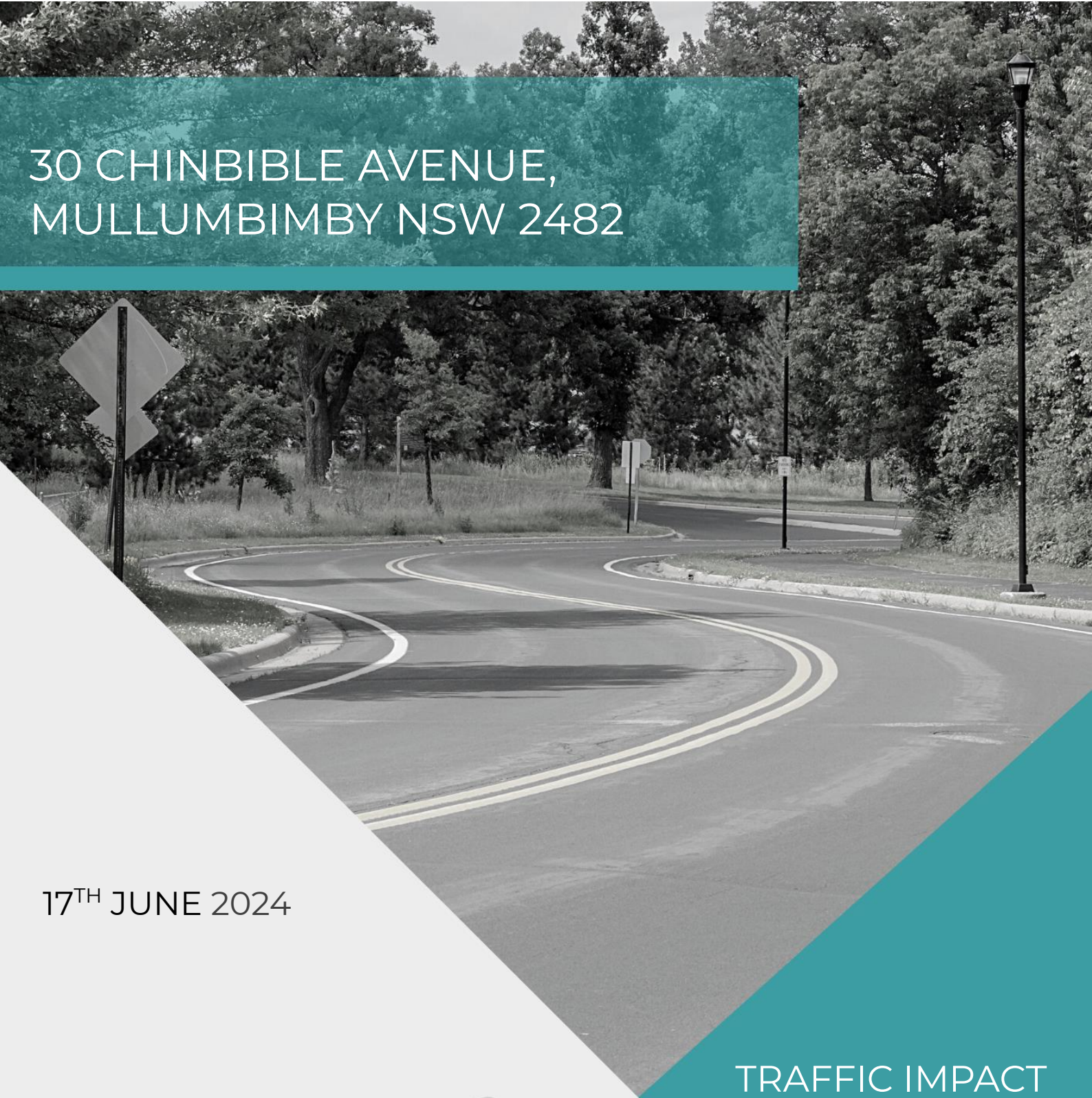

30 CHINBIBLE AVENUE, MULLUMBIMBY NSW 2482

17TH JUNE 2024

TRAFFIC IMPACT STATEMENT

INGEN CONSULTING

ENGINEERED WITH PURPOSE

DOCUMENT CONTROL

Revision number	Description	Prepared	Reviewed	Issued	Issue date
A	Client comment	MK	JN	MK	26/2/24
B	Development Application	MK	JN	MK	17/6/24

Document title: Traffic Impact Statement

Document number: J1295_TIS

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1. INTRODUCTION

Ingen Consulting P/L has been engaged by Sked No.2 Pty Ltd to prepare a Traffic Impact Statement (TIS) to accompany a Development Application with Byron Shire Council for a multi dwelling housing and strata subdivision of proposed Lot 7 under DA10.2024.151.1 at 30 Chinbible Avenue, Mullumbimby NSW 2482.

1.1. Scope

The purpose of this report is to assess the traffic impacts of the proposed development on the surrounding road network in accordance with chapter B4 of the Byron Shire Development Control Plan. This report seeks to:

- Demonstrate compliance with the requirements of Chapter B4 of the 2014 Byron Shire Development Control Plan;
- Address relevant items recommended for a Traffic Impact Study in the 2002 Guide to Traffic Generating Developments (RTA);
- Demonstrate compliance with the access and parking requirements of the AS2890 series;

This report has been prepared in accordance with the requirements for a Traffic Impact Statement as defined in clause B4.2.1 of the Byron Shire DCP. The minimum scope for this study as provided in chapter B4 of the DCP is defined as follows:

- A brief description of the development in terms of proposed land use and trips generated;
- A brief description of the existing operational conditions of the road network in the immediate vicinity of the development;
- Analysis of the operation of the accesses and parking arrangements for the development;
- Analysis of the parking demand and supply of the development;
- Analysis for the mobility impaired;
- Analysis of the operation of the first intersection, as a minimum, on either side of the accesses;
- A conceptual geometric layout of the access arrangements, including any nearby driveways and intersections; and
- Professional opinion on the expected traffic impact based on a site observation during the expected critical peak our and the analysis conducted.

This report has been prepared in accordance with the requirements for a Traffic Impact Statement as defined in clause B4.2.1 of the Byron Shire DCP, for developments generating between 10 and 50 peak hour vehicle trips.

1.2. Standards, policies and guidelines

This TIS has been prepared considering the following standards, guidelines and policies:

- Chapter B4 of the 2014 Byron Shire DCP
- Guide to Traffic Generating Developments (RTA, 2002)
- Guide to Traffic Generating Developments, Updated Surveys (RMS 2013)
- Austroads Guide to Traffic Management
- Austroads Guide to Road Design
- Australian/New Zealand Standard 2890 series
- New South Wales Development Design Specification D1 – Geometric Road Design (Urban and Rural)
- Handbook for Driveway Access to Property

1.3. Site description

The subject site is situated in Mullumbimby. Its address is at 30 Chinbible Avenue, Mullumbimby NSW 2482, with Lot/Plan number registered as Lot 159 DP 755687, and the site has an area of 12340 m^2 (measurement based on detail survey provided by Usher & Co) in total fronting Brunswick River, Chinbible Avenue and Garden Avenue, as shown in Figure 1.

The site currently contains a residential dwelling, with some sheds, two driveways, horse stables and a paddock (Figure 2).

A separate Development Application has been submitted for the torrens title subdivision of the original lot to create 6 additional torrens title lots as shown in Figure 3.

Proposed lot 7 is the subject lot of this current Development Application for a strata title subdivision.

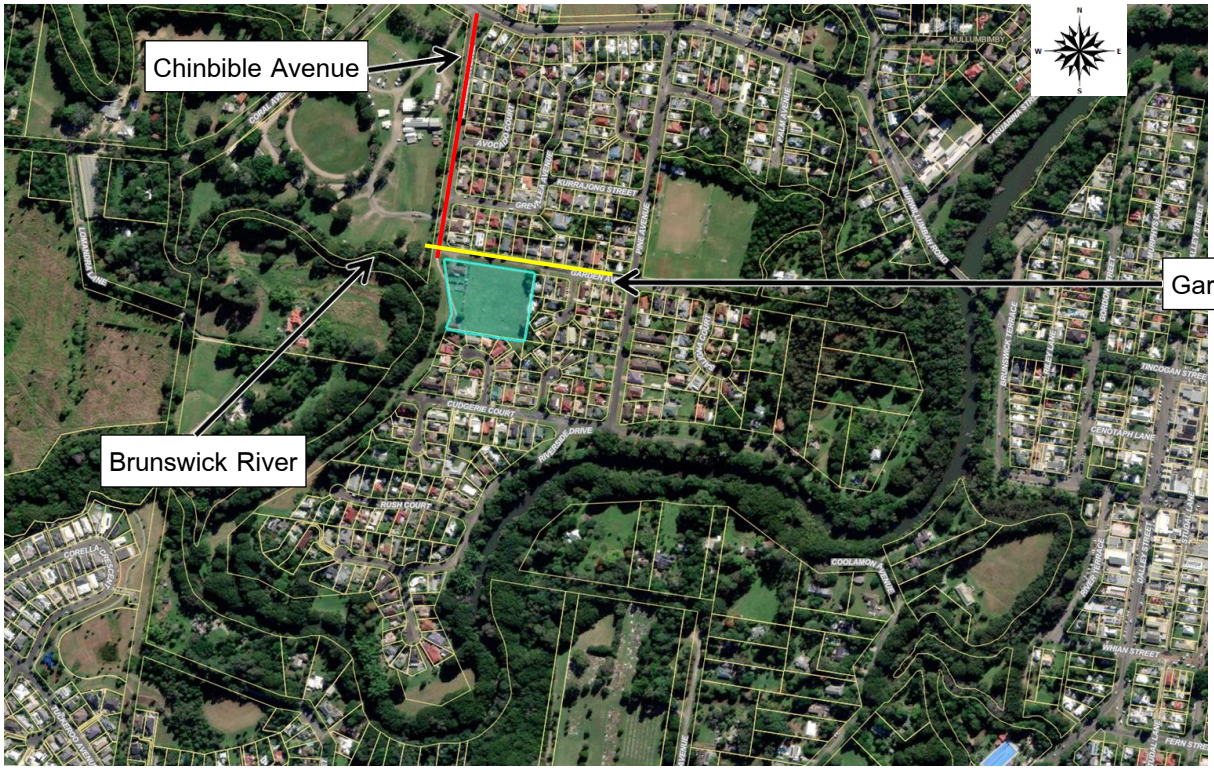


Figure 1 | Site location, *Source of the map: Byron Shire Council Online Map Tools*

Figure 2 | Subject site aerial image, *Source: Usher & Co*

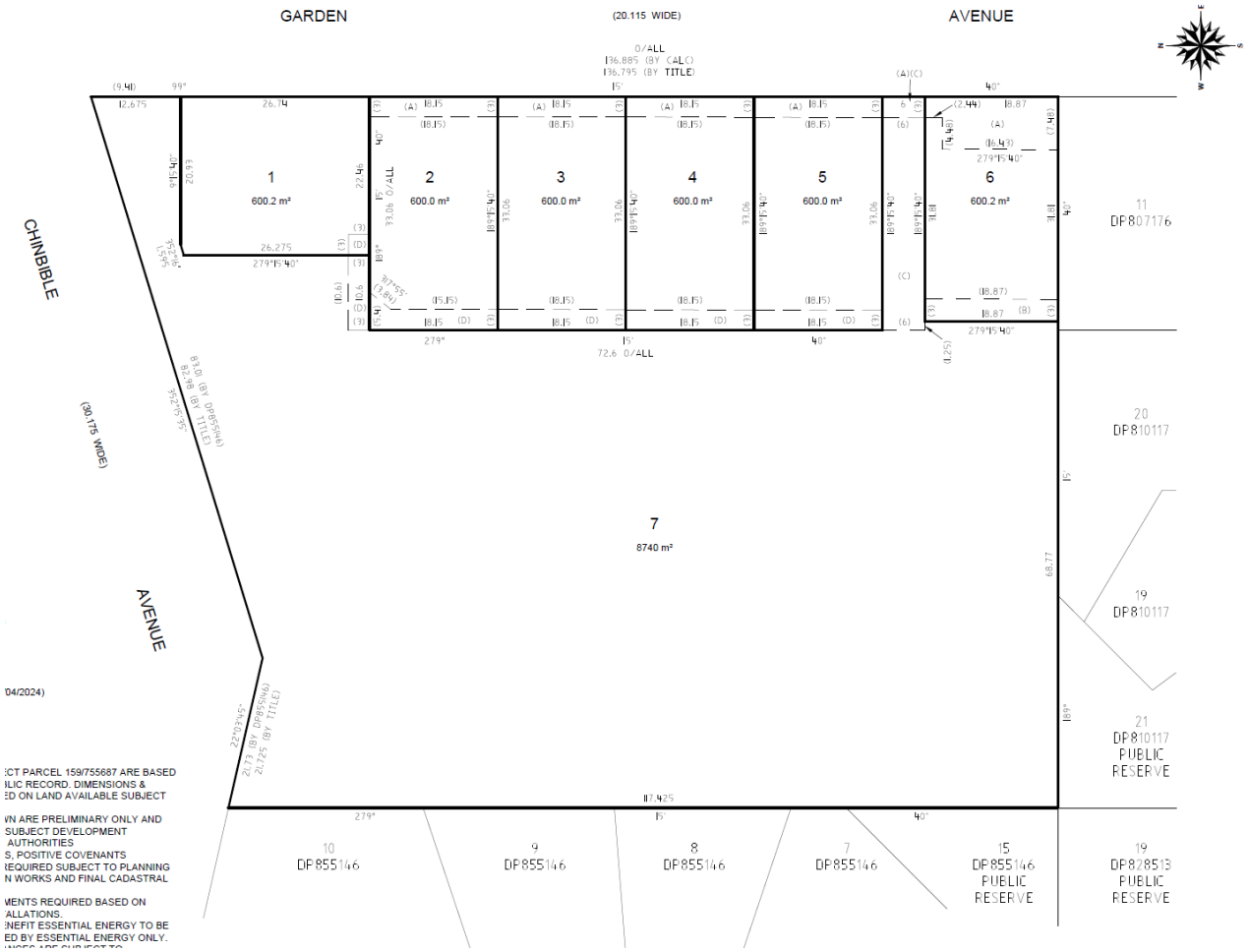


Figure 3 | Proposed Lot Layout DA10.2024.154.1, *Source: Usher & Company 2024*

1.4. Proposed development

The proposed development is the construction of multi dwelling housing comprising 25 detached townhouses and the strata subdivision of those dwellings over two stages. The proposed layout is shown in Figure 4.

