

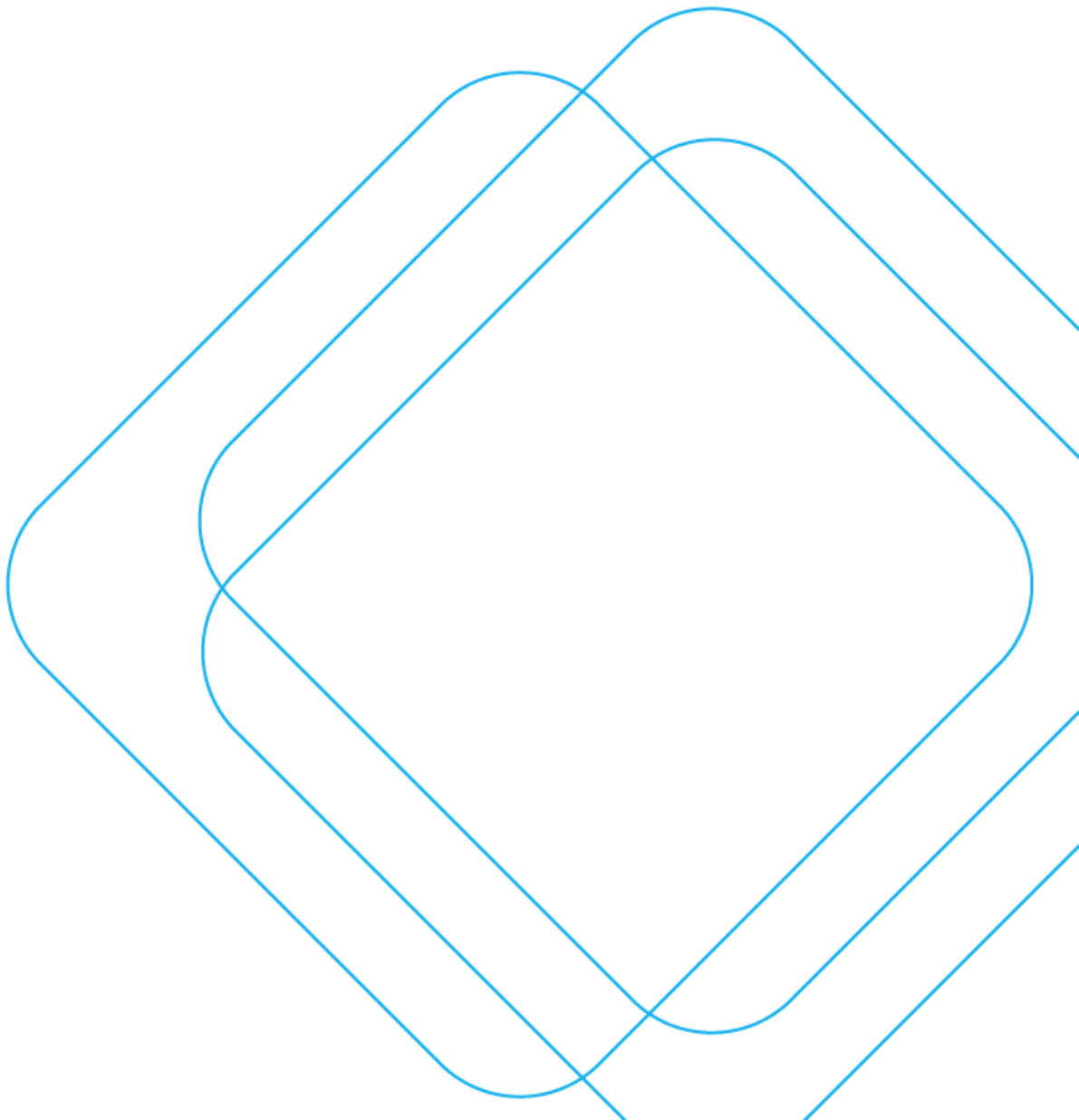
ANAMBAH MANUFACTURED HOME ESTATE

Traffic Impact Assessment

13 DECEMBER 2024



SCT Consulting acknowledges the traditional owners of the lands on which we work.
We pay our respects to Elders past, present and emerging.



