.4
Urban road peak hour flows per direction

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

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

A desirable level of service on an urban or rural road is generally considered to be a level of service (LoS) C. For an urban road noting a LoS D on a one way one lane road occurs when the mid-block traffic volumes exceed 900 vph (Table 4.4 above) then a Los D on a two-way one lane per direction occurs when mid-block traffic volumes exceed 1,800 vph. Therefore, it is considered that Wollombi Road east of Harlington Avenue near the site, as a two-lane two-way urban collector road, has a two-way mid-block road capacity of 1,800 vph.

Table 4.5 of the RMS's *Guide to Traffic Generating Developments* provides some guidance on mid-block capacities for rural roads and likely levels of service. The table is reproduced below.

Table 4.5
peak hour flow on two-lane rural roads (veh/hr)
(Design speed of 100km/hr)

Terrain	Level of Service	Percent of Heavy Vehicles			
		0	5	10	15
Level	B	630	590	560	530
	C	1030	970	920	870
	D	1630	1550	1480	1410
	E	2630	2500	2390	2290
Rolling	B	500	420	360	310
	C	920	760	650	570
	D	1370	1140	970	700
	E	2420	2000	1720	1510
Mountainous	B	340	230	180	150
	C	600	410	320	260
	D	1050	680	500	400
	E	2160	1400	1040	820

The data for Table 4.5 assumes the following criteria:

- *terrain level* with 20% no overtaking.
- *rolling* with 40% no overtaking.
- *mountainous* with 60% no overtaking.
- 3.7 m traffic lane width with side clearances of at least 2m.
- 60/40 directional split of traffic.

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

The criteria for Wollombi Road west of Harlington Avenue is a level terrain, 5% heavy vehicles and 80 km/h speed zoning. A desirable level of service on a rural road is generally considered to be a level of service (LoS) C or better. Noting a LoS D on a two-lane rural road with the above criteria occurs when mid-block traffic volumes exceed 1,550 vph, the two-way two-lane mid-block traffic volume threshold for a LoS C is 1,550 vph for a 100 km/h speed limit. However, a reduction in the order of 10% applies for a speed limit of 80km/h. Therefore, it is considered that Wollombi Road west of Harlington Avenue near the site, as a two-way rural road, has a mid-block road capacity of 1,395 vtp.

From the traffic data collected in **Section 5** and noting the likely two-way mid-block technical road capacities of Wollombi Road, east and west of Harlington Avenue, are in excess of the existing and predicted future (2028) traffic volumes it is considered that Wollombi Road near the development site is operating within its urban and rural technical capacities and has scope to cater for additional traffic generated by new development.

7. ALTERNATE TRANSPORT MODES

Hunter Valley Coaches runs public transport (bus) services nearest to the site. Route 183 (East Maitland – Maitland – Telarah - Rutherford) stops near the intersection of Wollombi Road and Green Street approximately 1.7 kilometres east of the site (see **Figure 3** below). This service provides access to the Rutherford bus terminus, Greenhills shopping centre, Maitland, East Maitland and a number of nearby railway stations facilitating access to an array of services and locations throughout the Maitland district and the Hunter Valley via bus or train.