It is proposed to construct an entry driveway off Garden Avenue on the eastern part of the site, and an exit driveway west of the existing dwelling, near the horizontal curve into Chinbible Avenue. The blue arrows in Figure 4 show the direction of travel. The majority of the internal road will be one way. Only a short section on the eastern side will be two-way to provide access to the four lots fronting that dead-end road section.

The development will be staged with 12 strata lots and dwellings in Stage 1 and 13 lots and dwellings in Stage 2.

Although the development is staged, the if this Traffic Impact Statement demonstrates an acceptable traffic impact for Stage 1 and Stage 2 combined, then Stage 1 by itself will also comply. The focus of this report therefore is on the combined impact of both stages on the road network.

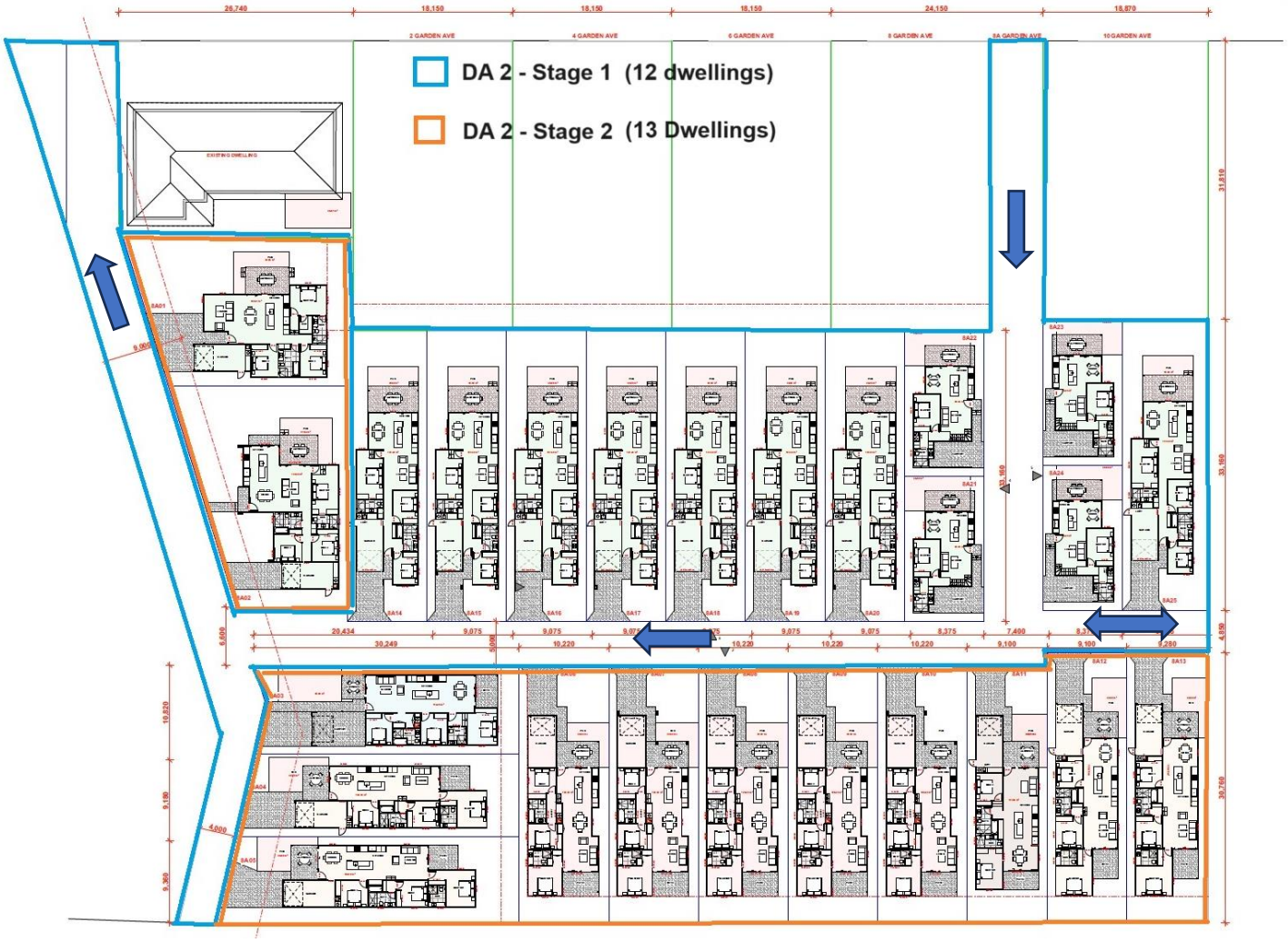


Figure 4 | Proposed development, *Source: Story Design Collective*

2. EXISTING CONDITIONS

2.1. Road network – Garden Avenue

Garden Avenue (Figure 5) is a 2-way sealed local street that connects to Chinbible Avenue in the west and Pine Avenue in the east. Along the frontage of the subject site, it has approximately 5 metres of seal width at the property frontage. Further east, where there is low-density residential use on both sides of the road, the road has been widened to approximately 7.7m between kerb inverts. Roadside drainage on the subject land side is currently by ways of a grass swale that drains to the mountable kerb further east. The road pavement shows sign of ageing with crocodile cracking and sections of pothole repair. The posted speed limit is 50 km/h.

Figure 5 | Garden Avenue

We carried out a 7-day traffic survey of Garden Avenue at the site frontage (see red line in Figure 6) and provide the survey results below. The measured 7-day ADT is 54 vpd and 85%-ile vehicle speed 42.4 km/h. The 7.3% heavy vehicle component mostly comprises school buses.

Table 1 | Garden Avenue survey data

Garden Avenue								
Dates		Sat 10/2/24	Sun 11/2/24	Mon 12/2/24	Tue 13/2/24	Wed 14/2/24	Thu 15/2/24	Fri 16/2/24
Location		125m east of Chinbible Avenue centreline						
Traffic volume		**47**	**26**	**57**	**60**	**56**	**55**	**76**
AM peak hour	Period	8:45-9:45	-	7:15-8:15	8:00-9:00	6:30-7:30	10:00-11:00	8:00-9:00
	Volume	**7**	**-**	**8**	**5**	**5**	**9**	**16**
PM peak hour	Period	12:45-13:45	12:45-13:45	14:15-15:15	16:30-17:30	12:30-13:30	14:45-15:45	15:00-16:00
	Volume	**6**	**5**	**8**	**12**	**9**	**7**	**9**
5-day ADT		**61**	AM average peak (weekday)		**8.6**	% heavy vehicles		**7.3%**
7-day ADT		**54**	PM average peak (weekday)		**9**	85%-ile speed, km/h		**42.4**

Figure 6 | Traffic survey location

2.2. Road Network – Chinbible Avenue

Chinbible Avenue is a six metre wide sealed road with mountable kerb and gutter on the eastern side along the frontage with low-density residential lots, and a grass verge with no kerb on the western side, along the Mullumbimby Showground frontage. The posted speed limit is 50 km/h and the pavement is in a similar condition as Garden Avenue: signs of ageing and pothole repair.

Figure 7 | Chinbible Avenue

2.3. Chinbible and Garden Avenue junction

The junction of Chinbible Avenue and Garden Avenue is shown in Figure 8. This junction comprises the Garden Avenue road reserve to the east, the Chinbible Avenue road reserve to the north, and to the south appears a merger of the Chinbiblbe Avenue reserve and the land dedicated to the Brunswick River.

The northern and eastern legs are a paved and sealed road (Chinbible Avenue and Garden Avenue) and to the south is gravel section leading to a driveway to the horse stables on the subject lot. This area is sometimes used for overflow parking for the Mullumbimby Showground.

At first glance, this junction has the appearance of a T-intersection, but in reality, for all intents and purposes it functions as 90^{o} turn in the road. It is not a public road T-intersection since the southern leg is not a road, and also does not have the potential to be developed into a road in the future, nor is it listed on Council's strategy to be developed as a road.

On the basis of this, for the purposes of this report, this junction is treated as a 90^{o} turn in the road, not as a T-junction.

Figure 8 | Junction of Garden Avenue and Chinbible Avenue, *Source: BSC Online Maps*

2.4. Intersection turning movement surveys

The scope of a Traffic Impact Statement under the Byron Shire Council DCP B4 requires the following:

"f) analysis of the operation of the first intersection, as a minimum, on either side of the accesses;"

The first intersection to the east of the subject site is the Garden Avenue intersection with Rosewood Court. The first intersection to the west/north of the subject site is the Chinbible Avenue intersection with Grevillea Avenue. Both these side roads are roads with little traffic and SIDRA analysis of these is unlikely to show any capacity issues. Therefore, we concluded a more worth-while analysis would be that of busier intersections on either side of the subject site, therefore we carried out turning movement surveys (with the intent of carrying out SIDRA analysis) of the Garden Avenue intersection with Pine Avenue to the east, and the Chinbible Avenue intersection with Main Arm Road to the north.

The turning movement surveys results are shown below.

Table 2 | Pine Avenue and Garden Avenue intersection survey (AM & PM)

		Thursday 15th February 2024																Friday 9th February 2024							
		07:30-07:45		07:45-08:00		08:00-08:15		08:15-08:30		08:30-08:45		08:45-09:00		09:00-09:15		09:15-09:30		15:30-15:45		15:45-16:00		16:00:16:15		16:15-16:30	
		H	Total	H	Total	H	Total	H	Total	H	Total	H	Total	H	Total	H	Total	H	Total	H	Total	H	Total	H	Total
Pine Av (northbound)	L	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	0	0	0	0	0	0
	T	0	12	0	16	0	15	2	29	0	15	0	9	0	8	1	12	1	7	0	15	0	10	0	9
	R	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
	U	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
Garden Av (westbound)	L	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0
	T	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	R	0	2	0	2	0	4	0	1	0	2	0	3	0	0	0	2	0	1	0	2	0	3	0	3
	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Pine Av (southbound)	R	0	0	0	0	0	2	0	2	2	2	0	2	0	0	0	2	0	5	0	2	0	1	0	4
	T	0	10	0	7	0	4	0	7	0	6	0	10	1	7	0	8	1	11	0	9	1	15	0	10
	L	0	1	0	0	0	1	0	0	0	1	0	1	1	3	0	1	0	6	0	1	0	1	0	3
	U	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Garden Av (eastbound)	L	0	1	0	0	1	1	1	1	0	0	0	1	0	0	0	0	1	1	0	1	0	0	0	0
	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
	R	0	1	0	2	0	3	0	3	0	4	0	0	0	1	0	4	0	1	0	3	0	1	0	2
	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3 | Main Arm Road and Chinbible Avenue intersection survey (AM)

		Friday 16th February 2024															
		07:35 - 07:50		07:50 - 08:05		08:05 - 08:20		08:20 - 08:35		08:35 - 08:50		08:50 - 09:05		09:05 - 09:20		09:20 - 09:35	
		HV	Total	HV	Total	HV	Total	HV	Total	HV	Total	HV	Total	HV	Total	HV	Total
Main Arm Rd (eastbound)	L	0	0	0	0	0	0	0	1	0	1	0	0	0	2	0	1
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	T	3	45	1	53	0	46	3	61	3	52	2	52	1	55	4	55
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	R	0	6	0	0	2	3	0	2	0	0	0	2	0	5	0	4
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	R2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	U	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0
Dog Park	L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	R	0	0	0	0	1	1	0	0	0	2	0	0	0	1	0	0
	R2	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chinbible Av (northbound)	L2	0	0	0	1	0	0	0	1	0	0	0	0	0	1	0	1
	L	0	1	0	4	0	3	0	0	1	6	0	3	0	3	0	3
	T	0	0	0	1	0	0	0	0	0	1	0	0	0	1	0	0
	R	0	25	0	38	0	22	0	36	0	33	0	22	0	25	0	17
	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Main Arm Rd (westbound)	R	0	0	0	0	0	2	0	1	1	3	3	0	0	1	0	2
	T	3	27	0	31	1	31	1	51	4	50	37	2	1	36	0	20
	L2	0	28	0	25	0	21	0	19	0	20	18	0	0	24	0	12
	L	0	0	0	3	0	1	0	0	0	0	4	0	0	0	0	3
	U	0	1	0	0	0	0	0	0	0	0	1	0	0	2	0	0
Chinbible Av (southbound)	R	0	0	0	0	0	0	0	1	0	1	0	0	0	3	0	0
	TR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TL	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0
	L	0	0	0	2	0	2	0	0	0	4	0	0	0	3	0	3
	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 4 | Main Arm Road and Chinbible Avenue intersection survey (PM)

		Thursday 8th February 2024															
		15:05 - 15:20		15:20 - 15:35		15:35 - 15:50		15:50 - 16:05		16:05 - 16:20		16:20 - 16:35		16:35 - 16:50		16:50 - 17:05	
		HV	Total	HV	Total	HV	Total	HV	Total	HV	Total	HV	Total	HV	Total	HV	Total
Main Arm Rd (eastbound)	L	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	T	1	52	1	41	0	32	0	30	2	36	1	39	0	27	1	37
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	R	0	4	0	4	0	1	0	0	0	1	0	1	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	R2	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dog Park	L	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	T	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	R	0	1	0	1	0	0	0	1	0	0	0	2	0	1	0	0
	R2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Chinbible Av (northbound)	L2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	L	0	2	0	2	0	3	0	0	0	2	0	0	0	2	0	1
	T	0	0	0	2	0	0	0	0	0	0	0	0	0	0	0	0
	R	0	2	1	6	1	8	0	4	0	2	0	6	0	5	0	3
	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Main Arm Rd (westbound)	R	0	0	0	3	0	1	0	2	0	2	0	1	0	3	0	1
	T	0	32	2	45	0	31	2	36	3	36	2	47	0	32	1	34
	L2	0	12	1	13	0	12	0	6	0	4	0	7	0	4	0	5
	L	0	0	0	2	0	2	0	2	0	0	0	3	0	0	0	1
	U	0	0	0	1	0	0	0	2	0	0	0	0	0	0	0	0
Chinbible Av (southbound)	R	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	1
	TR	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	TL	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
	L	0	0	1	1	0	0	0	0	0	1	0	1	0	1	0	0
	U	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3. PROPOSED DEVELOPMENT

3.1. Roadworks

As part of the Development Application to subdivide the subject site to create 6 additional torrens title lots, it was proposed to widen Garden Avenue along the site frontage and construct mountable kerb and guttering, consistent with the geometry of Garden Avenue just east of the subject site. This report for the subject DA (strata title subdivision of Lot 7) is based on the assumption that such widening is accepted and will be in place.

