



TRAFFIC IMPACT ASSESSMENT

LIFESTYLE VILLAGE – MANUFACTURED HOME ESTATE

**LOTS 10, 11 & 12 DP 1197316
35 – 39 METFORD ROAD, TENAMBIT**

PREPARED FOR: METFORD ROAD PTY LTD

AMENDED NOVEMBER 2021

REF: 21/221

**TRAFFIC IMPACT ASSESSMENT
LIFESTYLE VILLAGE – MANUFACTURED HOME ESTATE
METFORD ROAD PTY LTD****LOTS 10, 11 & 12 DP 1197316,
35 – 39 METFORD ROAD, TENAMBIT**

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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.

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This document has been authorised by

Date 16th November 2021**Disclaimer**

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1. INTRODUCTION

Intersect Traffic Pty Ltd (Intersect Traffic) was engaged by Metford Road Pty Ltd to prepare a traffic impact assessment for a Lifestyle Village Manufactured Home Estate on Lots 10, 11 & 12 DP 1197316, 35 – 39 Metford Road, Tenambit. The estate will be used predominantly for permanent housing for residents over the age of fifty (50) however approval is not being sought under the Seniors Living SEPP. The proposed development plans are provided within **Appendix 1**. A 226 site Lifestyle Village has already been approved on the site and this approved development has been commenced with the site access and some internal roads and dwellings having been constructed. The previous traffic assessment has been updated based on an expanded development site yielding up to 298 sites.

The aim of this assessment is to determine the likely 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 officer's 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 and 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 particular 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 Metford Road Pty Ltd.

2. SITE LOCATION

The subject site is located on the eastern side of Metford Road approximately 1.3 km south west of the township of Morpeth in the Hunter Valley. **Figure 1** below shows the location of the site.

The site is titled as Lots 10, 11 & 12 DP 1197316 and addressed as 35 - 39 Metford Road Tenambit. It has an area of approximately 15.5 ha and is zoned RU2 – Rural Landscape under the provisions of the Maitland City Council LEP (2011). The site is currently being developed as a Lifestyle Village under a current Development Approval for a Lifestyle Village.

Access to the site is currently via an at-grade intersection with median separated entry and exit lanes directly off Metford Road which equates to a Category 5 access facility under *Australian Standard AS2890.1-2004 Parking facilities – Part 1 Off-street car parking*.

The main residential area of Tenambit lies to the southwest of the site while the village of Morpeth is north of the site. Local services and retail shops are provided in Morpeth (1.5 km north east of the site), Tenambit (1.8 km south west), Greenhills (4.1 km south west of the site) and East Maitland (3.4 km south west of the site).



Figure 1 – Site Location Plan

3. EXISTING ROAD NETWORK

3.1 Metford Road

Metford 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. A 60 km/h speed limit applies to this section of the road though it changes to a 70 kph speed zone at the approach to Butchers Lane immediately north of the site. Under a functional road hierarchy Metford Road performs the function of a local collector road collecting and distributing traffic to the higher order function roads at Morpeth (Morpeth Road) and Metford (Raymond Terrace Road and the New England Highway). 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 mainly a rural type of construction in the vicinity of the site with no formed footpaths, limited street lighting and grass verges. To the north of the site Metford Road intersects with Butchers Lane and Canterbury Drive which are local roads servicing the Water Treatment Works to the east and the residential area of Morpeth Manor and Tenambit to the west.



Photograph 1 – Metford Road in the vicinity of the site

4. ROAD NETWORK IMPROVEMENTS

There are no known road network improvements currently programmed that will increase the capacity of the local road network. Maintenance and reconstruction works 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 1 hour manual traffic counts at the intersection of Metford Road and Canterbury Drive on Tuesday 9th August 2016 between 8.00 am and 9.00 am and 4.00 pm to 5.00 pm i.e. expected AM & PM peak traffic periods to determine existing traffic volumes on the road network over the frontage of the development site during peak periods to assist in assessment of the traffic impacts of the development.

The 2016 AM and PM mid-block peak hour traffic volumes on Metford Road at the site location were:

- ◆ Metford Road AM – 483 vph; and
- ◆ Metford Road PM – 499 vph.

By assuming a 2% per annum background traffic growth rate these 2016 volumes would equate to 2021 and 2031 traffic volumes as shown below;

- ◆ Metford Road AM – 530 vph (2021) & 650 vph (2031); and
- ◆ Metford Road PM – 550 vph (2021) & 670 vph (2031).

These peak hour traffic volumes have been adopted in this assessment while the tally sheets for the manual traffic counts are provided within **Appendix 2**.