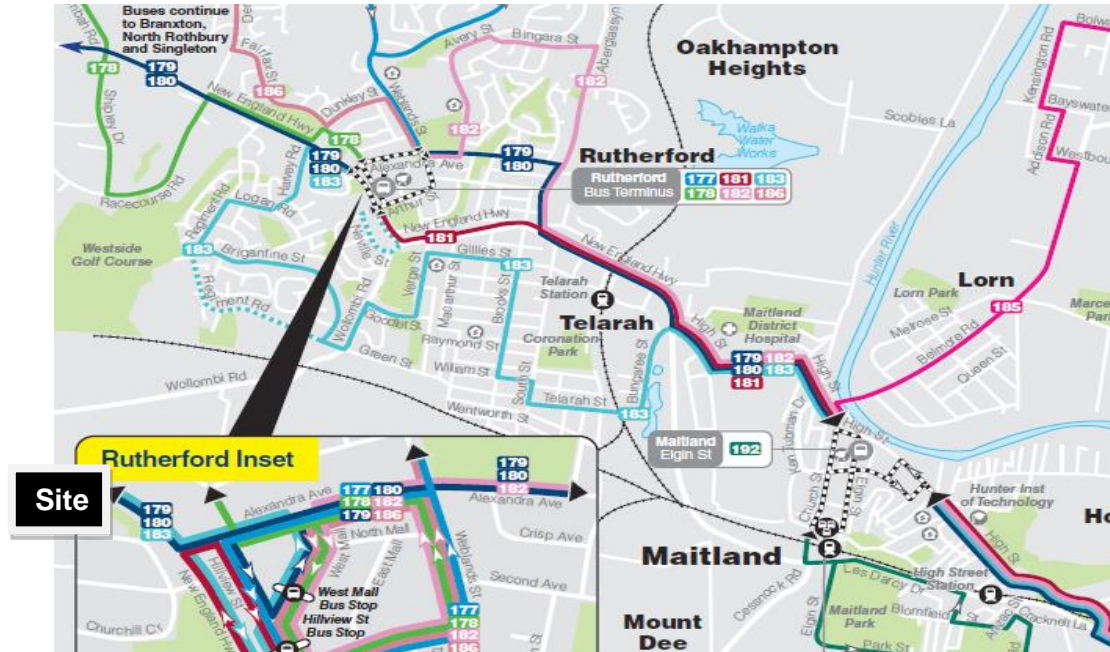


Figure 3 – Bus Route Map

A bus stop has been provided on Wollombi Road near Harlington Avenue approximately 300 metres from the development (see **Photograph 3** below) for future extension of this bus service to the Farley urban release area. The applicant has advised they would also provide a bus stop at the northern end (entrance) to this MHE development should Council and the bus company consider an extension of the service to the MHE.



Photograph 4 – Bus Stop with shelter – Wollombi Road near Harlington Avenue

The site location is 2 kilometres west of the Telarah residential area. There are no constructed, specific pedestrian only, footpaths near the site. However, footpaths for the residential subdivision south of Wollombi Road and adjoining this development are currently under construction and will link to the MHE development. Pedestrians would need to utilise the proposed residential footpaths for access to the site. Pedestrian refuges and pram ramps have been incorporated into the Wollombi Road / Harlington Avenue roundabout (see **Photograph 3** above). During site inspections and traffic counts no pedestrian traffic was observed in the area.

There are existing sealed road shoulders along Wollombi Road near the site that may be suitable for use by cyclists. A concrete shared pathway approximately 2.5 metres wide has recently been constructed along the north eastern side of the Wollombi Road / Harlington Avenue roundabout. During site inspections and traffic counts no cyclist traffic was observed in the area.



8. PROPOSED DEVELOPMENT

The proposed development involves the construction of a Lifestyle Village Manufactured Home Estate on the site to be predominantly used as permanent housing for people over the age of fifty (50). Approval for the development is however not being sought under the Seniors Living SEPP.

Specifically, the proposal involves;

1. The provision of 295 manufactured home sites and associated internal roads;
2. Connection of a new combined entry / exit driveway to the site off the new residential estate road;
3. Provision of internal pedestrian and visitor car parking areas;
4. Stormwater drainage infrastructure; and
5. Landscaping.

Further detailed planning post the URA rezoning phase has confirmed that projected lot yields will not eventuate due to site specific constraints. Accordingly, the applicant has advised that the proposal does not increase the net number of dwellings for the Farley Urban Release Area (Farley URA) and is accommodated within the lot/dwelling yield used in the Planning Proposal documents and reports for the Farley URA. Therefore, the proposal does not change the conclusions of the Traffic Reports for the Farley URA or require amendments to the S94 contributions plan. This is demonstrated within the Statement of Environmental Effects supporting the development.

9. TRAFFIC GENERATION

The RMS's *Guide to Traffic Generating Development's* does not provide generation rates for caravan parks but refers to use of the ITE Trip Generation Rates from the USA.

The closest development type in the RMS's *Guide to Traffic Generating Developments* would be medium density residential housing which has a daily trip generation of 4 to 5 trips per lot and a peak hour generation of 0.4 to 0.5 trips per lot for two (2) bedroom dwellings.

ITE Trip Generation Rates were researched over the Internet and a reference from material published by Mary Edwards _ "Community Guide to Development Impact Analysis" was located. Information in this paper included ITE references in relation to generation rates for Mobile Home Parks. This rate allowed 4.81 daily trips with an AM peak hour rate of 0.43 per lot and an ADT range between 2.29 to 10.42. An extract of this report/paper is attached as **Appendix 3**. A comparison of the two rates appears in **Table 2** below:

Table 2 – Comparison of traffic generation rates

Source	ADT	Peak Hour Trips
RMS Medium Density Residential (2 Bedrooms)	4 to 5 / dwelling	0.4 to 0.5 / dwelling
Community Guide to Development Impact Analysis_ by Mary Edwards	4.81 / dwelling	0.43 / dwelling AM

Both generation rates appear similar and the RMS rate is for a 2-bedroom residential dwelling which is likely to make up the majority of manufactured home dwellings on this site.

It is also noted that the RMS Technical Direction TDT 2013/04 identifies the following rates being applicable for **housing for seniors** based on ten surveys conducted in 2009, five within the Sydney urban area and five in regional New South Wales.