3.2. Site access and manoeuvring

It is proposed to create access to the strata lots by constructing a one-way clock-wise driveway loop through the site. This provides access to nearly all lots. There are 4 lots with no direct access to this driveway loop, and therefore the internal driveway will have a short dead-end section of two-way traffic, as shown in Figure 4 above.

The internal driveway has been designed to cater for the safe and efficient manoeuvring of a Medium Rigid Vehicle (MRV), as defined in AS2890.2:2002. The MRV is suitable to represent a typical garbage truck and a fire fighting vehicle. The engineering drawings supplied with the Development Application include design vehicle swept paths, which demonstrate the adequacy of the proposed internal access road.

There will be several parallel visitor parks placed along the internal driveway. Adequate width needs to be provided to ensure the safe passing of a parked car by the MRV design vehicle. AS 2890.2:2002 provides the following requirements to facilitate this.

- Table 3.1 of this standard requires a minimum single lane width of 3.5 metres for an MRV on a straight.
- Clause 3.3.2 (a) of this standard states: "*Where parallel parking is to be catered for, the roadway shall be widened by (…) 2.4m for each lane of car parking*"
- With respect to manoeuvring clearances, clause 5.4 states *"When using the turning and manoeuvring templates (…) the following manoeuvring clearances shall be applied: (a) Low speed manoeuvres, e.g. when entering or leaving a service bay or parking bay – 300mm on both sides of the vehicle; (b) Higher speed manoeuvres in the forward direction: e.g. negotiating access driveways and circulation roadways – an additional 300mm on the outside of the curve over the curved portion of the template; (c) – for two vehicles passing one another – 300mm on both sides of both vehicles plus a further 300mm.*

Based on the above, the following criteria have been applied to the design of the internal circulation road way:

- On straights, a minimum pavement width of 3.5 metres. The width between strata boundaries along the internal circulation road way varies between 5.0 metres and 6.7 metres. This is adequate to ensure this requirement is met.
- Where there is parallel parking proposed, a minimum pavement width of 2.4m + 3.5m = 5.9m to be supplied. Therefore parallel parking is limited sections with a minimum width between boundaries of 5.9 metres.
- Where there is parallel parking, the minimum spacing between any front boundary fences shall be 5 x 0.3m plus the body width of a B99 vehicle and an MRV, thus 5 x 0.3m + 1.94m + 2.5m = 5.94 metres.

Site entry will be off Garden Avenue at the eastern portion of the site. No further widening of Garden Avenue is required, given the very low traffic volume on Garden Avenue, adequate sight distances, and a very low heavy vehicle percentage that will be accessing the site (only a garbage truck in normal conditions). The Austroads 'warrant' graph often referred to require the construction of auxiliary lanes does not apply to this situation, as the warrant graph should only be used to 'warrant' a lesser intersection design if a channelised turn treatment is required in the first place. More on this topic in Appendix A.

The access facility category (AS/NZS 2890.1:2004, table 3.1) applicable to this proposal is category 1 (user class 1, 25-100 spaces, local road frontage type). Thus the entry width shall be designed between 3.0 and 5.5 metres on the property boundary. The cross over layout shall be as per NRLG R-05 (for mountable kerbs) and the MRV swept path. The cross over design is provided in the engineering drawings supplied with this DA and demonstrate compliance with these criteria.

The exit width for a category 1 access facility shall be at least 3.0 metres. The cross over layout shall be as per NRLG R-05 (for mountable kerbs) and where required adjusted to suit the MRV swept path. The cross over design is provided in the engineering drawings supplied with this DA and demonstrate compliance with these criteria.

3.3. Sight distances

According to AS/NZS 2890.1:2004 requirements shown in Figure 9, a minimum of 40m vehicle sight distance from the driver's perspective should be provided to vehicles leaving the subject site onto a 50 km/h posted speed limit frontage road.

Frontage road speed (Note 4) km/h	Distance (Y) along frontage road m		
	Access driveways other than domestic (Note 5)		Domestic property access (Note 6)
	Desirable 5 s gap	Minimum SSD	
40	55	35	30
50	69	45	40
60	83	65	55
70	97	85	70
80	111	105	95
90	125	130	Use values from 2nd and 3rd columns
100	139	160	
110	153	190	

Figure 9 | Driveway sight distance requirements, *Source: AS/NZS 2890.1:2004*

With respect to Garden Avenue, this criterion only applies to the proposed exit driveway, just west of the existing dwelling. Figure 10 and Figure 11 demonstrate that this is easily achieved. The sight line to the right extends all the way to Pine Avenue, at approximately 270m distance. The sight line to the left is estimated as approximately 52 metres and it should be noted that this is through a 90° turn, which slows down approaching vehicles and increases the gap time.

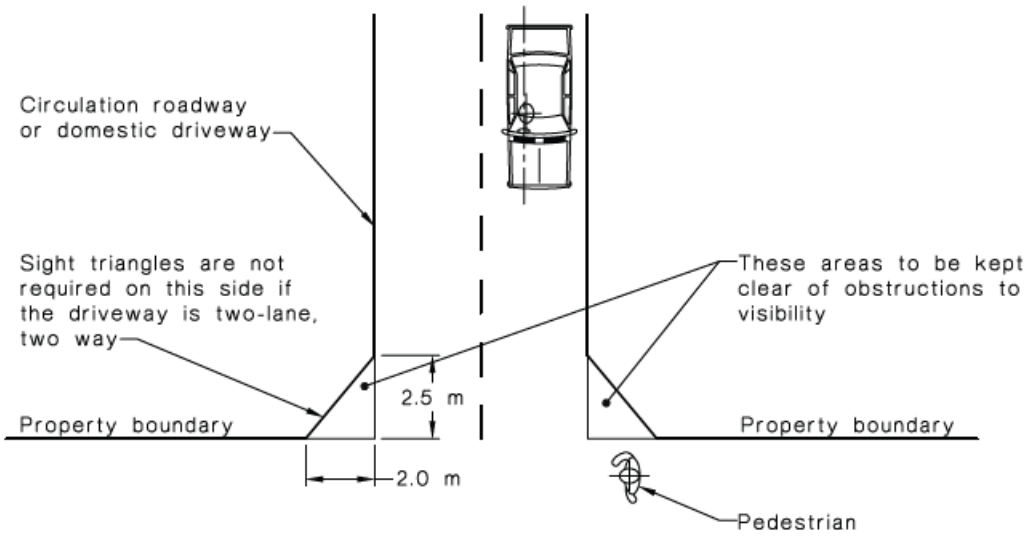
Figure 10 | Sight line to the right

Figure 11 | Sight line to the left

3.4. Sightlines to pedestrians (exit driveway)

On either side of the driveway at the property boundary, no obstruction shall exist that will prevent drivers from observing pedestrian traffic. AS/NZS 2890.1:2004 requires a minimum of 2.5m x 2.0m sight triangles to comply with this requirement.

In order to achieve this, no visual obstructions are proposed to be constructed within this sight triangle either side of the exit driveway.



DIMENSIONS IN METRES

FIGURE 3.3 MINIMUM SIGHT LINES FOR PEDESTRIAN SAFETY

Figure 12 | Pedestrian safety sight line requirements, *source: AS/NZ 2890.1:2004*

3.5. Sightlines to pedestrians (internal circulation roadway)

In order to ensure adequate sight distances for the driveways to all the dwellings coming off the internal circulation roadway, we require that no front boundary fences are constructed along the internal circulation roadway, and that no side fences are constructed within 2.5 metres of the internal circulation roadway. There should also be no planting of shrubs that can obscure the view, within 2.5 metres of the internal circulation roadway.

3.6. Parking requirements

Table B4.1 of the 2014 Byron Shire DCP stipulates the following parking rates for medium density housing:

- One space per 1- or 2-bedroom unit
- 2 spaces per 3-or more bed units
- 1 visitor space per 4 dwellings or part thereof.
- Each dwelling to have at least one covered parking space

The proposed development includes the following:

- 4 x 1-bedroom dwelling (see Figure 13)
- 1 x 2-bedroom dwelling (see Figure 14)

- 20 x 3-bedroom dwelling (see Figure 15 and Figure 16)

Each one-bedroom unit has one parking space under a carport. Each two-bedroom unit has one parking space under a carport. Each three-bedroom unit has one covered space (either carport or garage) and space for second car to park in the driveway, under a stacked arrangement. Thus adequate parking is supplied for each dwelling.

Additionally, visitor spaces should be provided on site, the total of which is calculated to be 7 (25 / 4 = 6.25, therefore 7 required). The proposal includes 10 visitor parking spaces, which are distributed along the internal circulation roadway as shown on the site plans.

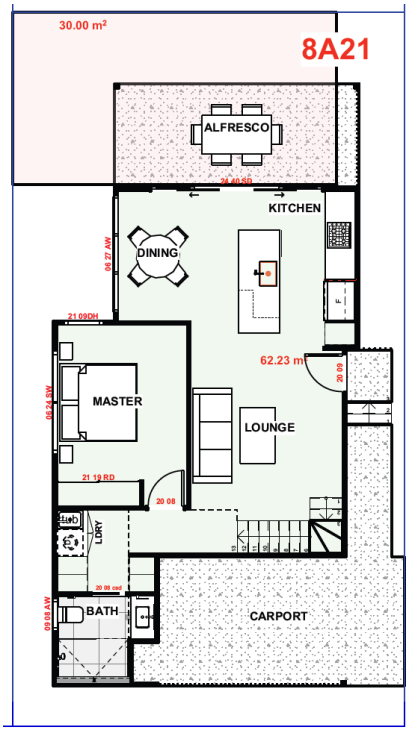


Figure 13 | 1-bedroom unit example

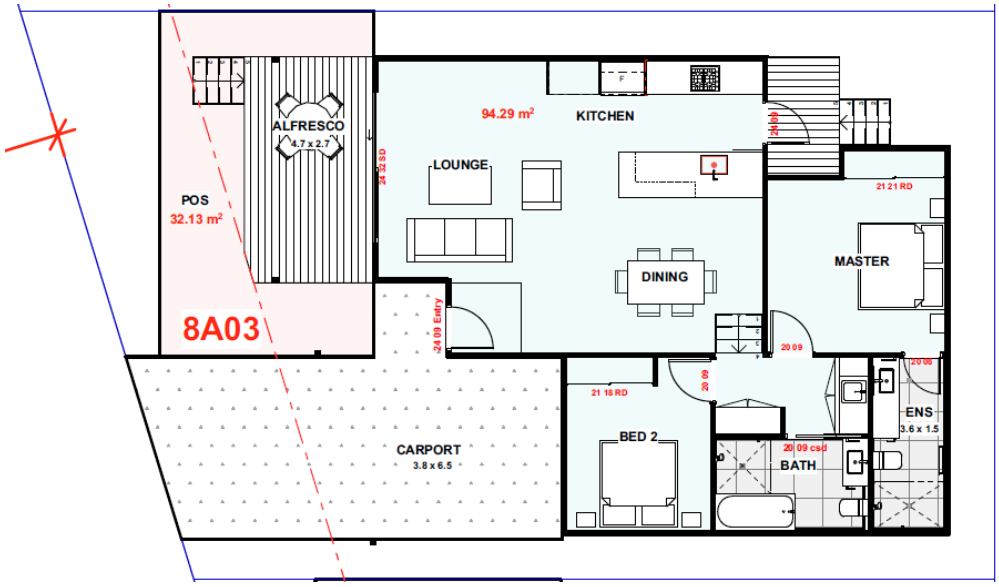


Figure 14 | 2-bedroom unit example

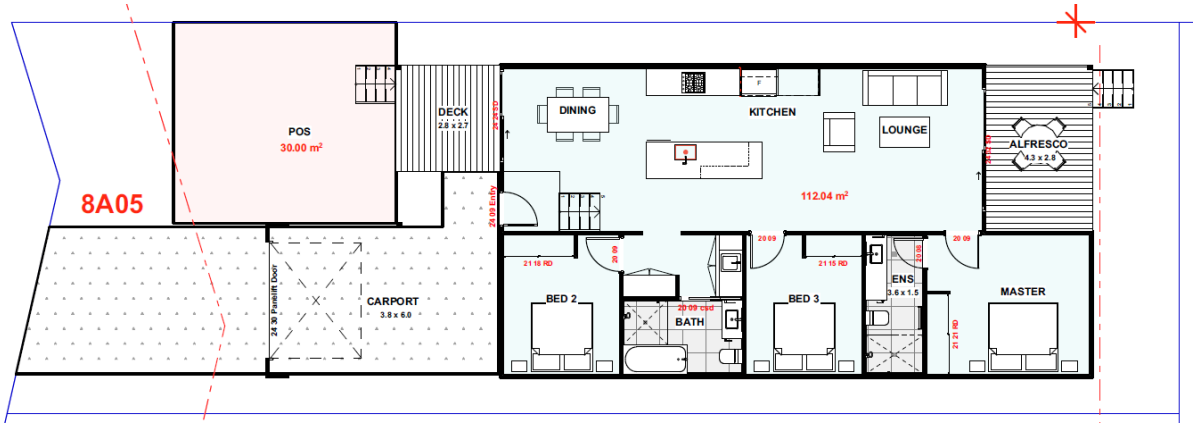


Figure 15 | 3-bedroom unit example 1

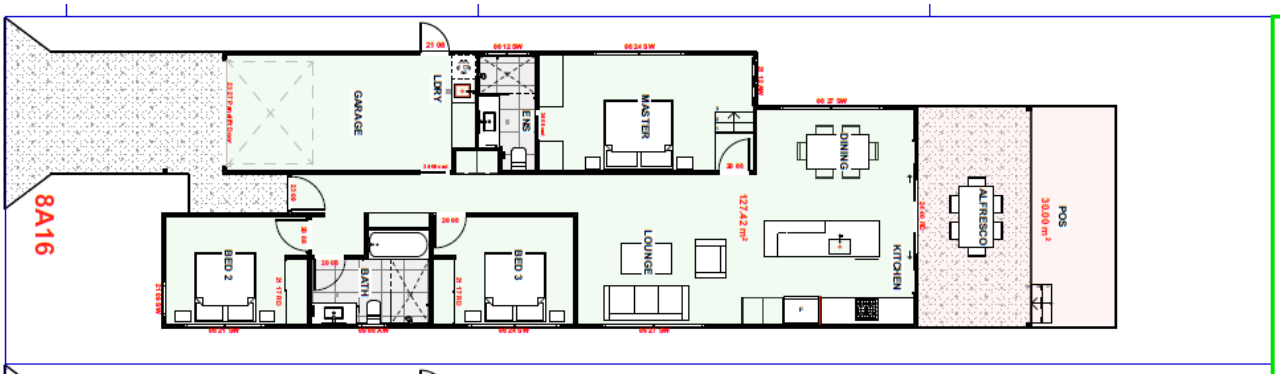


Figure 16 | 3-bedroom unit example 2

4. IMPACT ON THE ROAD NETWORK

4.1. Trip generation

The 2013 Technical Direction by the NSW Roads and Maritime Service does not provide trip generation rates for medium density dwellings. Therefore, the trip generation rates from the 2002 NSW Roads and Traffic Authority's Guide to Traffic Generating Developments will be adopted. These are as follows:

- Smaller units and flats (up to 2 bedrooms): Daily vehicle trips = 4-5 per dwelling. Weekday peak hour vehicle trips = 0.4-0.5 per dwelling.
- Larger units and townhouses (three or more bedrooms): Daily vehicle trips = 5.0-6.5 per dwelling. Weekday peak hour vehicle trips = 0.5-0.65 per dwelling.

Given ranges are supplied rather than fixed numbers, we will adopt the average number of each range, resulting in the following trip generation rates for this development:

- One- and two-bedroom units: 4.5 trips per dwelling per day / 0.45 trips per dwelling per hour during peak hour
- Three-bedroom units: 5.75 trips per dwelling per day / 0.575 trips per dwelling per hour during peak hour.

The resulting trip generation of this proposal is:

- Daily trips: 5 x 4.5 + 20 x 5.75 = 137.5 trips
- Peak hour trips: 5 x 0.45 + 20 x 0.575 = 13.75 trips

In order to adequately address the impact on the road network, we will also include the trip generation of the torrens title subdivision that was lodged under a separate DA. Given the small size of that development, trip generation calculations were not warranted under the DCP B4 requirements for a Traffic Safety Assessment, but since they are also not included in the background count and are likely to come online in a similar timeframe as the subject development, we will include the traffic generated by those low-density torrens title lots in the impact calculations.

The applicable trip generation rates are sourced from the 2014 Technical Direction by the RMS and are as follows (for low-density dwellings in regional areas in NSW):

- Daily trips: 7.4 per dwelling
- AM peak hour trips: 0.71 per dwelling
- PM peak hour trips: 0.78 per dwelling.

These rates apply to 5 (lots 2-6) lots, and can thus be calculated to be:

- Daily trips: 5 x 7.4 = 37 trips
- AM peak hour: 5 x 0.71 = 3.55 trips
- PM peak hour: 5 x 0.78 = 3.90 trips.

We have assumed one low density dwelling per lot, as that is consistent with the existing low density residential lots along Garden Avenue.

Thus, the overall trip generation of both DA's is estimated to be:

- Daily: 137.5 + 37 = **174.5** trips
- AM peak hour: 13.75 + 3.55 = **17.3** trips
- PM peak hour: 13.75 + 3.90 = **17.65** trips.

4.2. Roadway capacity

Garden Avenue and Chinbible Avenue both classify as a Local Street under Table D1.5 of the NRLG Development Design Specification. Local Streets typically have a carriageway width between 7 and 9 metres (which Garden Avenue will have after the widening proposed under the Torrens Title DA) and a maximum traffic volume of 2000 vehicles per day.

During our survey of Garden Avenue, a 7-day ADT was found of 54 vpd. This may fluctuate somewhat throughout the year. Add to this the estimated trip generation of 175 trips per day and a total post-development traffic volume of 229 trips per day (7-day ADT) is calculated. This is well below the maximum traffic volume of 2000 vpd, and therefore no further road upgrades are warranted.

The current 7-day ADT of Chinbible Avenue can be approximated by multiplying the Garden Avenue 7-day ADT with the quotient of the Chinbible peak hour volume at the Main Arm Road intersection and the Garden Avenue peak hour volume at the Pine Avenue intersection.

From our survey data, the AM peak hour at the Main Arm Road intersection is calculated to be between 7:50 and 8:50. The PM peak hour is calculated to be between 15:20 and 16:20

During these periods, the following traffic volumes are found turning of and onto Chinbible and Garden Avenue resp:

- Chinbible Avenue AM: 250
- Garden Avenue AM: 32*

- Chinbible Avenue PM: 87
- Garden Avenue PM: 22*

** timeslot shifted due to differing time slot intervals between intersection surveys*

If we base the analysis on the AM peak, then the Chinbible Avenue daily traffic volume can be estimated to be 54 x 250 / 32 = 421. If based on the PM volumes, this is estimated to be 54 x 87 / 22 = 214. The actual 7-day ADT will likely be in this range between 214 and 421 vpd.

For the worst-case scenario (7-day ADT of 421), the post-development traffic is calculated to be 421 + 175 = 596 trips per day. This is still well below the 2000 vpd roadway capacity, and therefore no upgrades to Chinbible Avenue are required.

4.3. Design horizon

A design horizon of 10 years applies to unsignalised intersections (excluding roundabouts). Therefore, the intersections with Main Arm Road and Pine Avenue will be analysed for the following scenarios:

- Scenario 1: 2024 background only
- Scenario 2: 2034 background only
- Scenario 3: 2034 background + development traffic

4.4. Background traffic growth

It is standard practise in this region to adopt a 2.5% annual compound traffic growth rate for background traffic growth. Our office has carried out detailed historic background traffic growth calculations for other (much) busier roads in Byron Shire and have found values between 3.3% and 3.5%. Given the subject development site is located on the western perimeter of Mullumbimby and there is limited potential for traffic generating development further west of the site, the likely applicable background traffic growth rate for Main Arm Road, Chinbible Avenue, Garden Avenue and Pine Avenue is not as high as the 3.3% - 3.5% range. To be conservative we will also not adopt the lower value of 2.5%. Instead, we adopt a **3.0%** compound traffic growth rate to the background traffic on the road network adjacent the subject site.

4.5. Temporal and directional traffic distribution

Temporal traffic distribution relates to the split in arrival and departure traffic as they vary between the AM and PM traffic, as this impacts on the assumed traffic flows for intersection modelling. In order to establish this temporal distribution, we have calculated the ‘inbound’ and ‘outbound’ splits during AM and PM peak periods for Chinbible and Garden Avenue based on the intersection surveys. The results are as follows.

- Chinbible Avenue AM peak: 38% inbound, 62% outbound
- Chinbible Avenue PM peak: 58% inbound, 42% outbound
- Garden Avenue AM peak: 33% inbound, 67% outbound
- Garden Avenue PM peak: 56% inbound, 43% outbound

These results confirm the expectation that outbound traffic is larger during the AM peak and vice versa during the PM peak. Given the traffic volumes in Chinbible Avenue are significantly larger than in Garden Avenue, we will adopt the Chinbible Avenue temporal distribution numbers for the development traffic. Thus the temporal distribution is:

- AM peak: 38% inbound, 62% outbound
- PM peak: 58% outbound, 42% inbound

Directional distribution is also required to provide input parameters for intersection modelling. It needs to be established which percentage of development traffic will travel via Chinbible Avenue / Main Arm Road and which percentage will travel via Garden Avenue / Pine Avenue.

The entry driveway is located some 120 metres east of Chinbible Avenue and some 170m west of Pine Avenue. Overall the vast majority will end up travelling towards the centre of Mullumbimby rather than towards Main Arm, so arrival traffic will favour the Pine Avenue route as this is a shorter distance. Departing traffic however can travel nearly straight through onto Chinbible Avenue, which saves negotiating an extra intersection (at Pine Avenue), therefore departing traffic would likely favour travel along Chinbible Avenue. On this basis we assume the following directional distribution at the site frontage:

- Arriving traffic: 80% Pine Avenue / 20% Chinbible Avenue
- Departing traffic: 90% Chinbible Avenue / 10% Pine Avenue

Then at these intersections, it is assumed that the percentages of left and right turning traffic will match the current left/right turning traffic distributions, since the future residents of the subject site are likely to exhibit the same travel behaviour as existing residents along Garden Avenue and Chinbible Avenue. Our intersection surveys show the following results:

Table 5 | Direction distribution at intersections

Turn movement	AM peak	PM peak
Chinbible left out	9%	26%
Chinbible right out	91%	74%

Chinbible left in	94%	85%
Chinbible right in	6%	15%
Garden left out	14%	22%
Garden right out	86%	78%
Garden left in	0%	8%
Garden right in	100%	92%

The distribution ratios in Table 5 will be adopted for trip generation modelling.

4.6. Heavy vehicle component

After completion of construction works at the development, the only heavy vehicles that service the development on a regular basis would be a garbage truck (which requires site access) and a school bus (which does not require site access). These services already exist in Garden Avenue and as such the development does not generate additional heavy vehicle traffic. Therefore, 100% of the generated vehicle movements by the development are assumed to be cars.

4.7. SIDRA modelling (Main Arm Road)

The SIDRA input volumes (values rounded for clarity) for each scenario are provided below. The turn movements correspond to the SIDRA site layout diagram shown in Figure 17. The movement summary table for each scenario is provided in Appendix B. The Level of Service for all legs and all scenarios is LOS A. This demonstrates excellent operation of this intersection for all scenarios.

Table 6 | Main Arm Road / Chinbible Avenue turning movements

		Sc 1 - 2024 background		Sc 2 - 2034 background		Sc 3 - 2034 background + development			
						development only		Combined	
		AM peak	PM peak	AM peak	PM peak	AM peak	PM peak	AM peak	PM peak
Main Arm Rd (eastbound)	L	2	0	2.7	0.0			2.7	0.0
	T	212	139	284.9	186.8			284.9	186.8
	R	5	6	6.7	8.1	0.1	0.3	6.8	8.4
	R2	0	0	0.0	0.0			0.0	0.0
	U	1	0	1.3	0.0			1.3	0.0
Mull umb imb	L	0	0	0.0	0.0			0.0	0.0

	T	0	0	0.0	0.0			0.0	0.0
	R	3	2	4.0	2.7			4.0	2.7
	R2	0	0	0.0	0.0			0.0	0.0
	U	0	0	0.0	0.0			0.0	0.0
Chinbible Av (northbound)	**L2**	2	0	2.7	0.0			2.7	0.0
	L	13	7	17.5	9.4	0.9	1.7	18.3	11.1
	T	2	2	2.7	2.7			2.7	2.7
	R	129	20	173.4	26.9	8.8	4.9	182.1	31.8
	U	0	0	0.0	0.0			0.0	0.0
Main Arm Rd (westbound)	**R**	6	8	8.1	10.8			8.1	10.8
	T	163	148	219.1	198.9			219.1	198.9
	L2	85	35	114.2	47.0	1.2	1.7	115.5	48.8
	L	4	6	5.4	8.1			5.4	8.1
	U	0	3	0.0	4.0			0.0	4.0
Chinbible Av (southbound)	**R**	2	2	2.7	2.7			2.7	2.7
	TR	0	0	0.0	0.0			0.0	0.0
	TL	1	0	1.3	0.0			1.3	0.0
	L	8	2	10.8	2.7			10.8	2.7
	U	0	0	0.0	0.0			0.0	0.0