The background traffic growth 2% per annum is considered appropriate as it represents 0.5% per annum above the average background traffic growth rate in the lower Hunter (1.5% pa) and allows for some development in the Morpeth area and is considered conservative given 2016 traffic volumes are being used for assessment.

6. ROAD CAPACITIES

The capacity of roads is generally determined by the capacity of intersections on the road link. However, Tables 4.3 & 4.4 of the RMS *Guide to Traffic Generating Developments* provide some guidance on mid block capacities for urban roads. As the speed limit on the local road network is 60 km/h it is considered an urban road environment. 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

Based on these tables and adopting a LoS C as being satisfactory it is considered Metford Road has a technical mid block capacity of up to 1,800 vph.

As the current peak traffic volumes on Metford Road, as identified in **Section 5** above is less than the technical mid block capacities determined above it is concluded the local road network has significant spare capacity to cater for additional traffic generated by the proposal subject to satisfactory intersection performance.

7. ALTERNATE TRANSPORT MODES

Hunter Valley Coaches runs services in proximity to the site. Route 184 (East Maitland to Morpeth) stops at the intersection of Metford Road and Canterbury Drive while Route 183 passes near the site along O’Hearn Street and Thursby Street (see **Figure 2** below). The nearest bus stops are located on Metford Road at the Canterbury Drive intersection and on Thursby Street near Ribee Street, Tenambit within reasonable walking distance (550 metres and 400 metres) from the development. Note the existing approved development has provided a bus bay with pedestrian access to the site out the front of the development to allow the existing bus services to be extended to the site should demand for the service increase in the future (See **Photograph 2** below).

The site location is on the fringe of the Tenambit urban area and hence there are no constructed footpaths in the vicinity of the site that would be of benefit to potential pedestrian traffic generated by the development and that could be linked to the development. Pedestrians would need to utilise the existing road shoulder and verges where possible. During site inspections and traffic counts no pedestrian traffic was observed in the area.

There are existing sealed road shoulders along Metford Road in the vicinity of the site that are suitable for use by cyclists. During site inspections and traffic counts no cyclist traffic was observed in the area.