Weekday daily vehicle trips = 2.1 per dwelling

Weekday peak hour vehicle trips = 0.4 per dwelling

(Note that morning site peak hour does not generally coincide with the network peak hour)

In consideration of the information above and noting there is little difference in the crucial peak hour rates the following rates have been applied to this proposal which is predominantly for permanent housing for over 50's;

Rates.

Daily vehicle trips = 2.1 / site

Peak hour vehicle trips = 0.4 per site

In terms of traffic impact, the critical assessment period for this proposal is the PM peak hour traffic as the AM peak will not coincide with the network peak and the additional PM peak hour traffic volumes generated by the proposed development of 295 additional sites is calculated as follows:

$$\begin{aligned}
 \text{Peak hour trips} &= 295 \times 0.4 \text{ vtp} \\
 &= \mathbf{118 \text{ vtp}}
 \end{aligned}$$

Before carrying out any traffic assessment the additional external peak hour traffic generated by the development needs to be distributed through the adjoining road network. This involves making assumptions as to distribution patterns to and from the development. In distributing the peak hour traffic from the development site onto the adjacent road network the following assumptions have been made for this site:

- ◆ In the PM peak hour 30% of traffic will exit the site and 70% will enter the site;
- ◆ 100% of traffic will arrive and depart the development via the Wollombi Road / Harlington Avenue roundabout intersection; and
- ◆ 80% of the generated traffic will arrive and depart via Wollombi Road east and 20% will arrive and depart via Wollombi Road west.

The resulting development PM peak hour traffic trip distribution is shown in **Figure 4** below.

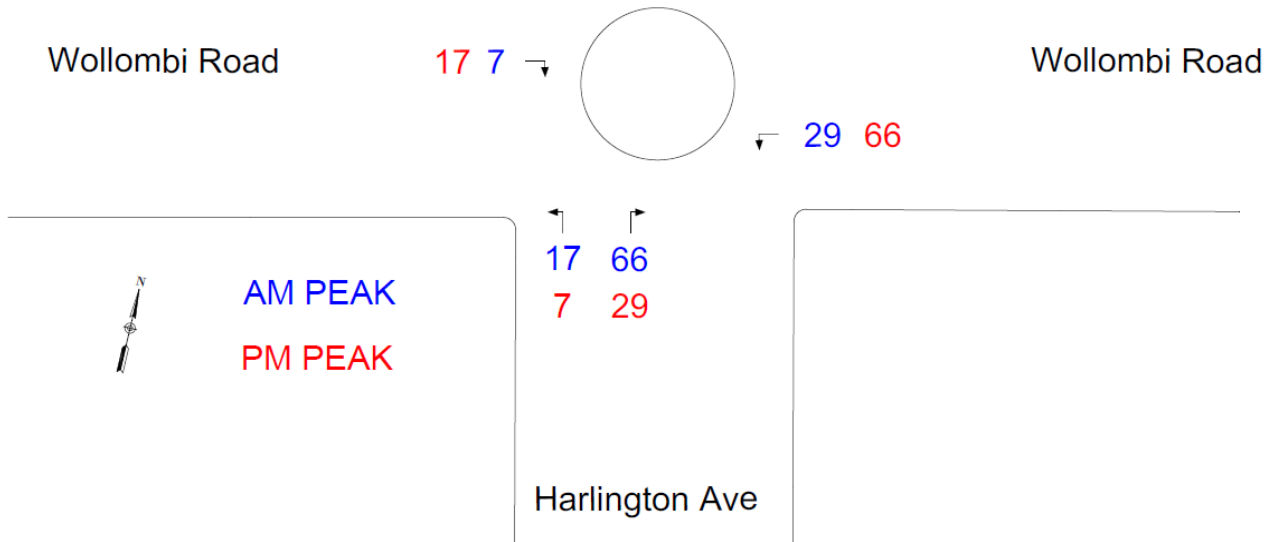


Figure 4 – Development Traffic PM Peak Hour Trip Distribution



10. TRAFFIC IMPACT ASSESSMENT

10.1 Road Network Capacity

It has previously been shown in **Section 6** of this report that the local road network is currently operating well within its technical mid-block capacity.

The proposed manufactured home estate is likely to generate the following additional traffic (maximum) on the local road network based on the trip distributions.

- ◆ Wollombi Road – east of Harlington Avenue - 112 vtpm AM peak and PM peak, and
- ◆ Wollombi Road – west of Harlington Avenue – 28 vtpm AM peak and PM peak.

The addition of this traffic onto the 2018 traffic volumes determined in **Section 5** will not result in the capacity thresholds for the local road network determined in **Section 6** to be reached. Even with the 2028 traffic volumes, determined by increasing the 2018 volumes by 8.0% traffic growth per annum east and 3.0% west over a ten-year period, these road capacity thresholds are not reached. This is demonstrated in **Table 3** below.