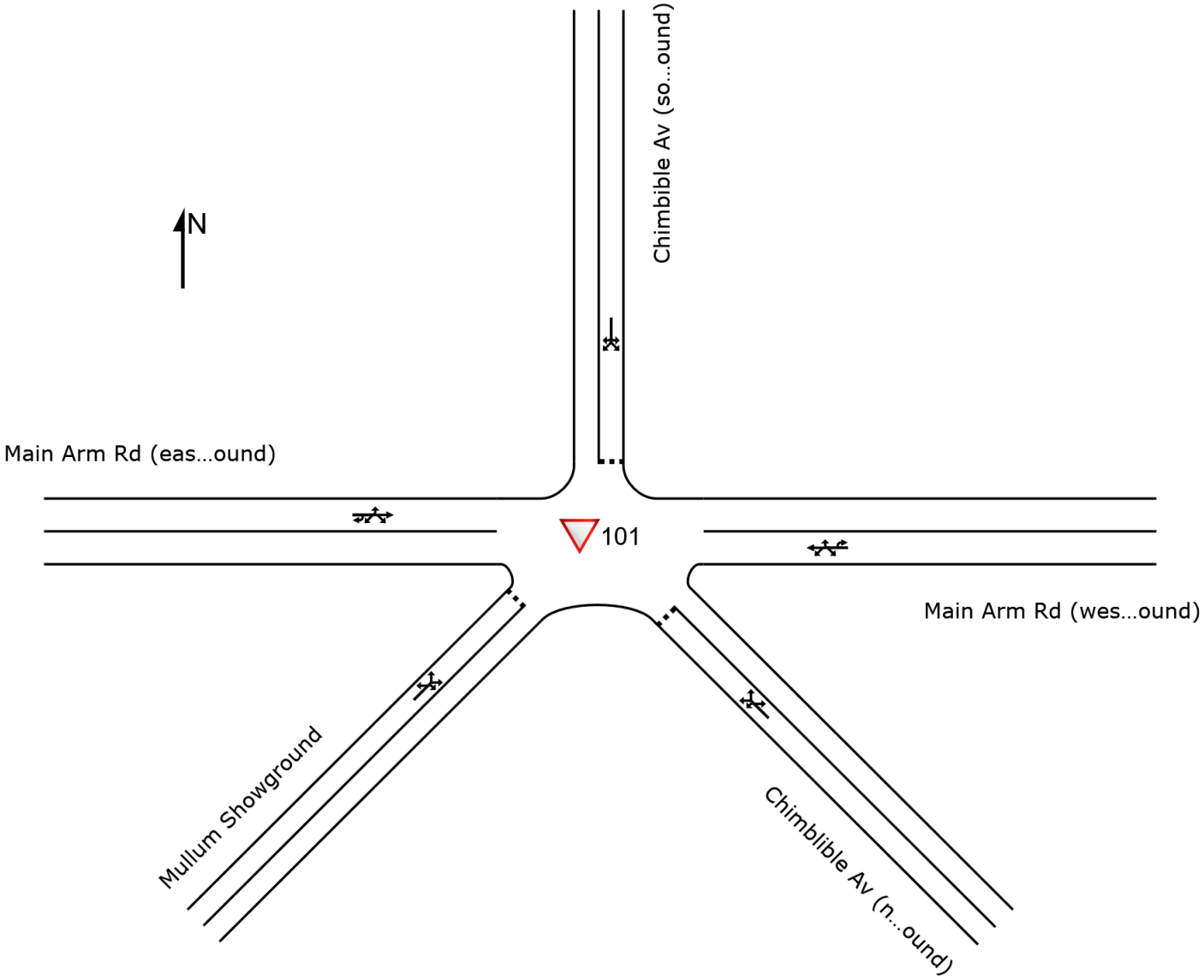


Figure 17 | Main Arm Rd intersection site layout

4.8. SIDRA modelling (Pine Avenue)

The SIDRA input volumes (values rounded off for clarity) for each scenario are provided below. The turn movements correspond to the SIDRA site layout diagram shown in Figure 18. The movement summary table for each scenario is provided in Appendix C. The Level of Service for all legs and all scenarios is LOS A. This demonstrates excellent operation of this intersection for all scenarios.

Table 7 | Pine Avenue / Garden Avenue turning movements

	Sc 1 - 2024 background		Sc 2 - 2034 background		Sc 3 - 2034 background + development			
					development only		Combined	
	AM peak	PM peak	AM peak	PM peak	AM peak	PM peak	AM peak	PM peak

Pine Av (northbound)	L	0	1	0	1	0.0	0.7	0	2
	T	75	41	101	55			101	55
	R	0	1	0	1			0	1
	U	0	1	0	1			0	1
Garden Av (westbound)	L	0	1	0	1			0	1
	T	1	0	1	0			1	0
	R	9	9	12	12			12	12
	U	0	0	0	0			0	0
Pine Av (southbound)	R	6	12	8	16	5.3	7.5	13	24
	T	24	45	32	60			32	60
	L	2	11	3	15			3	15
	U	0	0	0	0			0	0
Garden Av (eastbound)	L	2	2	3	3	0.15	0.16	3	3
	T	0	1	0	1			0	1
	R	12	7	16	9	0.9	0.6	17	10
	U	0	0	0	0			0	0

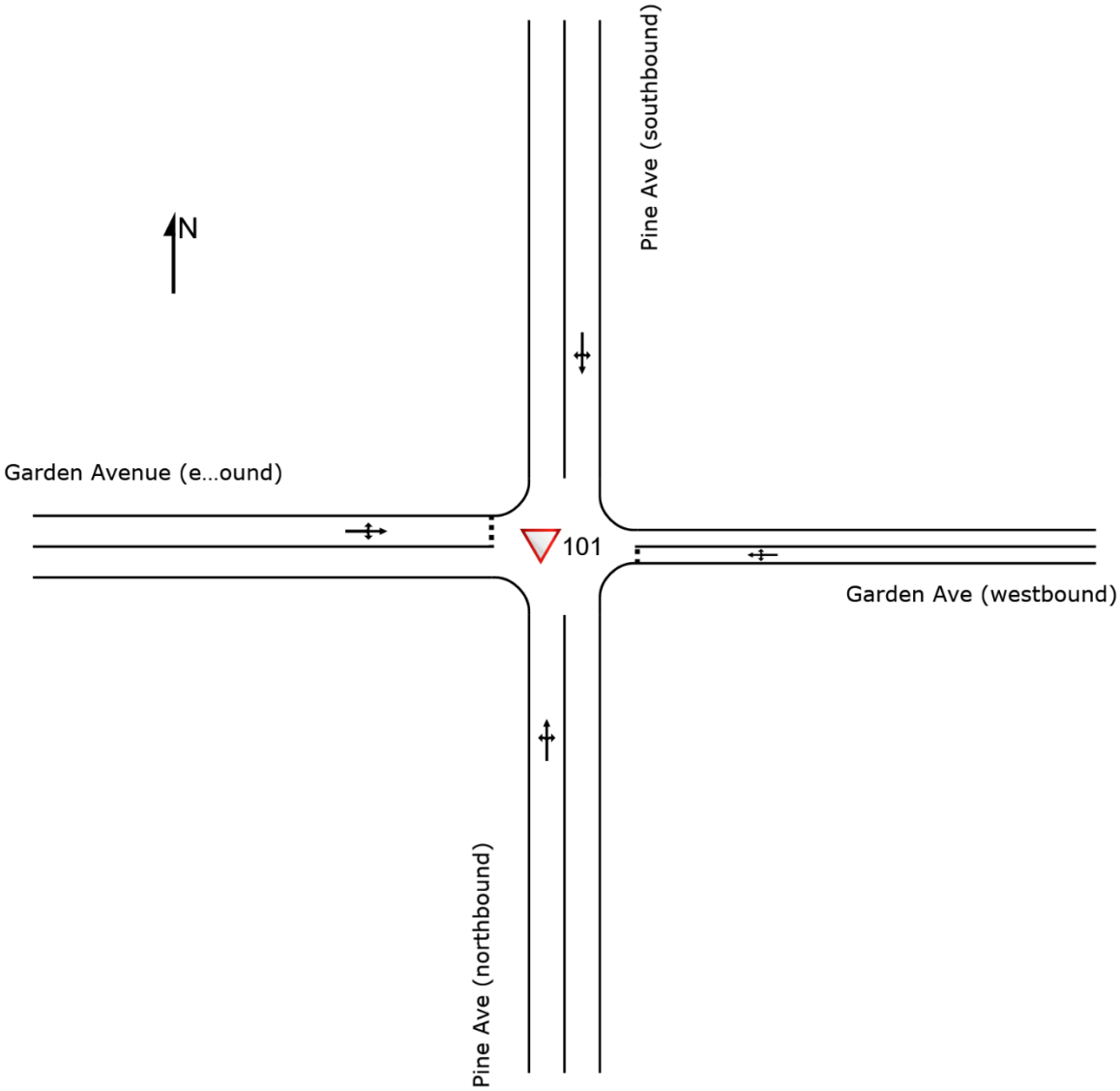


Figure 18 | Pine Ave intersection site layout

5. CONCLUSIONS AND RECOMMENDATIONS

This report demonstrates the following:

- The proposal provides for adequate off-street parking, both for residents and visitors
- The proposed entry and exit driveways of Garden Avenue are compliant with the relevant Australian Standards, in particular regarding placement, geometry and sight distances
- The existing road network has adequate capacity to carry the traffic generated by the proposal.

Based on the traffic assessment carried out in this report, we recommend the development for approval from a traffic engineering perspective.

REFERENCES

Northern Rivers Local Government - Development Design Development Manual

Handbook for Driveway Access to Property, Aus-Spec Reference, March 2018

Byron Shire Development Control Plan 2014 Chapter B4 Traffic Planning, Vehicle Parking, Circulation and Access, Byron Shire Council, Mullumbimby, 21 July 2014

Guide to Traffic Generating Developments, Roads and Traffic Authority, Version 2.2, October 2002

Guide to Traffic Generating Developments – Updated Traffic Surveys TDT 2013/04a, Roads and Maritime Services, August 2013

Austroads Guide to Road Design Part 4A: Unsignalised and signalised intersections, Austroads Inc., Sydney, June 2017

Austroads Guide to Traffic Management Part 3: Traffic Studies and Analysis, Austroads Inc., Sydney, November 2017

APPENDIX A – THE USE OF THE 'WARRANT' GRAPHS

The question regarding the often erroneous use of the 'warrant' graphs to require right or left turn treatment is discussed in this appendix.

There is a concerning growing trend in this region where engineers recommend the use of channelized turns simply because the turning movement volume of an intersection can be found on the Austroads turn treatment warrant graphs.

Some traffic engineers appear to understand this graph as always applicable. Any development is thought to need to be tested to this graph. The problem with this approach is that the graph has an origin at (0,0) in other words, 'no traffic' is also on this graph. As a result when taking this line of reasoning to its extreme, any development, no matter how low the traffic volumes are, would result in a requirement for at least a BAR/BAL turn, as any intersection with traffic falls within the graph. And that demonstrates the error in their reasoning.

The background of how this graph should be used properly is as follows. ***If*** it is decided that turning lanes are required for a development, ***then*** this graph assists with determining if a layout of lesser magnitude than a CHR/CHL is ***warranted.*** This graph only applies to intersection for which it already has been decided turning, acceleration or deceleration lanes are required. But because for some developments a CHR/CHL would be excessive, this graph provides a quantitative method of justifying a warrant for lesser arrangement, involving a reduced expense and footprint. I make reference to commentary 6 of the current Austroads Guide to Road Design Part 4 for a detailed discussion on the background of the latest warrants.

Commentary 6 of AGRD04 refers to Arndt and Troutbeck (2006) for further detail on the warrants. One of the three limitations listed by Arndt and Troutbeck (2006) is that *"they are only for high-speed roads".* Clause 3.4.1 of Austroads Guide to Road Design Part 3 says about high speed roads that "*These are roads that are designed for operating speeds in excess of 90 km/h".* In essence, this applies to (rural) highway scenarios. The 85th percentile speed on Garden Avenue at the subject site is 42km/h and therefore the warrants for turn treatments **do not apply**.

It is understood from the Austroads traffic management standard that the warrant graphs for lower speed roads are based on documentation by the Queensland department of Transport and Main Roads (TMR). There has indeed been a tendency in Queensland to apply the warrant graphs to lower speed road, although Arndt and Tourbeck (2006) clearly limit the use of these to high-speed roads only, defined

as 90km/h and over by Austroads. Blind application of these warrant graphs results in construction of BAR turns where they are absolutely not needed.

Reference is made to page 47, clause 2.3.5 of the Austroads Guide to Traffic Management Part 6, which clearly states that the need for an auxiliary lane should be determined first, depending on a number of factors, including the operational efficiency and level of safety of the intersection.

It should also be noted that the third limitation on the use of warrants by Arndt and Troutbeck is that they do not take into account the cost of construction of the various turn types. The cost of construction should always be taken into consideration when applying such graphs.

Key traffic management considerations relevant for the selection of auxiliary lanes (as per table 3.9 of the AGTTM6 (relevant to right turns) are:

- Auxiliary lanes may be added to the basic intersection to improve safety.
- Typically used in rural areas where high-speed, low-volume traffic occurs and the volume of slow manoeuvring of turning traffic is sufficient to create a conflict with following traffic.
- Generally intended to provide separation for the manoeuvring of a single vehicle.
- Left passing lane allows traffic to bypass a vehicle waiting to turn right; it is not intended for locations with regular queueing.
- Lanes should be installed on a needs basis and may not be required on all approaches.
- Consider the need for bicycle lanes.

None of these considerations trigger the need for auxiliary lanes at the subject site. A more detailed justification of this statement can be supplied upon request.