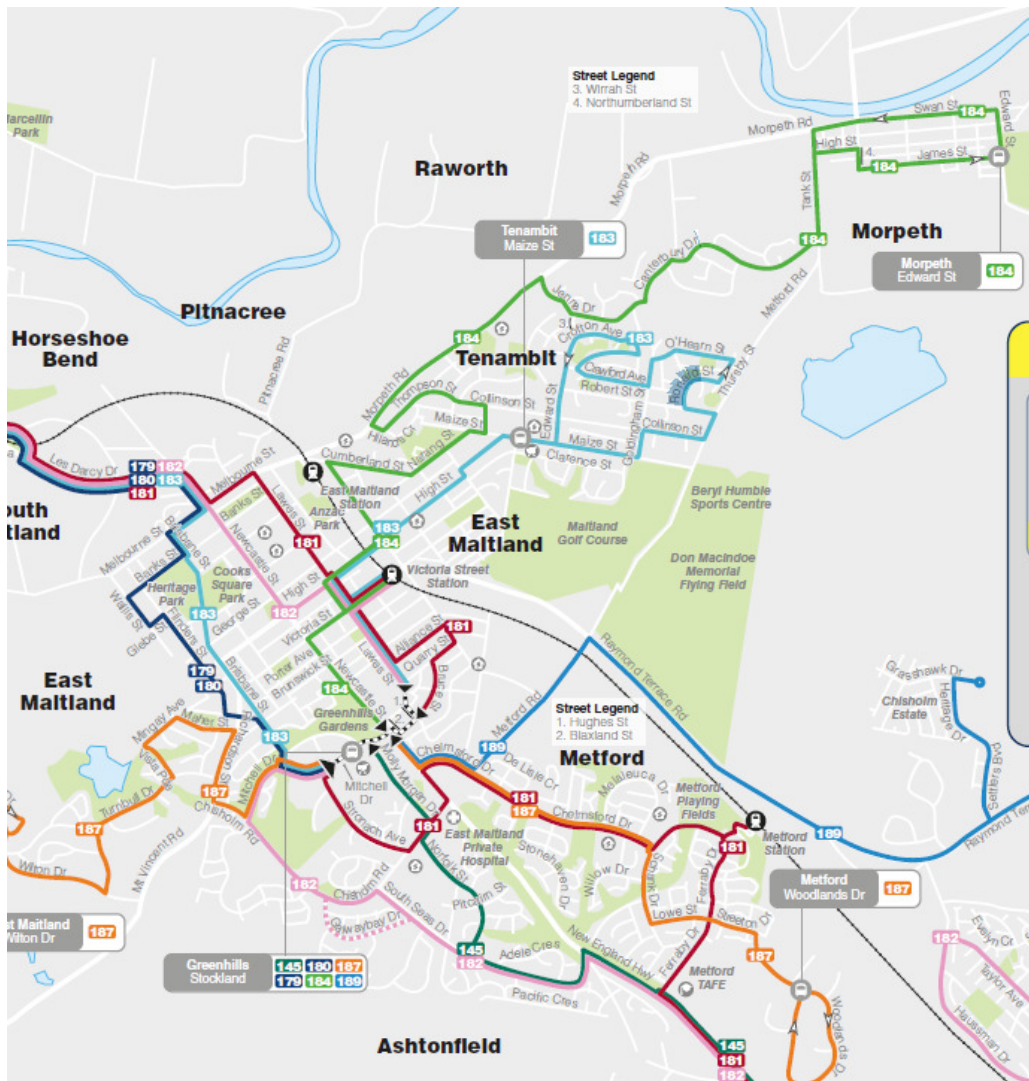


Figure 2 – Bus Route Map



Photograph 2 – Bus Stop in front of the site.

8. PROPOSED DEVELOPMENT

The proposal 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. Renovation of the existing dwellings on the site to provide a Community Centre including a tennis court and pool, Manager's Residence and Men's Shed;
2. The provision of 298 manufactured home sites and associated internal roads;
3. Use of the new combined entry / exit driveway at grade give way intersection to the site;
4. Removal of all the existing vehicular access crossings to the site;
5. Internal visitor car parking areas;
6. Stormwater drainage infrastructure including a detention basin; and
7. Landscape buffer to Metford Road.

This assessment considers the traffic related impacts associated with the full development of the site.

9. TRAFFIC GENERATION

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

The closest development type in the RTA'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 1** below:

Table 1 – 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 RTA 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 298 additional sites is calculated as follows:

$$\begin{aligned} \text{Peak hour trips} &= 298 \times 0.4 \text{ vtp} \\ &= \mathbf{120 \text{ vtp}} \end{aligned}$$

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 a number of 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 peak 50 % of traffic will exit the site and 50 % will enter the site;
- ◆ 50 % of the generated traffic will arrive and depart via Metford Road north and 50 % will arrive and depart via Metford Road south;

The resulting development PM peak hour traffic trip distribution is shown in **Figure 3** below.

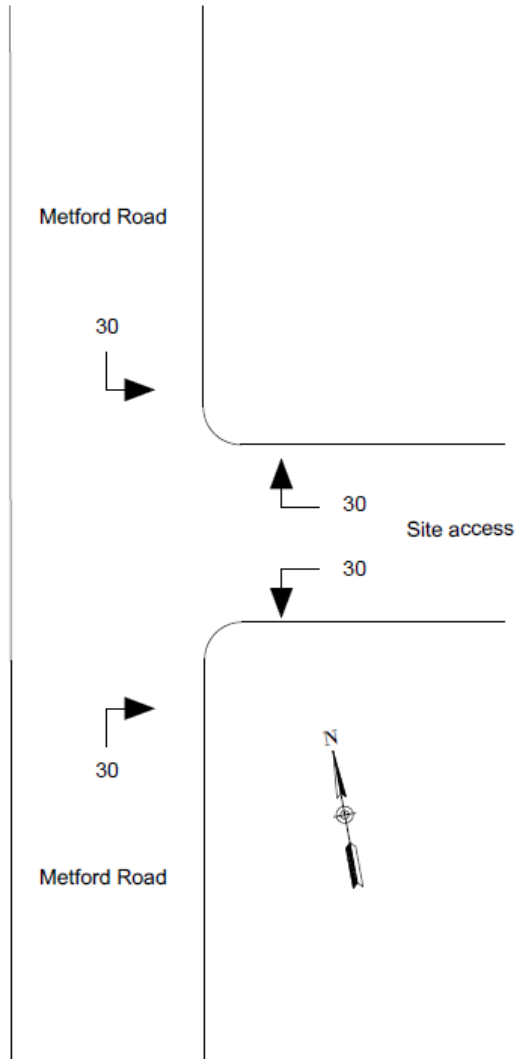


Figure 3 – Development Traffic PM Peak Hour Trip Distribution

10. TRAFFIC IMPACT ASSESSMENT

10.1 Road Network Capacity

This assessment has determined (**Section 6**) that the existing road network passing the site is currently operating below its technical mid-block two way capacity and has spare capacity to cater for additional traffic from the proposed development. **Section 9** of this report determined that the development is likely to generate up to 60 additional vehicle trips per peak hour on each leg of Metford Road during the critical PM peak hour traffic period. Therefore during this peak period the two way mid-block traffic volumes (2021) on Metford Road are estimated to increase to 610 vtpm in the PM peak post development and with background traffic growth would be expected to further increase to 730 vtpm in 2031.