Table 3 - Road Capacity Assessment

Road	Location	Capacity (vtpm)	2018 AM peak (vtpm)	2018 PM peak (vtpm)	2028 AM peak (vtpm)	2028 PM peak (vtpm)	Development traffic	
							AM	PM
Wollombi Road	East of Harlington Avenue	1800	459	487	861	922	112	112
Wollombi Road	West of Harlington Avenue	1395	377	392	497	517	28	28

Therefore, in adding the peak development traffic generation volumes determined above to the various existing and likely future peak road traffic volumes in **Table 2** it can be concluded that the local and state road network has sufficient spare capacity to cater for the increase in traffic generated by the development and the development will not adversely impact on the two-way mid-block traffic flows on the local road network.

10.2 Intersection capacity

The main intersections likely to be impacted by the development are:

- Wollombi Road / Harlington Avenue 4-leg roundabout intersection, and
- Wollombi Road / New England Highway intersections.

The Wollombi Road / Harlington Avenue roundabout has been designed to cater for traffic generated by the full development of the Farley URA and as this proposal will not result in any increase in the final fully developed traffic volumes generated by the Farley URA there is no need to undertake further analysis of this intersection. Predicted post development traffic volumes through the roundabout even in 2028 are still less than 3,000 vtpm and it would be expected that this would still result in an excellent operational LoS for the roundabout.

The New England Highway / Wollombi Road multi-lane T-intersections will not require an analysis as the increase in traffic from Urban Release Area development and its subsequent impact on this intersection has been analysed and factored into the Section 94 Plan contributions for the upgrade of the intersection. The intersection upgrade is to be in place prior to the release of the 151st lot in the URA (estimated 2019/20). Until such time as this intersection is upgraded there are several routes motorists could take to access the New England Highway should access at Wollombi Road become too difficult. This includes use of Green Street, South Street and Telarah Street to access the New England Highway at the Maitland Hospital roundabout and use of Regiment Road to access the New England Highway at Rutherford. Distribution of development traffic through these

alternative routes would be sufficient to ensure the New England Highway / Wollombi Road intersection can be upgraded as planned within the S94 Contributions Plan.

The additional traffic on Harlington Avenue from the MHE development access will be in the order of 112 vph whilst the maximum likely traffic from the residential development onto Harlington Avenue adjoining the MHE at access is in the order of 100 vph. Traffic volumes at the site access would therefore fall within the thresholds for uninterrupted flow conditions at an intersection as shown in the table sourced from Austroads *Guide to Traffic Management – Part 6 – Intersections, Interchanges & Crossings (2009)* for which the guide states a detailed analysis to demonstrate adequate capacity is available is unlikely to be necessary as uninterrupted flow conditions would prevail.

Major road type ¹	Major road flow (vph) ²	Minor road flow (vph) ³
Two-lane	400	250
	500	200
	650	100
Four-lane	1000	100
	1500	50
	2000	25

Notes:

1. Major road is through road (i.e. has priority).
2. Major road flow includes all major road traffic with priority over minor road traffic.
3. Minor road design volumes include through and turning volumes.

Source: - Austroads *Guide to Traffic Management – Part 6 – Intersections, Interchanges & Crossings (2009)*

Traffic on Harlington Avenue north of the MHE development access will range between 200 vph and 500 vph whilst any of the adjoining intersections on Harlington Road south of Wollombi Road would have a likely maximum of 100 vph and therefore would also fall within the thresholds for uninterrupted flow conditions at an intersection as shown in the table sourced from Austroads *Guide to Traffic Management – Part 6 – Intersections, Interchanges & Crossings (2009)* for which the guide states a detailed analysis to demonstrate adequate capacity is available is unlikely to be necessary as uninterrupted flow conditions would prevail.

It is therefore considered reasonable to conclude the proposed development access intersection, intersections with Harlington Avenue north of the development and the wider network intersections will perform adequately following the development.

Overall it is concluded that the proposed MHE will not adversely impact on the local road and state road network adjoining the site.

10.3 On-Site Car Parking

The proposed development will generate an on-site parking demand. Therefore, on-site parking in accordance with the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005* will need to be provided.

The relevant requirements within the Regulation are:

Resident Parking

1 resident parking space per dwelling site

Visitor Parking

20 visitor parking spaces for a manufactured home estate containing more than 105 sites, plus one additional space for each additional 7 sites (or part of a site) over 140

Accessible Parking

1 visitor accessible parking space per 100 sites or fraction of 100 sites

Resident and visitor parking are to be 6.1 metres x 2.5 metres while the accessible visitor car parks are to comply with Australian Standard AS2890.6-2009 Parking facilities Part 6: Off-street parking for people with disabilities.