APPENDIX B – SIDRA RESULTS MAIN ARM RD INTERSECTION

MOVEMENT SUMMARY

Site: 101 [Main Arm Rd / Chinbible Av - Sc 1 2024 background- AM (Site Folder: Main Arm Rd)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Chimblible Av (northbound)															
21	L2	All MCs	2	2.8	2	2.8	0.220	4.6	LOS A	0.8	6.0	0.42	0.63	0.42	41.6
21a	L1	All MCs	14	2.8	14	2.8	0.220	4.5	LOS A	0.8	6.0	0.42	0.63	0.42	23.7
23a	R1	All MCs	2	2.8	2	2.8	0.220	6.9	LOS A	0.8	6.0	0.42	0.63	0.42	23.7
23b	R3	All MCs	136	2.8	136	2.8	0.220	8.7	LOS A	0.8	6.0	0.42	0.63	0.42	38.4
Approach			154	2.8	154	2.8	0.220	8.2	LOS A	0.8	6.0	0.42	0.63	0.42	37.2
East: Main Arm Rd (westbound)															
4b	L3	All MCs	89	2.8	89	2.8	0.148	5.5	LOS A	0.1	0.7	0.04	0.24	0.04	44.9
4a	L1	All MCs	4	2.8	4	2.8	0.148	4.6	LOS A	0.1	0.7	0.04	0.24	0.04	46.8
5	T1	All MCs	172	2.8	172	2.8	0.148	0.1	LOS A	0.1	0.7	0.04	0.24	0.04	46.2
6	R2	All MCs	6	2.8	6	2.8	0.148	5.4	LOS A	0.1	0.7	0.04	0.24	0.04	27.7
6u	U	All MCs	1	0.0	1	0.0	0.148	7.4	LOS A	0.1	0.7	0.04	0.24	0.04	45.2
Approach			273	2.8	273	2.8	0.148	2.1	NA	0.1	0.7	0.04	0.24	0.04	45.0
North: Chimbible Av (southbound)															
7	L2	All MCs	8	2.8	8	2.8	0.012	4.5	LOS A	0.0	0.3	0.35	0.52	0.35	39.4
7a	L1	All MCs	1	2.8	1	2.8	0.012	4.7	LOS A	0.0	0.3	0.35	0.52	0.35	36.9
9a	R1	All MCs	1	2.8	1	2.8	0.012	5.2	LOS A	0.0	0.3	0.35	0.52	0.35	43.3
9	R2	All MCs	2	2.8	2	2.8	0.012	6.2	LOS A	0.0	0.3	0.35	0.52	0.35	16.0
Approach			13	2.8	13	2.8	0.012	4.9	LOS A	0.0	0.3	0.35	0.52	0.35	36.5
West: Main Arm Rd (eastbound)															
10	L2	All MCs	2	2.8	2	2.8	0.119	4.6	LOS A	0.1	0.5	0.03	0.04	0.03	12.9
11	T1	All MCs	223	2.8	223	2.8	0.119	0.0	LOS A	0.1	0.5	0.03	0.04	0.03	49.5
12a	R1	All MCs	5	2.8	5	2.8	0.119	3.7	LOS A	0.1	0.5	0.03	0.04	0.03	45.7
12b	R3	All MCs	1	2.8	1	2.8	0.119	5.0	LOS A	0.1	0.5	0.03	0.04	0.03	46.9
12u	U	All MCs	1	0.0	1	0.0	0.119	6.1	LOS A	0.1	0.5	0.03	0.04	0.03	12.7
Approach			233	2.8	233	2.8	0.119	0.2	NA	0.1	0.5	0.03	0.04	0.03	48.8
SouthWest: Mullum Showground															
30b	L3	All MCs	1	2.8	1	2.8	0.008	6.0	LOS A	0.0	0.2	0.42	0.54	0.42	33.9
30a	L1	All MCs	1	2.8	1	2.8	0.008	5.1	LOS A	0.0	0.2	0.42	0.54	0.42	34.1
32a	R1	All MCs	3	2.8	3	2.8	0.008	6.9	LOS A	0.0	0.2	0.42	0.54	0.42	44.2
32	R2	All MCs	1	2.8	1	2.8	0.008	6.0	LOS A	0.0	0.2	0.42	0.54	0.42	42.7
Approach			6	2.8	6	2.8	0.008	6.3	LOS A	0.0	0.2	0.42	0.54	0.42	40.7
All Vehicles			678	2.8	678	2.8	0.220	2.9	NA	0.8	6.0	0.13	0.27	0.13	43.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Organisation: INGEN CONSULTING PTY LTD | Licence: PLUS / 1PC | Processed: Monday, 26 February 2024 12:32:20 PM
Project: V:\5. Jobs\J1295_30 Chinbible Avenue\4 - Modelling\SIDRA\J1295_SIDRA.sip9

MOVEMENT SUMMARY

Site: 101 [Main Arm Rd / Chinbible Av - Sc 1 2024 background- PM (Site Folder: Main Arm Rd)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Chimblible Av (northbound)															
21	L2	All MCs	1	2.8	1	2.8	0.036	4.6	LOS A	0.1	0.9	0.26	0.55	0.26	43.0
21a	L1	All MCs	7	2.8	7	2.8	0.036	4.2	LOS A	0.1	0.9	0.26	0.55	0.26	25.0
23a	R1	All MCs	2	2.8	2	2.8	0.036	5.5	LOS A	0.1	0.9	0.26	0.55	0.26	25.0
23b	R3	All MCs	21	2.8	21	2.8	0.036	7.1	LOS A	0.1	0.9	0.26	0.55	0.26	40.1
Approach			32	2.8	32	2.8	0.036	6.2	LOS A	0.1	0.9	0.26	0.55	0.26	36.3
East: Main Arm Rd (westbound)															
4b	L3	All MCs	37	2.8	37	2.8	0.111	5.5	LOS A	0.1	0.8	0.05	0.17	0.05	45.6
4a	L1	All MCs	6	2.8	6	2.8	0.111	4.3	LOS A	0.1	0.8	0.05	0.17	0.05	47.2
5	T1	All MCs	156	2.8	156	2.8	0.111	0.0	LOS A	0.1	0.8	0.05	0.17	0.05	47.2
6	R2	All MCs	8	2.8	8	2.8	0.111	5.1	LOS A	0.1	0.8	0.05	0.17	0.05	28.0
6u	U	All MCs	1	0.0	1	0.0	0.111	6.7	LOS A	0.1	0.8	0.05	0.17	0.05	45.8
Approach			208	2.8	208	2.8	0.111	1.4	NA	0.1	0.8	0.05	0.17	0.05	45.7
North: Chimbible Av (southbound)															
7	L2	All MCs	2	2.8	2	2.8	0.006	4.3	LOS A	0.0	0.2	0.32	0.50	0.32	39.6
7a	L1	All MCs	1	2.8	1	2.8	0.006	4.0	LOS A	0.0	0.2	0.32	0.50	0.32	37.2
9a	R1	All MCs	1	2.8	1	2.8	0.006	4.5	LOS A	0.0	0.2	0.32	0.50	0.32	43.5
9	R2	All MCs	2	2.8	2	2.8	0.006	5.5	LOS A	0.0	0.2	0.32	0.50	0.32	16.0
Approach			6	2.8	6	2.8	0.006	4.7	LOS A	0.0	0.2	0.32	0.50	0.32	33.8
West: Main Arm Rd (eastbound)															
10	L2	All MCs	1	2.8	1	2.8	0.081	4.5	LOS A	0.1	0.5	0.05	0.05	0.05	12.9
11	T1	All MCs	146	2.8	146	2.8	0.081	0.1	LOS A	0.1	0.5	0.05	0.05	0.05	49.3
12a	R1	All MCs	6	2.8	6	2.8	0.081	3.5	LOS A	0.1	0.5	0.05	0.05	0.05	45.4
12b	R3	All MCs	1	2.8	1	2.8	0.081	5.0	LOS A	0.1	0.5	0.05	0.05	0.05	46.7
12u	U	All MCs	1	0.0	1	0.0	0.081	6.1	LOS A	0.1	0.5	0.05	0.05	0.05	12.7
Approach			156	2.8	156	2.8	0.081	0.3	NA	0.1	0.5	0.05	0.05	0.05	48.5

SouthWest: Mullum Showground															
30b	L3	All MCs	1	2.8	1	2.8	0.005	5.9	LOS A	0.0	0.1	0.29	0.49	0.29	34.5
30a	L1	All MCs	1	2.8	1	2.8	0.005	4.7	LOS A	0.0	0.1	0.29	0.49	0.29	34.7
32a	R1	All MCs	2	2.8	2	2.8	0.005	5.3	LOS A	0.0	0.1	0.29	0.49	0.29	44.8
32	R2	All MCs	1	2.8	1	2.8	0.005	5.1	LOS A	0.0	0.1	0.29	0.49	0.29	43.4
Approach			5	2.8	5	2.8	0.005	5.2	LOS A	0.0	0.1	0.29	0.49	0.29	40.6
All Vehicles			407	2.8	407	2.8	0.111	1.4	NA	0.1	0.9	0.07	0.16	0.07	45.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Organisation: INGEN CONSULTING PTY LTD | Licence: PLUS / 1PC | Processed: Monday, 26 February 2024 12:32:21 PM
Project: V:\5. Jobs\J1295_30 Chinbible Avenue\4 - Modelling\SIDRA\J1295_SIDRA.sip9

MOVEMENT SUMMARY

Site: 101 [Main Arm Rd / Chinbible Av - Sc 2 2034 background- AM (Site Folder: Main Arm Rd)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Chimblible Av (northbound)															
21	L2	All MCs	3	2.8	3	2.8	0.362	5.4	LOS A	1.8	13.3	0.57	0.73	0.69	39.7
21a	L1	All MCs	18	2.8	18	2.8	0.362	5.7	LOS A	1.8	13.3	0.57	0.73	0.69	21.9
23a	R1	All MCs	3	2.8	3	2.8	0.362	10.1	LOS A	1.8	13.3	0.57	0.73	0.69	22.0
23b	R3	All MCs	183	2.8	183	2.8	0.362	11.9	LOS A	1.8	13.3	0.57	0.73	0.69	36.0
Approach			207	2.8	207	2.8	0.362	11.2	LOS A	1.8	13.3	0.57	0.73	0.69	34.8
East: Main Arm Rd (westbound)															
4b	L3	All MCs	120	2.8	120	2.8	0.200	5.5	LOS A	0.1	1.0	0.05	0.25	0.05	44.8
4a	L1	All MCs	6	2.8	6	2.8	0.200	5.0	LOS A	0.1	1.0	0.05	0.25	0.05	46.7
5	T1	All MCs	231	2.8	231	2.8	0.200	0.1	LOS A	0.1	1.0	0.05	0.25	0.05	46.1
6	R2	All MCs	9	2.8	9	2.8	0.200	5.8	LOS A	0.1	1.0	0.05	0.25	0.05	27.7
6u	U	All MCs	1	0.0	1	0.0	0.200	8.2	LOS A	0.1	1.0	0.05	0.25	0.05	45.2
Approach			366	2.8	366	2.8	0.200	2.1	NA	0.1	1.0	0.05	0.25	0.05	45.0
North: Chimbible Av (southbound)															
7	L2	All MCs	11	2.8	11	2.8	0.018	4.8	LOS A	0.1	0.5	0.41	0.56	0.41	38.7
7a	L1	All MCs	1	2.8	1	2.8	0.018	5.7	LOS A	0.1	0.5	0.41	0.56	0.41	36.1

9a	R1	All MCs	1	2.8	1	2.8	0.018	6.5	LOS A	0.1	0.5	0.41	0.56	0.41	42.8
9	R2	All MCs	3	2.8	3	2.8	0.018	7.5	LOS A	0.1	0.5	0.41	0.56	0.41	15.6
Approach			17	2.8	17	2.8	0.018	5.5	LOS A	0.1	0.5	0.41	0.56	0.41	35.7
West: Main Arm Rd (eastbound)															
10	L2	All MCs	3	2.8	3	2.8	0.161	5.1	LOS A	0.1	0.7	0.04	0.05	0.04	12.9
11	T1	All MCs	300	2.8	300	2.8	0.161	0.1	LOS A	0.1	0.7	0.04	0.05	0.04	49.5
12a	R1	All MCs	7	2.8	7	2.8	0.161	4.3	LOS A	0.1	0.7	0.04	0.05	0.04	45.6
12b	R3	All MCs	1	2.8	1	2.8	0.161	5.4	LOS A	0.1	0.7	0.04	0.05	0.04	46.8
12u	U	All MCs	1	0.0	1	0.0	0.161	6.7	LOS A	0.1	0.7	0.04	0.05	0.04	12.7
Approach			312	2.8	312	2.8	0.161	0.3	NA	0.1	0.7	0.04	0.05	0.04	48.8
SouthWest: Mullum Showground															
30b	L3	All MCs	1	2.8	1	2.8	0.013	6.2	LOS A	0.0	0.3	0.51	0.61	0.51	33.1
30a	L1	All MCs	1	2.8	1	2.8	0.013	5.8	LOS A	0.0	0.3	0.51	0.61	0.51	33.3
32a	R1	All MCs	4	2.8	4	2.8	0.013	8.9	LOS A	0.0	0.3	0.51	0.61	0.51	43.2
32	R2	All MCs	1	2.8	1	2.8	0.013	6.5	LOS A	0.0	0.3	0.51	0.61	0.51	41.7
Approach			7	2.8	7	2.8	0.013	7.7	LOS A	0.0	0.3	0.51	0.61	0.51	40.3
All Vehicles			909	2.8	909	2.8	0.362	3.6	NA	1.8	13.3	0.17	0.29	0.20	42.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Organisation: INGEN CONSULTING PTY LTD | Licence: PLUS / 1PC | Processed: Monday, 26 February 2024 12:32:21 PM
Project: V:\5. Jobs\J1295_30 Chinbible Avenue\4 - Modelling\SIDRA\J1295_SIDRA.sip9

MOVEMENT SUMMARY

Site: 101 [Main Arm Rd / Chinbible Av - Sc 2 2034 background- PM (Site Folder: Main Arm Rd)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Chimblible Av (northbound)															
21	L2	All MCs	1	2.8	1	2.8	0.056	4.6	LOS A	0.2	1.4	0.35	0.58	0.35	42.4
21a	L1	All MCs	10	2.8	10	2.8	0.056	4.4	LOS A	0.2	1.4	0.35	0.58	0.35	24.4
23a	R1	All MCs	3	2.8	3	2.8	0.056	6.4	LOS A	0.2	1.4	0.35	0.58	0.35	24.5
23b	R3	All MCs	28	2.8	28	2.8	0.056	8.1	LOS A	0.2	1.4	0.35	0.58	0.35	39.3
Approach			42	2.8	42	2.8	0.056	7.1	LOS A	0.2	1.4	0.35	0.58	0.35	35.6