These predicted post development and future traffic volumes on Metford Road are still well below the two way mid-block road capacity for Metford Road therefore it is concluded that there is sufficient spare two way mid-block road capacity within the local road network to cater for the proposed development.

10.2 Intersection capacity

The additional traffic on each leg of Metford Road will be in the order of 60 vtpm or only 11 % of existing traffic volumes on Metford Road. This would not be expected to adversely impact on the operation of external road network intersections as traffic is further distributed through the road network particularly considering that at these busier intersections the additional traffic volumes through the intersection will be less than 10% of existing traffic volumes through these intersections.

The site access has been modelled using the SIDRA INTERSECTION software package. This 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 TfNSW shown below. The current layouts of the intersections have been adopted, without change.

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)

The modelling assumptions were;

- ◆ No changes to access intersection layout;
- ◆ For calibration the intersection was observed during peak periods to be operating almost with uninterrupted flow conditions with little if any queueing or delay;
- ◆ A background traffic growth factor of 2 % per annum has been adopted for all roads.
- ◆ Gap acceptance data complied with the minimum requirements of Australian Standards and Austroads.
- ◆ Both the AM and PM peaks were modelled.

The results of the modelling are summarised below in **Table 2** with worst delay, LoS and 95 % back of queue length provided. The full sidra Movement Summary Tables are provided in **Attachment C**.

Table 2 – Sidra results Morpeth Gardens access intersection.

Modelled Peak	Degree of Saturation (v/c)	Worst Average Delay (s)	Worst Level of Service	95% back of queue length (cars)
2021 AM	0.221	8.6	A	0.3
2021 PM	0.193	8.7	A	0.3
2031 AM + Development	0.266	9.7	A	0.3
2031 PM + Development	0.236	9.9	A	0.3

This modelling shows the access will continue to operate satisfactorily with the expanded site through to and beyond 2031 with almost uninterrupted flow conditions during peak periods. There is little if any delay to traffic accessing the site and little if any queueing occurring at the access. Queue lengths are contained within the existing right turn lane to the site and traffic flow on Metford Road is not interrupted. Levels of service at the access remain at LoS A which indicates satisfactory operation of the intersection.

It is therefore considered reasonable to conclude the existing development access will not adversely impact on the performance of the road network with the expanded development as almost uninterrupted flow conditions would exist. Therefore the existing site access remains satisfactory for use by the expanded development.

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 298 long term sites would exist within the park the following on-site parking is required to be provided:

- ◆ Resident Parking – 298 car spaces.
- ◆ Visitor Car Parking – $20 + (298 - 140) / 7 = 43$ car spaces.
- ◆ Accessible Visitor Car Parking $298/100 = 3$ car parks (within the 43 visitor car parks to be provided)

From a review of the plans it is noted a total of 61 on-site visitor car parks including 3 accessible spaces are provided with each dwelling site being large enough to contain an on-site resident park. It is therefore reasonable to conclude the proposal provides sufficient on-site car parking. Whilst the existing plans are not detailed enough to assess compliance with the regulations in regard to the size of the parking modules it is considered there is enough room on the site to guarantee compliance with the regulations. 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.

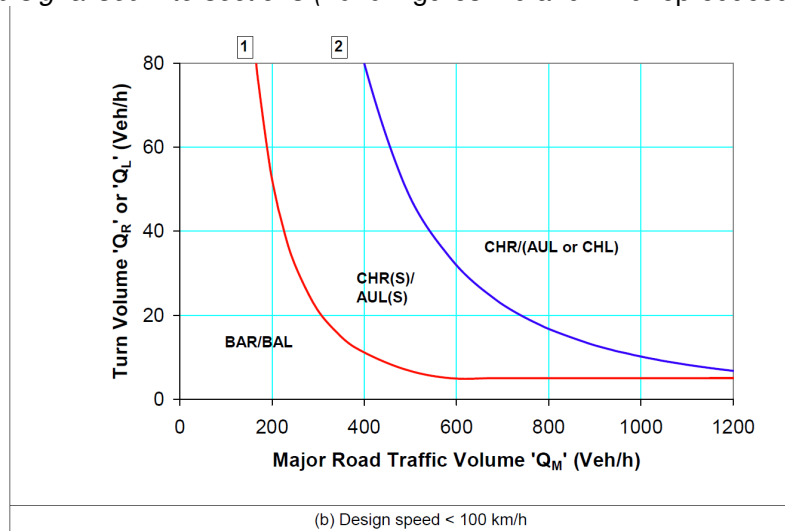
A review of the plans show that major internal access roads are 8 metres wide while the minor access roads are between 4 and 6 metres wide and less than 80 metres in length ensuring