Noting that on completion of the proposed development a total of 295 long term sites would exist within the park the following on-site parking is required to be provided:

- ◆ Resident Parking – 295 car spaces.
- ◆ Visitor Car Parking – $20 + (295 - 140) / 7 = 50$ car spaces.
- ◆ Accessible Visitor Car Parking / 100 = 4 car parks (within the 50 visitor car parks to be provided)

The development plans are at the time of writing not detailed enough to show visitor car parking on the site. The home sites are large enough to provide a single space within an attached small garage or car port with the dwelling while there is sufficient room on site to provide 50 visitor car parks including 4 accessible spaces. Therefore, a suitable condition of consent could be provided, and the detailed plans reviewed to ensure consent compliance at Construction Certificate stage.

10.4 Access

The main access to the site and to individual sites within the development boundaries will need to meet the requirements of the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005* as well as Australian Standard AS2890.1-2004 *Parking facilities Part 1: Off-street car parking*. In regard to the regulation the important requirements and an assessment of compliance are:

- ◆ A dwelling site must have access to an access road;
- ◆ A road that forms an entrance to or exit from a manufactured home estate must be at least 8 metres wide.
- ◆ In the case of a divided road, the width of the sealed portion of the road on either side of the median strip must be at least 5 metres.
- ◆ The arrangement for the width of an entrance or exit road to taper into or meet the width of the sealed portion of the access roads leading to the entrance or exit may be specified in the approval for the manufactured home estate.

The width of the road reserve must be:

- ◆ at least 8.5 metres for a major access road, and
- ◆ at least 6 metres for a minor access road.

The width of the sealed portion of an access road must be:

- ◆ at least 6 metres for a major access road, and
- ◆ at least 4 metres for a minor access road.

If a minor access road exceeds 80 metres in length, a passing bay or bays must be provided within the road reserve. Passing bays must be provided at intervals of not more than 100 metres.

The width of the sealed portion of an access road at any point at which there is a passing or parking bay must be:

- ◆ at least 8.5 metres for a major access road, and
- ◆ at least 6 metres for a minor access road.

A review of the plans show that major internal access roads are 8 metres wide while the minor access roads are between 4 and 6 metres wide and less than 80 metres in length ensuring compliance with the regulations without the need for passing bays. It is intended these roads be sealed as required by the regulations. Whilst there is no detail on the plans for the vehicular access crossing to Wollombi Road there is no constraint to the requirements of the regulations being met i.e. minimum width 8 metres and it would be expected a suitable condition of consent could be provided to ensure compliance with the regulation.

Sight distance along Harlington Avenue at the approaches to the proposed access have been observed at being in excess of Australian Standards AS2890.1-2004 requirements for vehicle sight lines of 45 metres for a 50 km/h speed zone as well as Austroads Guide to Road Design Part 4A requirements for safe intersection sight distance of 100 metres for a 50 km/h design speed. Therefore, the proposed site access location is considered suitable however sight distance should be confirmed at detail design stage.

Waste collection will be via private contractor with the site access allowing a suitable collection vehicle to enter in a forward and manoeuvre around the site to pick up from the waste collection areas and exit the site in a forward direction to the public road network.

Overall it is considered the proposed site access would comply with the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005* and Australian Standard *AS2890.1-2004 Parking facilities Part 1: Off-street car parking* and Austroads *Guide to Road Design Part 4A – Unsignalised and signalised intersections (2010)*.



10.5 Alternate Transport Modes

The development site is currently not well serviced by public transport services with the nearest bus stops not being within convenient walking distance of the site. The proposal and the adjoining residential areas will generate additional public transport demand and as a result the new residential development has been designed to cater for an extension of existing services with new bus stops on Wollombi Road approximately 350 metres from the site. It is also understood Harlington Avenue has been designed as a future bus route and extension of the bus service to the MHE in the future could occur. The developer has advised they would be willing to fund a bus stop and shelter near the entrance to the MHE should the bus service be extended this far. Therefore, the provision of additional public transport infrastructure within or adjacent to the proposed development will be as required by Council and the local bus provider Hunter Valley Buses.

The development is not anticipated to generate significant pedestrian or bicycle traffic on Wollombi Road or Harlington Road. The proposed footpaths being constructed in the adjoining residential

subdivision north of the MHE development is considered suitable for use by pedestrians and the footpaths and sealed road surface on Harlington Avenue and Wollombi Road are suitable for the small number of cyclists from the development.