Quality Assurance

Project:	Anambah Manufactured Home Estate		
Project Number:	SCT_00669		
Client:	Thirdi Anambah Pty Ltd	ACN:	661 880 619
Prepared by:	SCT Consulting PTY. LTD. (SCT Consulting)	ABN:	53 612 624 058

Information	Name	Position	Signature
Author:	Shawn Cen	Principal Consultant	
Reviewer:	Andy Yung	Director	
Authoriser:	Andy Yung	Director	

Version	Date	Details
1.0	25 November 2024	Draft report
2.0	13 December 2024	Final report



© SCT Consulting PTY LTD (SCT Consulting)

SCT Consulting's work is intended solely for the use of the Client and the scope of work and associated responsibilities outlined in this document. SCT Consulting assumes no liability with respect to any reliance that the client places upon this document. Use of this document by a third party to inform decisions is the sole responsibility of that third party. Any decisions made or actions taken as a result of SCT Consulting's work shall be the responsibility of the parties directly involved in the decisions or actions. SCT Consulting may have been provided information by the client and other third parties to prepare this document which has not been verified. This document may be transmitted, reproduced or disseminated only in its entirety and in accordance with the above.

Contents

Executive summary	i
1.0 Introduction	1
1.1 Background.....	1
1.2 Purpose of this report.....	1
1.3 Report structure	2
2.0 Existing conditions	3
2.1 The site	3
2.2 Road network.....	3
2.3 Public transport	4
2.4 Active transport	5
2.5 Intersection performance	6
2.5.1 Traffic surveys.....	6
2.5.2 Modelling.....	6
2.5.3 Intersection level of service definition	6
2.5.4 Intersection performance	7
3.0 The proposal.....	8
3.1 Proposed development	8
3.2 Visitor parking	9
4.0 Traffic impact assessment	10
4.1 Trip generation and distribution	10
4.2 Road network impact	10
4.2.1 Intersection on New England Highway	10
4.2.2 Access Road to 559 Anambah Road residential subdivision	12
4.3 Active transport	12
4.4 Public transport	12
5.0 Conclusion.....	13
Appendix A SIDRA output	

Executive Summary

SCT Consulting has been engaged by Thirdi Anambah Pty Ltd to prepare a Traffic Impact Assessment for a proposed Manufactured Housing Estate (MHE) development application (DA) adjacent to the west of 599 Anambah Road Gosforth, in Maitland City Local Government Area (LGA).

The proposed site is zoned RU2 Rural Landscaped which is proposed to create 331 relocatable homes within a Land Lease Community, with associated roads and services. The site will gain access from Anambah Road via the two entrance / exit roads connected with the proposed network as part of the residential subdivision at 599 Anambah Road, i.e. Road No 03 and Road 15. The target occupants are expected to be over 55s senior living community.

The north-south road forms the major access road (8.5m wide) in the site area. They are further extended as perimeter roads (8m wide) across the site. Lower hierarchy roads such as minor access roads (6m wide) are provided to ensure connectivity and permeability for individual lots. The site gains strategic access through entrance / exit roads (8m wide) leading to the adjacent subdivision to the east, and subsequently Anambah Road and further to the New England Highway, which allows for all movements in and out.

Visitor parking is proposed at multiple locations, which satisfy the Local Government Regulation:

- Perpendicular parking at two club houses near the two entrance/exit roads (6 + 9 spaces) including four accessible parking spaces.
- Parallel parking on the perimeter road within the site (about 66 spaces).
- Caravan car park (31 spaces)

Given the access of the proposed MHE will fully rely on the neighbouring 559 Anambah Road residential subdivision, SIDRA modelling for this study is developed based on the neighbouring residential subdivision to the east where the assumptions are consistent with what have been agreed with TfNSW in the 559 Anambah Road residential development application. The worst case has been selected to form 2038 future year base case for this study and also considered with the cumulative impact of the 559 Anambah Road residential development application.

The latest *Guide to Transport Impact Assessment* (GTIA) states that for senior housing, peak travel generally does not coincide with morning network peak but there is a closer correlation between evening site peaks and network peak. Hence, only PM peak hour on a weekday is considered. According to the GTIA, the vehicle trip rate for housing for seniors in regional NSW is 0.23 trips per lot per hour, resulting in a total of 76 vehicle trips during the PM peak hour.