East: Main Arm Rd (westbound)															
4b	L3	All MCs	49	2.8	49	2.8	0.153	5.7	LOS A	0.2	1.5	0.07	0.19	0.07	45.4
4a	L1	All MCs	9	2.8	9	2.8	0.153	4.6	LOS A	0.2	1.5	0.07	0.19	0.07	47.1
5	T1	All MCs	209	2.8	209	2.8	0.153	0.1	LOS A	0.2	1.5	0.07	0.19	0.07	47.0
6	R2	All MCs	11	2.8	11	2.8	0.153	5.3	LOS A	0.2	1.5	0.07	0.19	0.07	28.0
6u	U	All MCs	4	0.0	4	0.0	0.153	7.2	LOS A	0.2	1.5	0.07	0.19	0.07	45.6
Approach			283	2.8	283	2.8	0.153	1.5	NA	0.2	1.5	0.07	0.19	0.07	45.5
North: Chimbible Av (southbound)															
7	L2	All MCs	3	2.8	3	2.8	0.009	4.5	LOS A	0.0	0.2	0.38	0.53	0.38	38.9
7a	L1	All MCs	1	2.8	1	2.8	0.009	4.6	LOS A	0.0	0.2	0.38	0.53	0.38	36.3
9a	R1	All MCs	1	2.8	1	2.8	0.009	5.3	LOS A	0.0	0.2	0.38	0.53	0.38	43.0
9	R2	All MCs	3	2.8	3	2.8	0.009	6.3	LOS A	0.0	0.2	0.38	0.53	0.38	15.7
Approach			8	2.8	8	2.8	0.009	5.3	LOS A	0.0	0.2	0.38	0.53	0.38	32.3
West: Main Arm Rd (eastbound)															
10	L2	All MCs	1	2.8	1	2.8	0.108	4.8	LOS A	0.1	0.7	0.05	0.06	0.05	12.9
11	T1	All MCs	197	2.8	197	2.8	0.108	0.1	LOS A	0.1	0.7	0.05	0.06	0.05	49.3
12a	R1	All MCs	9	2.8	9	2.8	0.108	3.8	LOS A	0.1	0.7	0.05	0.06	0.05	45.4
12b	R3	All MCs	1	2.8	1	2.8	0.108	5.2	LOS A	0.1	0.7	0.05	0.06	0.05	46.7
12u	U	All MCs	1	0.0	1	0.0	0.108	6.5	LOS A	0.1	0.7	0.05	0.06	0.05	12.7
Approach			208	2.8	208	2.8	0.108	0.3	NA	0.1	0.7	0.05	0.06	0.05	48.7
SouthWest: Mullum Showground															
30b	L3	All MCs	1	2.8	1	2.8	0.007	6.1	LOS A	0.0	0.2	0.36	0.51	0.36	34.2
30a	L1	All MCs	1	2.8	1	2.8	0.007	5.1	LOS A	0.0	0.2	0.36	0.51	0.36	34.4
32a	R1	All MCs	3	2.8	3	2.8	0.007	6.2	LOS A	0.0	0.2	0.36	0.51	0.36	44.5
32	R2	All MCs	1	2.8	1	2.8	0.007	5.2	LOS A	0.0	0.2	0.36	0.51	0.36	43.0
Approach			6	2.8	6	2.8	0.007	5.8	LOS A	0.0	0.2	0.36	0.51	0.36	40.8
All Vehicles			547	2.8	547	2.8	0.153	1.6	NA	0.2	1.5	0.09	0.18	0.09	45.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Organisation: INGEN CONSULTING PTY LTD | Licence: PLUS / 1PC | Processed: Monday, 26 February 2024 12:32:22 PM
Project: V:\5. Jobs\J1295_30 Chinbible Avenue\4 - Modelling\SIDRA\J1295_SIDRA.sip9

MOVEMENT SUMMARY

Site: 101 [Main Arm Rd / Chinbible Av - Sc 3 2034 combined - AM (Site Folder: Main Arm Rd)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Chimblible Av (northbound)															
21	L2	All MCs	3	2.8	3	2.8	0.380	5.5	LOS A	2.0	14.6	0.58	0.74	0.73	39.5
21a	L1	All MCs	19	2.8	19	2.8	0.380	5.9	LOS A	2.0	14.6	0.58	0.74	0.73	21.8
23a	R1	All MCs	3	2.8	3	2.8	0.380	10.4	LOS A	2.0	14.6	0.58	0.74	0.73	21.9
23b	R3	All MCs	192	2.8	192	2.8	0.380	12.1	LOS A	2.0	14.6	0.58	0.74	0.73	35.8
Approach			217	2.8	217	2.8	0.380	11.5	LOS A	2.0	14.6	0.58	0.74	0.73	34.7
East: Main Arm Rd (westbound)															
4b	L3	All MCs	122	2.8	122	2.8	0.200	5.5	LOS A	0.1	1.0	0.05	0.25	0.05	44.8
4a	L1	All MCs	6	2.8	6	2.8	0.200	5.0	LOS A	0.1	1.0	0.05	0.25	0.05	46.7
5	T1	All MCs	231	2.8	231	2.8	0.200	0.1	LOS A	0.1	1.0	0.05	0.25	0.05	46.1
6	R2	All MCs	9	2.8	9	2.8	0.200	5.8	LOS A	0.1	1.0	0.05	0.25	0.05	27.7
6u	U	All MCs	1	0.0	1	0.0	0.200	8.2	LOS A	0.1	1.0	0.05	0.25	0.05	45.1
Approach			367	2.8	367	2.8	0.200	2.1	NA	0.1	1.0	0.05	0.25	0.05	45.0
North: Chimbible Av (southbound)															
7	L2	All MCs	11	2.8	11	2.8	0.018	4.8	LOS A	0.1	0.5	0.41	0.56	0.41	38.7
7a	L1	All MCs	1	2.8	1	2.8	0.018	5.7	LOS A	0.1	0.5	0.41	0.56	0.41	36.1
9a	R1	All MCs	1	2.8	1	2.8	0.018	6.5	LOS A	0.1	0.5	0.41	0.56	0.41	42.8
9	R2	All MCs	3	2.8	3	2.8	0.018	7.5	LOS A	0.1	0.5	0.41	0.56	0.41	15.6
Approach			17	2.8	17	2.8	0.018	5.5	LOS A	0.1	0.5	0.41	0.56	0.41	35.7
West: Main Arm Rd (eastbound)															
10	L2	All MCs	3	2.8	3	2.8	0.161	5.1	LOS A	0.1	0.7	0.04	0.05	0.04	12.9
11	T1	All MCs	300	2.8	300	2.8	0.161	0.1	LOS A	0.1	0.7	0.04	0.05	0.04	49.4
12a	R1	All MCs	7	2.8	7	2.8	0.161	4.3	LOS A	0.1	0.7	0.04	0.05	0.04	45.6
12b	R3	All MCs	1	2.8	1	2.8	0.161	5.4	LOS A	0.1	0.7	0.04	0.05	0.04	46.8
12u	U	All MCs	1	0.0	1	0.0	0.161	6.7	LOS A	0.1	0.7	0.04	0.05	0.04	12.7
Approach			312	2.8	312	2.8	0.161	0.3	NA	0.1	0.7	0.04	0.05	0.04	48.8
SouthWest: Mullum Showground															
30b	L3	All MCs	1	2.8	1	2.8	0.013	6.2	LOS A	0.0	0.3	0.51	0.61	0.51	33.1
30a	L1	All MCs	1	2.8	1	2.8	0.013	5.8	LOS A	0.0	0.3	0.51	0.61	0.51	33.2
32a	R1	All MCs	4	2.8	4	2.8	0.013	9.0	LOS A	0.0	0.3	0.51	0.61	0.51	43.1
32	R2	All MCs	1	2.8	1	2.8	0.013	6.6	LOS A	0.0	0.3	0.51	0.61	0.51	41.6
Approach			7	2.8	7	2.8	0.013	7.8	LOS A	0.0	0.3	0.51	0.61	0.51	40.2
All Vehicles			920	2.8	920	2.8	0.380	3.8	NA	2.0	14.6	0.18	0.30	0.22	42.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [Main Arm Rd / Chinbible Av - Sc 3 2034 combined - PM (Site Folder: Main Arm Rd)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
SouthEast: Chimblible Av (northbound)															
21	L2	All MCs	1	2.8	1	2.8	0.065	4.6	LOS A	0.2	1.6	0.36	0.59	0.36	42.4
21a	L1	All MCs	12	2.8	12	2.8	0.065	4.4	LOS A	0.2	1.6	0.36	0.59	0.36	24.4
23a	R1	All MCs	3	2.8	3	2.8	0.065	6.5	LOS A	0.2	1.6	0.36	0.59	0.36	24.4
23b	R3	All MCs	33	2.8	33	2.8	0.065	8.2	LOS A	0.2	1.6	0.36	0.59	0.36	39.3
Approach			49	2.8	49	2.8	0.065	7.1	LOS A	0.2	1.6	0.36	0.59	0.36	35.6
East: Main Arm Rd (westbound)															
4b	L3	All MCs	51	2.8	51	2.8	0.154	5.7	LOS A	0.2	1.5	0.07	0.19	0.07	45.4
4a	L1	All MCs	9	2.8	9	2.8	0.154	4.6	LOS A	0.2	1.5	0.07	0.19	0.07	47.1
5	T1	All MCs	209	2.8	209	2.8	0.154	0.1	LOS A	0.2	1.5	0.07	0.19	0.07	46.9
6	R2	All MCs	11	2.8	11	2.8	0.154	5.3	LOS A	0.2	1.5	0.07	0.19	0.07	27.9
6u	U	All MCs	4	0.0	4	0.0	0.154	7.2	LOS A	0.2	1.5	0.07	0.19	0.07	45.6
Approach			285	2.8	285	2.8	0.154	1.5	NA	0.2	1.5	0.07	0.19	0.07	45.5
North: Chimbible Av (southbound)															
7	L2	All MCs	3	2.8	3	2.8	0.009	4.5	LOS A	0.0	0.2	0.38	0.53	0.38	38.9
7a	L1	All MCs	1	2.8	1	2.8	0.009	4.6	LOS A	0.0	0.2	0.38	0.53	0.38	36.3
9a	R1	All MCs	1	2.8	1	2.8	0.009	5.3	LOS A	0.0	0.2	0.38	0.53	0.38	42.9
9	R2	All MCs	3	2.8	3	2.8	0.009	6.3	LOS A	0.0	0.2	0.38	0.53	0.38	15.6
Approach			8	2.8	8	2.8	0.009	5.3	LOS A	0.0	0.2	0.38	0.53	0.38	32.3
West: Main Arm Rd (eastbound)															
10	L2	All MCs	1	2.8	1	2.8	0.108	4.8	LOS A	0.1	0.7	0.05	0.06	0.05	12.9
11	T1	All MCs	197	2.8	197	2.8	0.108	0.1	LOS A	0.1	0.7	0.05	0.06	0.05	49.3
12a	R1	All MCs	9	2.8	9	2.8	0.108	3.8	LOS A	0.1	0.7	0.05	0.06	0.05	45.4
12b	R3	All MCs	1	2.8	1	2.8	0.108	5.2	LOS A	0.1	0.7	0.05	0.06	0.05	46.7
12u	U	All MCs	1	0.0	1	0.0	0.108	6.5	LOS A	0.1	0.7	0.05	0.06	0.05	12.7
Approach			209	2.8	209	2.8	0.108	0.3	NA	0.1	0.7	0.05	0.06	0.05	48.7
SouthWest: Mullum Showground															
30b	L3	All MCs	1	2.8	1	2.8	0.007	6.1	LOS A	0.0	0.2	0.37	0.52	0.37	34.2
30a	L1	All MCs	1	2.8	1	2.8	0.007	5.1	LOS A	0.0	0.2	0.37	0.52	0.37	34.3
32a	R1	All MCs	3	2.8	3	2.8	0.007	6.2	LOS A	0.0	0.2	0.37	0.52	0.37	44.5
32	R2	All MCs	1	2.8	1	2.8	0.007	5.2	LOS A	0.0	0.2	0.37	0.52	0.37	43.0
Approach			6	2.8	6	2.8	0.007	5.8	LOS A	0.0	0.2	0.37	0.52	0.37	40.8
All Vehicles			556	2.8	556	2.8	0.154	1.7	NA	0.2	1.6	0.10	0.18	0.10	44.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

APPENDIX C – SIDRA RESULTS PINE AVE INTERSECTION

MOVEMENT SUMMARY

Site: 101 [Pine Ave / Garden Ave - Sc 1 2024 background - AM (Site Folder: Pine Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pine Ave (northbound)															
1	L2	All MCs	1	2.8	1	2.8	0.040	4.6	LOS A	0.0	0.1	0.00	0.01	0.00	47.5
2	T1	All MCs	79	2.8	79	2.8	0.040	0.0	LOS A	0.0	0.1	0.00	0.01	0.00	49.9
3	R2	All MCs	1	2.8	1	2.8	0.040	4.6	LOS A	0.0	0.1	0.00	0.01	0.00	46.4
Approach			81	2.8	81	2.8	0.040	0.1	NA	0.0	0.1	0.00	0.01	0.00	49.8
East: Garden Ave (westbound)															
4	L2	All MCs	1	2.8	1	2.8	0.011	4.7	LOS A	0.0	0.3	0.18	0.51	0.18	40.8
5	T1	All MCs	1	2.8	1	2.8	0.011	3.7	LOS A	0.0	0.3	0.18	0.51	0.18	42.2
6	R2	All MCs	9	2.8	9	2.8	0.011	5.1	LOS A	0.0	0.3	0.18	0.51	0.18	42.5
Approach			12	2.8	12	2.8	0.011	4.9	LOS A	0.0	0.3	0.18	0.51	0.18	42.4
North: Pine Ave (southbound)															
7	L2	All MCs	2	2.8	2	2.8	0.018	4.8	LOS A	0.0	0.3	0.08	0.15	0.08	46.2
8	T1	All MCs	25	2.8	25	2.8	0.018	0.1	LOS A	0.0	0.3	0.08	0.15	0.08	48.4
9	R2	All MCs	6	2.8	6	2.8	0.018	4.8	LOS A	0.0	0.3	0.08	0.15	0.08	46.6
Approach			34	2.8	34	2.8	0.018	1.3	NA	0.0	0.3	0.08	0.15	0.08	47.9
West: Garden Avenue (eastbound)															
10	L2	All MCs	2	2.8	2	2.8	0.015	4.8	LOS A	0.0	0.4	0.20	0.51	0.20	43.6
11	T1	All MCs	1	2.8	1	2.8	0.015	3.7	LOS A	0.0	0.4	0.20	0.51	0.20	42.1
12	R2	All MCs	13	2.8	13	2.8	0.015	5.1	LOS A	0.0	0.4	0.20	0.51	0.20	41.9
Approach			16	2.8	16	2.8	0.015	5.0	LOS A	0.0	0.4	0.20	0.51	0.20	42.2
All Vehicles			142	2.8	142	2.8	0.040	1.3	NA	0.0	0.4	0.06	0.14	0.06	47.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Organisation: INGEN CONSULTING PTY LTD | Licence: PLUS / 1PC | Processed: Monday, 26 February 2024 12:38:42 PM
Project: V:\5. Jobs\J1295_30 Chinbible Avenue\4 - Modelling\SIDRA\J1295_SIDRA.sip9