compliance with the regulations without the need for passing bays. It is intended these roads be sealed as required by the regulations. The provision of an at-grade intersection access with median separated entry and exit lanes is compliant with the regulations and has previously been approved by Council for the current Lifestyle Village approval. It is reasonable to conclude that the existing access being of a higher than required standard would still be suitable for the enlarged Village.

Sight distance along Metford Road at the approaches to the access have been observed at being in excess of Australian Standards AS2890.1-2004 requirements for vehicle sight lines of 85 metres for a 60 km/h speed zone as well as Austroads Guide to Road Design Part 4A requirements for safe intersection sight distance of 125 metres for a 60 km/h design speed. As the existing access has been previously approved by Council it is reasonable to conclude intersection sight distance at the access comply with Australian Standard requirements and the access is suitably safe for use by the development.

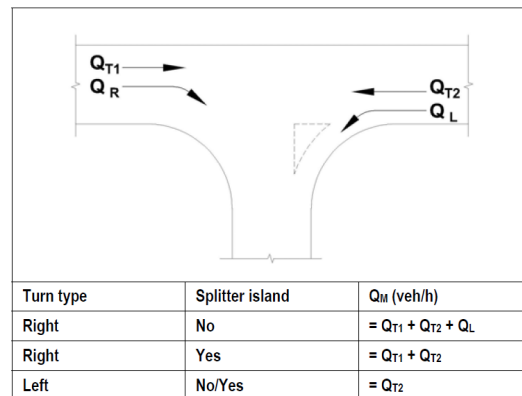
Overall it is considered the proposed site access would comply with the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005* and Australian Standard AS2890.1-2004 *Parking facilities Part 1: Off-street car parking and Austroads Guide to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

Determination of the requirement for protected turning bays at the site entrance requires a turn lane warrant assessment in accordance with *Austroads Guide to Road Design Part 4A – Unsignalised and signalised intersections (2010)* Figures 4.9 and 4.10 reproduced below.



Source: Amdt and Troutbeck (2006).

Figure 4.9: Warrants for turn treatments on the major road at unsignalised intersections



2006).

Figure 4.10: Calculation of the major road traffic volume parameter Q_M

Noting the various parameters for assessment are as follows based on **Figure 3** and the traffic count sheets in **Appendix 2**;

Right Turn

$$Q_R = 30 \text{ vtp}, Q_M = 550 + 30 = 580 \text{ vtp}.$$

Left Turn

$$Q_L = 23 \text{ vtp}; Q_M = 188 \text{ vtp}$$

From Graph B of Figure 4.9 of Austroads Part 4A the required access intersection is a CHR (s) / BAL intersection. The existing access is already constructed to this standard therefore is considered suitable for the expanded development.

10.5 Alternate Transport Modes

The development site is currently well serviced by public transport services with bus stops being within convenient walking distance of the site and provision made in the constructed part of the development for extension of the existing services to the site. Further the development currently runs its own minibus shuttle from the site to all nearby retail, medical and business facilities for the use of residents. This will continue to run to at least when the public transport service is extended to the site.

The development is not anticipated to generate significant pedestrian or bicycle traffic on Metford Road. The existing grass road verge is considered suitable for use by pedestrians and there is a sealed road shoulder on both sides of Metford Road for cyclists over the frontage of the development.



Photograph 3 – Existing Site Access – Metford Road.

11. CONCLUSIONS

This preliminary traffic assessment for the proposed Lifestyle Village - manufactured home estate on Lots 10, 11 & 12 DP 1197316, 35 – 39 Metford Road, Tenambit 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 120 vtpk on the local road network during the critical PM peak hour period;
- ◆ The additional traffic generated by the development will not cause Metford 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 would not be expected to adversely impact on the operation of external road network intersections as traffic is further distributed through the road network particularly considering that at these busier intersections the additional traffic volumes through the intersection will be less than 10% of existing traffic volumes.
- ◆ SIDRA INTERSECTION modelling of the site access has shown that it will continue to operate satisfactorily during peak traffic periods through to and beyond 2031 with the expanded development proposed on the site i.e. 298 sites..
- ◆ 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 existing site access to the development complies with the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005* and Austroad requirements therefore would be suitable for use with the expanded development.
- ◆ 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*.
- ◆ Sight distance along Metford Road at the approaches to the site access have been observed as being in excess of Australian Standards AS2890.1-2004 requirements for vehicle sight lines as well as Austroads Guide to Road Design Part 4A requirements for safe intersection sight distance therefore the proposed site access is considered suitable.
- ◆ The additional demand generated by the development for alternate transport modes such as public transport, walking and cycling is considered to be low. Therefore no nexus exists for the introduction of additional services and facilities. It is noted that Hunter Valley Buses have advised it is willing to expand its services to the site should demand reach levels that warrant the extension of the service. To that end an indented bus bay and pedestrian connection to the site has been constructed within the Metford Road frontage of the site. In the meantime the development runs its own minibus shuttle service for residents wishing to access nearby retail, medical and business facilities.