11. CONCLUSIONS

This traffic impact assessment for the proposed Manufactured Home Estate on Lots 100 & 101 in DP 1230313 - 207 Wollombi Road, Farley has determined the following;

- ◆ As existing traffic volumes on the local road network are less than the technical mid-block two-way capacities of the road there is spare capacity to cater for the additional traffic generated by this development;
- ◆ The proposed development is predicted to generate approximately an additional 140 vph on the local road network during the critical AM and PM peak hour periods;
- ◆ The additional traffic generated by the development will not cause Wollombi Road to reach its technical mid-block two-way capacity therefore the local road network has sufficient spare capacity to cater for the development.
- ◆ The additional traffic generated by the development will not adversely impact on the operation of external road network intersections as traffic is further distributed through the road network.
- ◆ Payment of suitable S94 developer contributions would meet the needs generated by the development.
- ◆ Subject to the site providing 50 visitor car spaces including 4 accessible spaces the proposed development provides sufficient and suitable on-site car parking provision to meet the likely peak parking demand generated by the development and satisfy the requirements of the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005*.
- ◆ The development will provide a new combined entry / exit access designed to meet the requirements for access under the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005 and Australian Standard AS2890.1-2004 Part 1 Parking facilities - Off-street car parking*.
- ◆ The widths of the access roads (internal) are also in accordance with the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005*.
- ◆ The additional demand generated by the development for alternate transport modes such as public transport, walking and cycling is considered to be low. However, the developer is willing to provide a bus stop at the entrance to the MHE to accommodate an extended bus service to the site should demand for public transport in the area reach a level that warrants the extension of the bus service.
- ◆ There is no nexus for the development to provide additional external pedestrian and bicycle infrastructure noting suitable infrastructure will be provided as the Farley URA further develops.

12. RECOMMENDATION

Having undertaken this preliminary traffic assessment of the proposed Manufactured Home Estate on Lots 100 & 101 in DP 1230313 - 207 Wollombi Road, Farley it is recommended that the proposal can be supported from a traffic impact perspective as the development will not have an adverse impact on the local road network and will comply with all the requirements of Maitland City Council, *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005*, and Australian Standards.



JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

APPENDIX 1

DEVELOPMENT PLANS

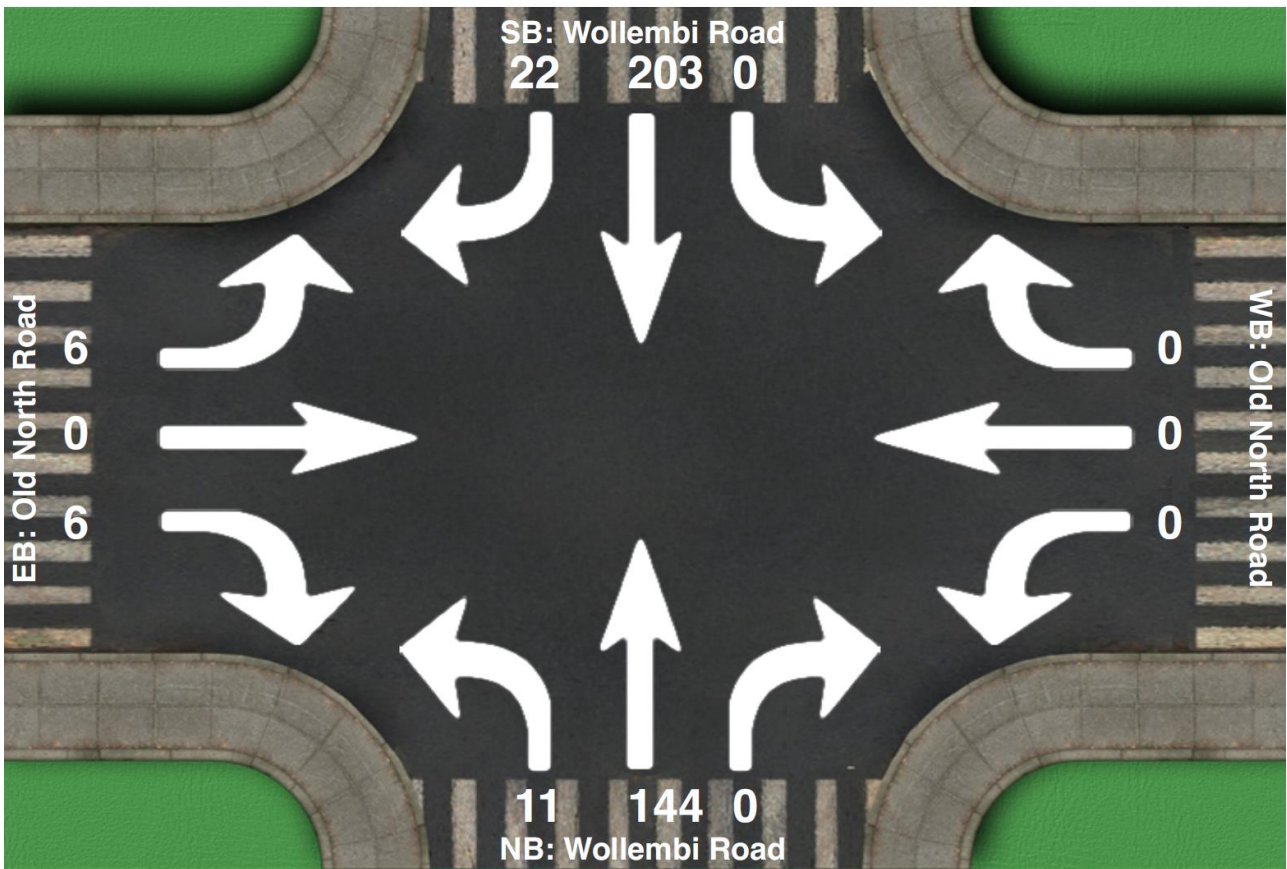


APPENDIX 2

MANUAL TRAFFIC COUNT SHEETS

Intersection Peak Hour

Location: Wollombi Road at Old North Road, Farley
GPS Coordinates:
Date: 2018-10-17
Day of week: Wednesday
Weather: Rain
Analyst: Jeff



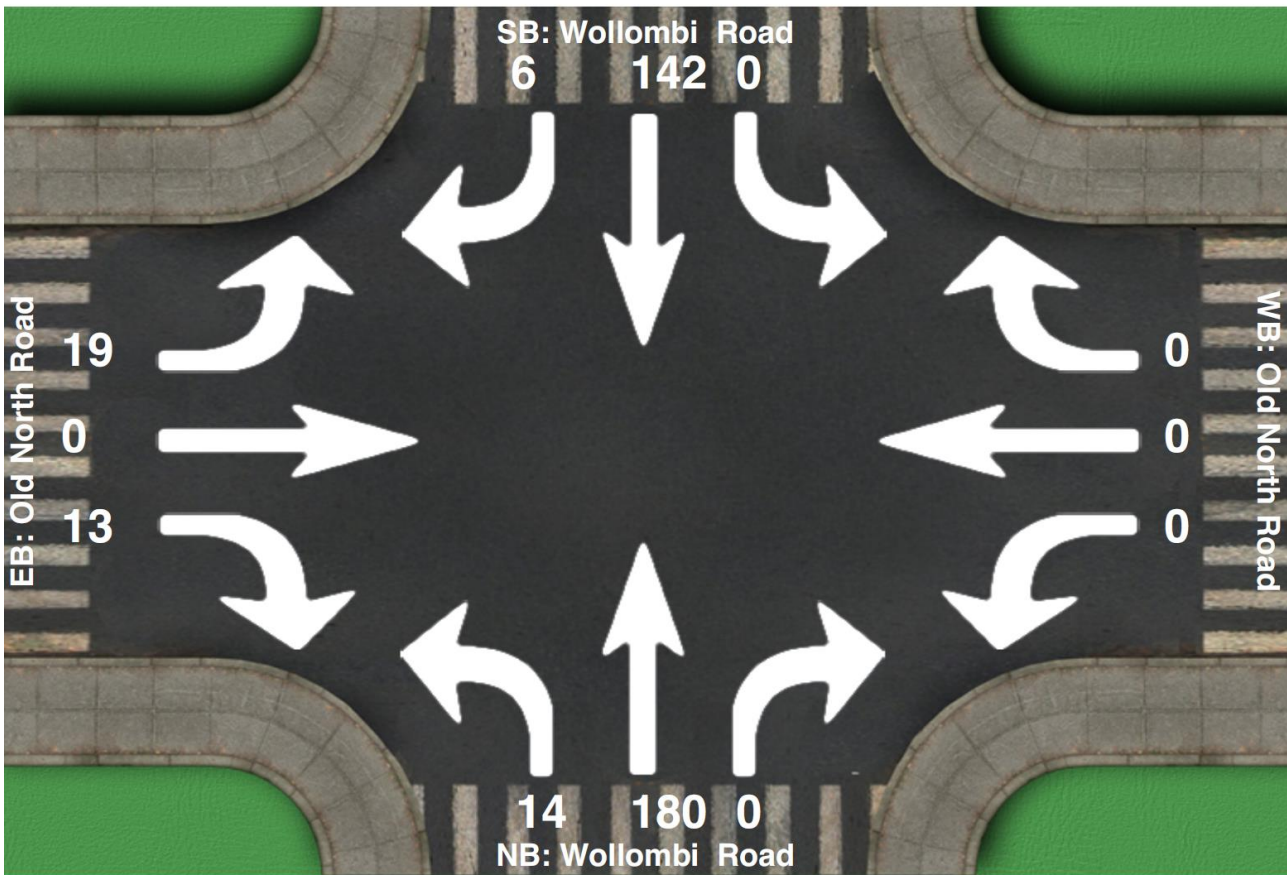
Intersection Peak Hour

16:15 - 17:15

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	203	22	0	0	0	11	144	0	6	0	6	392
Factor	0.00	0.82	0.55	0.00	0.00	0.00	0.55	0.88	0.00	0.38	0.00	0.50	0.88
Approach Factor	0.83			0.00			0.90			0.60			