MOVEMENT SUMMARY

Site: 101 [Pine Ave / Garden Ave - Sc 1 2024 background - PM (Site Folder: Pine Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pine Ave (northbound)															
1	L2	All MCs	1	2.8	1	2.8	0.023	4.6	LOS A	0.0	0.1	0.01	0.03	0.01	47.3
2	T1	All MCs	43	2.8	43	2.8	0.023	0.0	LOS A	0.0	0.1	0.01	0.03	0.01	49.7
3	R2	All MCs	1	2.8	1	2.8	0.023	4.6	LOS A	0.0	0.1	0.01	0.03	0.01	46.3
Approach			45	2.8	45	2.8	0.023	0.2	NA	0.0	0.1	0.01	0.03	0.01	49.6
East: Garden Ave (westbound)															
4	L2	All MCs	1	2.8	1	2.8	0.011	4.7	LOS A	0.0	0.3	0.19	0.52	0.19	40.7
5	T1	All MCs	1	2.8	1	2.8	0.011	3.7	LOS A	0.0	0.3	0.19	0.52	0.19	42.2
6	R2	All MCs	9	2.8	9	2.8	0.011	5.1	LOS A	0.0	0.3	0.19	0.52	0.19	42.5
Approach			12	2.8	12	2.8	0.011	4.9	LOS A	0.0	0.3	0.19	0.52	0.19	42.3
North: Pine Ave (southbound)															
7	L2	All MCs	12	2.8	12	2.8	0.037	4.7	LOS A	0.1	0.6	0.06	0.19	0.06	45.9
8	T1	All MCs	47	2.8	47	2.8	0.037	0.0	LOS A	0.1	0.6	0.06	0.19	0.06	48.1
9	R2	All MCs	13	2.8	13	2.8	0.037	4.7	LOS A	0.1	0.6	0.06	0.19	0.06	46.3
Approach			72	2.8	72	2.8	0.037	1.6	NA	0.1	0.6	0.06	0.19	0.06	47.4
West: Garden Avenue (eastbound)															
10	L2	All MCs	2	2.8	2	2.8	0.010	4.7	LOS A	0.0	0.2	0.17	0.50	0.17	43.8
11	T1	All MCs	1	2.8	1	2.8	0.010	3.7	LOS A	0.0	0.2	0.17	0.50	0.17	42.3
12	R2	All MCs	7	2.8	7	2.8	0.010	5.1	LOS A	0.0	0.2	0.17	0.50	0.17	42.1
Approach			11	2.8	11	2.8	0.010	4.9	LOS A	0.0	0.2	0.17	0.50	0.17	42.5
All Vehicles			139	2.8	139	2.8	0.037	1.7	NA	0.1	0.6	0.06	0.19	0.06	47.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Organisation: INGEN CONSULTING PTY LTD | Licence: PLUS / 1PC | Processed: Monday, 26 February 2024 12:42:09 PM
Project: V:\5. Jobs\J1295_30 Chinbible Avenue\4 - Modelling\SIDRA\J1295_SIDRA.sip9

MOVEMENT SUMMARY

Site: 101 [Pine Ave / Garden Ave - Sc 1 2034 background - AM (Site Folder: Pine Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pine Ave (northbound)															
1	L2	All MCs	1	2.8	1	2.8	0.054	4.6	LOS A	0.0	0.1	0.00	0.01	0.00	47.5
2	T1	All MCs	106	2.8	106	2.8	0.054	0.0	LOS A	0.0	0.1	0.00	0.01	0.00	49.9
3	R2	All MCs	1	2.8	1	2.8	0.054	4.6	LOS A	0.0	0.1	0.00	0.01	0.00	46.5
Approach			108	2.8	108	2.8	0.054	0.1	NA	0.0	0.1	0.00	0.01	0.00	49.8
East: Garden Ave (westbound)															
4	L2	All MCs	1	2.8	1	2.8	0.015	4.7	LOS A	0.0	0.4	0.22	0.52	0.22	40.6
5	T1	All MCs	1	2.8	1	2.8	0.015	3.9	LOS A	0.0	0.4	0.22	0.52	0.22	42.1
6	R2	All MCs	13	2.8	13	2.8	0.015	5.3	LOS A	0.0	0.4	0.22	0.52	0.22	42.4
Approach			15	2.8	15	2.8	0.015	5.2	LOS A	0.0	0.4	0.22	0.52	0.22	42.3
North: Pine Ave (southbound)															
7	L2	All MCs	3	2.8	3	2.8	0.024	4.8	LOS A	0.1	0.4	0.10	0.16	0.10	46.1
8	T1	All MCs	34	2.8	34	2.8	0.024	0.1	LOS A	0.1	0.4	0.10	0.16	0.10	48.3
9	R2	All MCs	8	2.8	8	2.8	0.024	4.9	LOS A	0.1	0.4	0.10	0.16	0.10	46.5
Approach			45	2.8	45	2.8	0.024	1.3	NA	0.1	0.4	0.10	0.16	0.10	47.8
West: Garden Avenue (eastbound)															
10	L2	All MCs	3	2.8	3	2.8	0.021	4.9	LOS A	0.1	0.5	0.24	0.52	0.24	43.5
11	T1	All MCs	1	2.8	1	2.8	0.021	3.9	LOS A	0.1	0.5	0.24	0.52	0.24	42.0
12	R2	All MCs	17	2.8	17	2.8	0.021	5.3	LOS A	0.1	0.5	0.24	0.52	0.24	41.8
Approach			21	2.8	21	2.8	0.021	5.2	LOS A	0.1	0.5	0.24	0.52	0.24	42.1
All Vehicles			189	2.8	189	2.8	0.054	1.3	NA	0.1	0.5	0.07	0.14	0.07	47.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

Organisation: INGEN CONSULTING PTY LTD | Licence: PLUS / 1PC | Processed: Monday, 26 February 2024 12:43:33 PM
Project: V:\5. Jobs\J1295_30 Chinbible Avenue\4 - Modelling\SIDRA\J1295_SIDRA.sip9

MOVEMENT SUMMARY

Site: 101 [Pine Ave / Garden Ave - Sc 1 2034 background - PM (Site Folder: Pine Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pine Ave (northbound)															
1	L2	All MCs	1	2.8	1	2.8	0.030	4.6	LOS A	0.0	0.1	0.01	0.02	0.01	47.4
2	T1	All MCs	58	2.8	58	2.8	0.030	0.0	LOS A	0.0	0.1	0.01	0.02	0.01	49.8
3	R2	All MCs	1	2.8	1	2.8	0.030	4.6	LOS A	0.0	0.1	0.01	0.02	0.01	46.4
Approach			60	2.8	60	2.8	0.030	0.2	NA	0.0	0.1	0.01	0.02	0.01	49.7
East: Garden Ave (westbound)															
4	L2	All MCs	1	2.8	1	2.8	0.015	4.8	LOS A	0.0	0.3	0.23	0.53	0.23	40.5
5	T1	All MCs	1	2.8	1	2.8	0.015	3.9	LOS A	0.0	0.3	0.23	0.53	0.23	42.0
6	R2	All MCs	13	2.8	13	2.8	0.015	5.3	LOS A	0.0	0.3	0.23	0.53	0.23	42.3
Approach			15	2.8	15	2.8	0.015	5.1	LOS A	0.0	0.3	0.23	0.53	0.23	42.2
North: Pine Ave (southbound)															
7	L2	All MCs	16	2.8	16	2.8	0.050	4.7	LOS A	0.1	0.9	0.07	0.19	0.07	45.9
8	T1	All MCs	63	2.8	63	2.8	0.050	0.1	LOS A	0.1	0.9	0.07	0.19	0.07	48.0
9	R2	All MCs	17	2.8	17	2.8	0.050	4.8	LOS A	0.1	0.9	0.07	0.19	0.07	46.3
Approach			96	2.8	96	2.8	0.050	1.6	NA	0.1	0.9	0.07	0.19	0.07	47.3
West: Garden Avenue (eastbound)															
10	L2	All MCs	3	2.8	3	2.8	0.013	4.7	LOS A	0.0	0.3	0.20	0.51	0.20	43.6
11	T1	All MCs	1	2.8	1	2.8	0.013	3.9	LOS A	0.0	0.3	0.20	0.51	0.20	42.1
12	R2	All MCs	9	2.8	9	2.8	0.013	5.2	LOS A	0.0	0.3	0.20	0.51	0.20	42.0
Approach			14	2.8	14	2.8	0.013	5.0	LOS A	0.0	0.3	0.20	0.51	0.20	42.4
All Vehicles			184	2.8	184	2.8	0.050	1.7	NA	0.1	0.9	0.07	0.19	0.07	47.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Pine Ave / Garden Ave - Sc 1 2034 combined- AM (Site Folder: Pine Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pine Ave (northbound)															
1	L2	All MCs	1	2.8	1	2.8	0.054	4.6	LOS A	0.0	0.1	0.00	0.01	0.00	47.5
2	T1	All MCs	106	2.8	106	2.8	0.054	0.0	LOS A	0.0	0.1	0.00	0.01	0.00	49.9
3	R2	All MCs	1	2.8	1	2.8	0.054	4.6	LOS A	0.0	0.1	0.00	0.01	0.00	46.5
Approach			108	2.8	108	2.8	0.054	0.1	NA	0.0	0.1	0.00	0.01	0.00	49.8
East: Garden Ave (westbound)															
4	L2	All MCs	1	2.8	1	2.8	0.015	4.7	LOS A	0.0	0.4	0.22	0.52	0.22	40.6
5	T1	All MCs	1	2.8	1	2.8	0.015	3.9	LOS A	0.0	0.4	0.22	0.52	0.22	42.0
6	R2	All MCs	13	2.8	13	2.8	0.015	5.3	LOS A	0.0	0.4	0.22	0.52	0.22	42.4
Approach			15	2.8	15	2.8	0.015	5.2	LOS A	0.0	0.4	0.22	0.52	0.22	42.2
North: Pine Ave (southbound)															
7	L2	All MCs	3	2.8	3	2.8	0.027	4.9	LOS A	0.1	0.6	0.13	0.21	0.13	45.7
8	T1	All MCs	34	2.8	34	2.8	0.027	0.1	LOS A	0.1	0.6	0.13	0.21	0.13	47.8
9	R2	All MCs	14	2.8	14	2.8	0.027	4.9	LOS A	0.1	0.6	0.13	0.21	0.13	46.1
Approach			51	2.8	51	2.8	0.027	1.7	NA	0.1	0.6	0.13	0.21	0.13	47.2
West: Garden Avenue (eastbound)															
10	L2	All MCs	3	2.8	3	2.8	0.022	4.9	LOS A	0.1	0.5	0.24	0.53	0.24	43.5
11	T1	All MCs	1	2.8	1	2.8	0.022	3.9	LOS A	0.1	0.5	0.24	0.53	0.24	41.9
12	R2	All MCs	18	2.8	18	2.8	0.022	5.3	LOS A	0.1	0.5	0.24	0.53	0.24	41.8
Approach			22	2.8	22	2.8	0.022	5.2	LOS A	0.1	0.5	0.24	0.53	0.24	42.1
All Vehicles			196	2.8	196	2.8	0.054	1.5	NA	0.1	0.6	0.08	0.16	0.08	47.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.

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

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

Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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MOVEMENT SUMMARY

Site: 101 [Pine Ave / Garden Ave - Sc 1 2034 combined - PM (Site Folder: Pine Avenue)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New Site
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Pine Ave (northbound)															
1	L2	All MCs	2	2.8	2	2.8	0.031	4.6	LOS A	0.0	0.1	0.01	0.03	0.01	47.3
2	T1	All MCs	58	2.8	58	2.8	0.031	0.0	LOS A	0.0	0.1	0.01	0.03	0.01	49.7
3	R2	All MCs	1	2.8	1	2.8	0.031	4.6	LOS A	0.0	0.1	0.01	0.03	0.01	46.3
Approach			61	2.8	61	2.8	0.031	0.2	NA	0.0	0.1	0.01	0.03	0.01	49.6
East: Garden Ave (westbound)															
4	L2	All MCs	1	2.8	1	2.8	0.015	4.8	LOS A	0.0	0.4	0.24	0.53	0.24	40.5
5	T1	All MCs	1	2.8	1	2.8	0.015	3.9	LOS A	0.0	0.4	0.24	0.53	0.24	42.0
6	R2	All MCs	13	2.8	13	2.8	0.015	5.3	LOS A	0.0	0.4	0.24	0.53	0.24	42.3
Approach			15	2.8	15	2.8	0.015	5.2	LOS A	0.0	0.4	0.24	0.53	0.24	42.2
North: Pine Ave (southbound)															
7	L2	All MCs	16	2.8	16	2.8	0.055	4.7	LOS A	0.2	1.2	0.10	0.22	0.10	45.5
8	T1	All MCs	63	2.8	63	2.8	0.055	0.1	LOS A	0.2	1.2	0.10	0.22	0.10	47.7
9	R2	All MCs	25	2.8	25	2.8	0.055	4.8	LOS A	0.2	1.2	0.10	0.22	0.10	46.0
Approach			104	2.8	104	2.8	0.055	1.9	NA	0.2	1.2	0.10	0.22	0.10	46.9
West: Garden Avenue (eastbound)															
10	L2	All MCs	3	2.8	3	2.8	0.014	4.7	LOS A	0.0	0.3	0.21	0.51	0.21	43.6
11	T1	All MCs	1	2.8	1	2.8	0.014	3.9	LOS A	0.0	0.3	0.21	0.51	0.21	42.1
12	R2	All MCs	11	2.8	11	2.8	0.014	5.3	LOS A	0.0	0.3	0.21	0.51	0.21	41.9
Approach			15	2.8	15	2.8	0.014	5.1	LOS A	0.0	0.3	0.21	0.51	0.21	42.4
All Vehicles			195	2.8	195	2.8	0.055	1.9	NA	0.2	1.2	0.09	0.21	0.09	47.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options 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 (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).
Two-Way Sign Control Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

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