12. RECOMMENDATION

Having undertaken this traffic impact assessment of the proposed expanded Morpeth Gardens Lifestyle Village - manufactured home estate (298 sites) on Lots 10, 11 & 12 DP 1197316, 35 – 39 Metford Road, Tenambit 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.

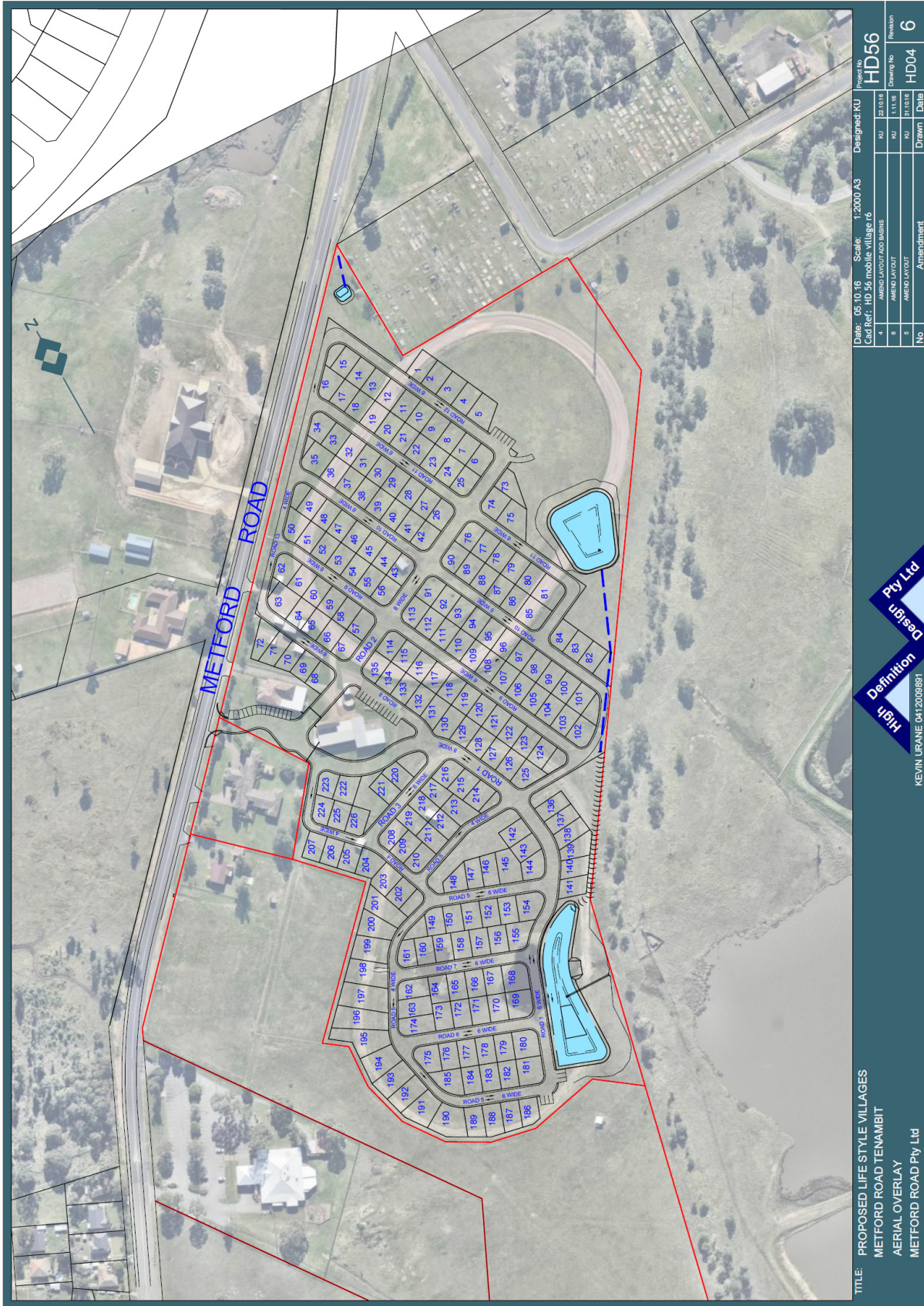


JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd



APPENDIX 1

DEVELOPMENT PLANS



TITLE: PROPOSED LIFE STYLE VILLAGES
METFORD ROAD TENAMBIT
AERIAL OVERLAY
METFORD ROAD Pty Ltd

Date: 05/10/16 Scale: 1:2000 A3
Cad Ref: HD 56 mobile village r6

Designed: KU
Drawn: KU
Date: 22/10/16


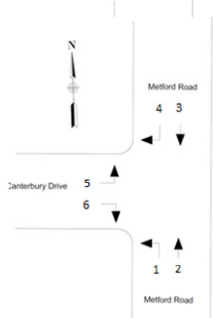
Project No: HD56
Drawing No: HD04
Revision: 6


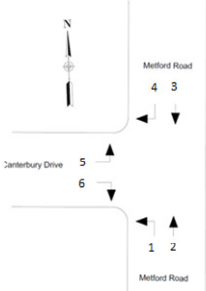
No	Amendment	Date
4	AMEND LAYOUT ADD MAINS	1/11/16
5	AMEND LAYOUT	31/03/16
6	Amendment	

High Definition Design Pty Ltd
KEVIN URANE 0412009891

APPENDIX 2

MANUAL TRAFFIC COUNT SHEETS

Date	09-08-16					
Day	Tuesday					
Time	8:00am - 9:00am					
Weather	Fine					
Conducted by:	Dale					
						
MOVEMENT	1	2	3	4	5	6
8:00 - 8:15	2	21	76	1	4	17
8:15 - 8:30	5	30	74	3	16	8
8:30 - 8:45	5	42	83	3	14	6
8:45 - 9:00	5	43	62	13	20	4
SUM	17	136	295	20	54	35
PEAK	17	136	295	20	54	35
Leg	PHT (vph)					
Metford Road South	483					
Metford Road North	540					
Canterbury Drive	126					
						

Date	09-08-16					
Day	Tuesday					
Time	4.00 pm - 5.00 pm					
Weather	Fine					
Conducted by:	Dale					
						
MOVEMENT	1	2	3	4	5	6