Intersection Peak Hour

Location: Wollombi Road at Old North Road, Farley
 GPS Coordinates: Lat=-32.760482, Lon=151.576763
 Date: 2018-10-18
 Day of week: Thursday
 Weather:
 Analyst: Jeff



Intersection Peak Hour

08:00 - 09:00

	SouthBound			Westbound			Northbound			Eastbound			Total
	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	
Vehicle Total	0	142	6	0	0	0	14	180	0	19	0	13	374
Factor	0.00	0.91	0.75	0.00	0.00	0.00	0.70	0.96	0.00	0.59	0.00	0.46	0.89
Approach Factor	0.90			0.00			0.93			0.67			

APPENDIX 3

COMMUNITY GUIDE TO DEVELOPMENT IMPACT ANALYSIS

Land Use	Base Unit	AM Peak	ADT	ADT Range
Residential				
Single Family Home	per dwelling unit	.75	9.55	4.31-21.85
Apartment Building	per dwelling unit	.41	6.63	2.00-11.81
Condo/TownHome	per dwelling unit	.44	10.71	1.83-11.79
Retirement Community	per dwelling unit	.29	5.86	
Mobile Home Park	per dwelling unit	.43	4.81	2.29-10.42
Recreational Home	per dwelling unit	.30	3.16	3.00-3.24
Retail				
Shopping Center	per 1,000 GLA	1.03	42.92	12.5-270.8
Discount Club	per 1,000 GFA	65	41.8	25.4-78.02
Restaurant				
(High-turnover)	per 1,000 GFA	9.27	130.34	73.5-246.0
Convenience Mart w/ Gas Pumps	per 1,000 GFA		845.60	578.52-1084.72
Convenience Market (24-hour)	per 1,000 GFA	65.3	737.99	330.0-1438.0
Specialty Retail	per 1,000 GFA	6.41	40.67	21.3-50.9
Office				
Business Park	per employee	.45	4.04	3.25-8.19
General Office Bldg	per employee	.48	3.32	1.59-7.28
R & D Center	per employee	.43	2.77	.96-10.63
Medical-Dental	per 1,000 GFA	3.6	36.13	23.16-50.51
Industrial				
Industrial Park	per employee	.43	3.34	1.24-8.8
Manufacturing	per employee	.39	2.10	.60-6.66
Warehousing	1,000 GFA	.55	3.89	1.47-15.71
Other				
Service Station	per pump	12.8	168.56	73.0-306.0
City Park	per acre	1.59	NA	NA
County Park	per acre	.52	2.28	17-53.4
State Park	per acre	.02	.61	.10-2.94
Movie Theatre	per movie screen	89.48	529.47	143.5-171.5
w/Matinee	Saturday	(PM Peak)		
Day Care Center	per 1,000 GFA	13.5	79.26	57.17-126.07

Source: Institute of Transportation Engineers (ITE). Trip Generation.

How do we account for “pass-by” trips?

Typical trip generation rates are derived from counts taken at the driveways of the various land uses. For many land uses, not all of the trips generated at the driveway represent new trips added to the roadways. This is due to “pass-by” trips. Pass-by trips are made by traffic already using the adjacent roadway and enter the site as an intermediate stop on the way from another destination. The trip may not necessarily be “generated” by the land use under study, and thus, not a new trip added to the transportation system. This pass-by factor should be taken into account in devising a trip generation estimate.

The percentage of pass-by trips varies by land use. The Institute of Transportation Engineers recommends the adjustments for pass-by trips included in Table 3.4. For example, “standard trip generation rates indicate that a 300,000 square foot shopping center would generate approximately 1,320 PM peak hour trips at its driveways. Given the above pass-by percentage of 25 percent, the amount of additional traffic on the adjacent roadway system would be approximately 990 trips ((1,320 X (1 - .25)). Note that the full 1,320 trips should be shown (and analyzed) at the site driveways—the pass-by reduction will only affect the amount of traffic at to non-driveway

Land Use	Base Unit	AM Peak	ADT	ADT Range
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Single Family Home	per dwelling unit	.75	9.55	4.31-21.85
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