4:00 - 4:15	12	58	41	9	7	3
4:15 - 4:30	17	74	40	10	5	5
4:30 - 4:45	16	61	38	8	8	6
4:45 - 5:00	11	62	52	15	7	3
SUM	56	255	171	42	27	17
PEAK	56	255	171	42	27	17
Leg	PHT (vph)					
Metford Road South	499					
Metford Road North	512					
Canterbury Drive	142					
						

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
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

Appendix 4

SIDRA MOVEMENT SUMMARY TABLES

MOVEMENT SUMMARY

Site: 101 [2021 AM (Site Folder: General)]

Morpeth Gardens site access
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist] m				
South: Metford Road														
2	T1	169	5.0	178	5.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
3	R2	30	5.0	32	5.0	0.028	7.1	LOS A	0.1	0.8	0.46	0.63	0.46	51.7
Approach		199	5.0	209	5.0	0.095	1.1	NA	0.1	0.8	0.07	0.10	0.07	58.5
East: Morpeth Gardens access														
4	L2	30	5.0	32	5.0	0.065	7.1	LOS A	0.3	2.0	0.51	0.68	0.51	51.7
6	R2	30	5.0	32	5.0	0.065	8.6	LOS A	0.3	2.0	0.51	0.68	0.51	51.2
Approach		60	5.0	63	5.0	0.065	7.9	LOS A	0.3	2.0	0.51	0.68	0.51	51.4
North: Metford Road														
7	L2	30	5.0	32	5.0	0.221	5.6	LOS A	0.0	0.0	0.00	0.05	0.00	57.6
8	T1	365	5.0	384	5.0	0.221	0.1	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach		395	5.0	416	5.0	0.221	0.5	NA	0.0	0.0	0.00	0.05	0.00	59.3
All Vehicles		654	5.0	688	5.0	0.221	1.3	NA	0.3	2.0	0.07	0.12	0.07	58.3

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▼ Site: 101 [2021 PM (Site Folder: General)]

Morpeth Gardens site access
 Site Category: (None)
 Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh.]	[Dist]				
South: Metford Road														
2	T1	345	5.0	363	5.0	0.193	0.1	LOSA	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	30	5.0	32	5.0	0.023	6.3	LOSA	0.1	0.7	0.35	0.58	0.35	52.0
Approach		375	5.0	395	5.0	0.193	0.6	NA	0.1	0.7	0.03	0.05	0.03	59.2
East: Morpeth Gardens access														
4	L2	30	5.0	32	5.0	0.061	6.3	LOSA	0.3	1.9	0.42	0.63	0.42	51.9
6	R2	30	5.0	32	5.0	0.061	8.7	LOSA	0.3	1.9	0.42	0.63	0.42	51.4
Approach		60	5.0	63	5.0	0.061	7.5	LOSA	0.3	1.9	0.42	0.63	0.42	51.7
North: Metford Road														
7	L2	30	5.0	32	5.0	0.135	5.6	LOSA	0.0	0.0	0.00	0.07	0.00	57.4
8	T1	210	5.0	221	5.0	0.135	0.0	LOSA	0.0	0.0	0.00	0.07	0.00	59.3
Approach		240	5.0	253	5.0	0.135	0.7	NA	0.0	0.0	0.00	0.07	0.00	59.0
All Vehicles		675	5.0	711	5.0	0.193	1.2	NA	0.3	1.9	0.05	0.11	0.05	58.4

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.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 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 [2031 AM (Site Folder: General)]

Morpeth Gardens site access

Site Category: (None)

Give-Way (Two-Way)

Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Metford Road														
2	T1	169	5.0	217	5.0	0.115	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	30	5.0	32	5.0	0.031	7.6	LOS A	0.1	0.9	0.51	0.67	0.51	51.4
Approach		199	5.0	248	5.0	0.115	1.0	NA	0.1	0.9	0.06	0.08	0.06	58.7
East: Morpeth Gardens access														
4	L2	30	5.0	32	5.0	0.074	7.6	LOS A	0.3	2.2	0.56	0.73	0.56	51.1
6	R2	30	5.0	32	5.0	0.074	9.7	LOS A	0.3	2.2	0.56	0.73	0.56	50.6
Approach		60	5.0	63	5.0	0.074	8.6	LOS A	0.3	2.2	0.56	0.73	0.56	50.9
North: Metford Road														
7	L2	30	5.0	32	5.0	0.266	5.7	LOS A	0.0	0.0	0.00	0.04	0.00	57.7
8	T1	365	5.0	468	5.0	0.266	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	59.5
Approach		395	5.0	500	5.0	0.266	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.4
All Vehicles		654	5.0	812	5.0	0.266	1.2	NA	0.3	2.2	0.06	0.11	0.06	58.4

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.

Delay Model: SIDRA Standard (Geometric Delay is included).

Queue Model: SIDRA Standard.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

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MOVEMENT SUMMARY

▼ Site: 101 [2031 PM (Site Folder: General)]

Morpeth Gardens site access
 Site Category: (None)
 Give-Way (Two-Way)
 Design Life Analysis (Final Year): Results for 10 years

Vehicle Movement Performance														
Mov ID	Turn	INPUT VOLUMES		DEMAND FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Metford Road														
2	T1	345	5.0	443	5.0	0.236	0.1	LOSA	0.0	0.0	0.00	0.00	0.00	59.9
3	R2	30	5.0	32	5.0	0.024	6.5	LOSA	0.1	0.8	0.39	0.59	0.39	51.9
Approach		375	5.0	474	5.0	0.236	0.5	NA	0.1	0.8	0.03	0.04	0.03	59.3
East: Morpeth Gardens access														
4	L2	30	5.0	32	5.0	0.069	6.5	LOSA	0.3	2.1	0.47	0.67	0.47	51.4
6	R2	30	5.0	32	5.0	0.069	9.9	LOSA	0.3	2.1	0.47	0.67	0.47	50.9
Approach		60	5.0	63	5.0	0.069	8.2	LOSA	0.3	2.1	0.47	0.67	0.47	51.2
North: Metford Road														
7	L2	30	5.0	32	5.0	0.160	5.6	LOSA	0.0	0.0	0.00	0.06	0.00	57.5
8	T1	210	5.0	269	5.0	0.160	0.0	LOSA	0.0	0.0	0.00	0.06	0.00	59.4
Approach		240	5.0	301	5.0	0.160	0.6	NA	0.0	0.0	0.00	0.06	0.00	59.2
All Vehicles		675	5.0	838	5.0	0.236	1.1	NA	0.3	2.1	0.05	0.10	0.05	58.5

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.
 Delay Model: SIDRA Standard (Geometric Delay is included).
 Queue Model: SIDRA Standard.
 Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
 HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.