It is noted that for future year base case (without any of this subject but with the 559 Anambah Road residential development application and Lochinvar URA), infrastructure upgrade would be required due to the background traffic growth specific by TfNSW at the intersection of New England Highway / Anambah Road. The proposed upgrade will include:

- Signalisation of the intersection
- Duplication of the west approach and exit
- Additional eastbound left and right turn bay of the New England Highway
- High angle slip lane for left turners on the southbound Anambah Road and additional southbound right turn bay of Anambah Road
- High angle slip lane for left turners on the westbound approach of the New England Highway and additional westbound right turn bays of the New England Highway.

The proposal will only result in a limited increase in additional intersection delay and will maintain the level of service at the same level as the base case. It has no major impact on the operational level of service on the road network. No further upgrade is required as a result of this proposed MHE development.

The modelling result also indicates that there is no capacity issue at the proposed Anambah Road access point considering a cumulative impact of the residential subdivision and the proposal.

The study concludes that the impacts of the proposed development are at a level able to be accommodated by the existing and proposed infrastructure.

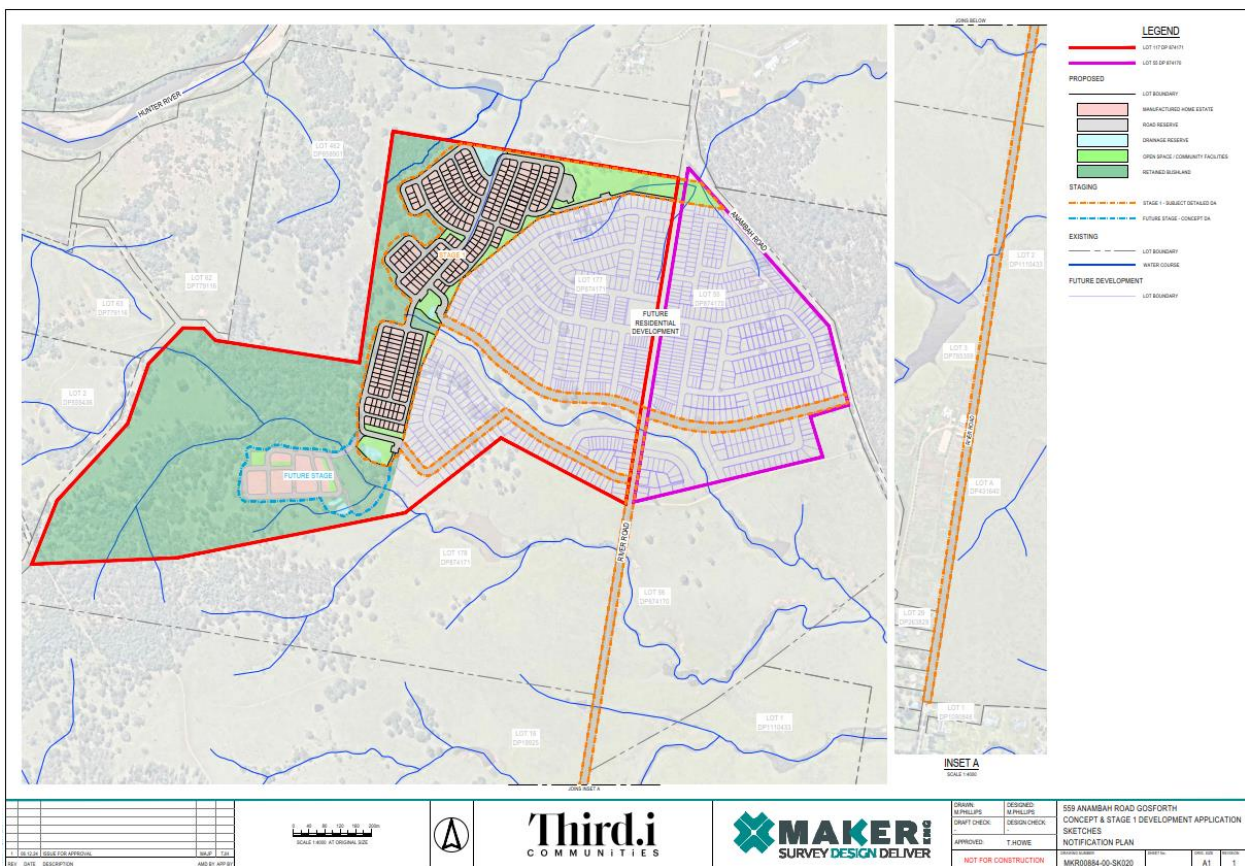
1.0 Introduction

1.1 Background

SCT Consulting has been engaged by Thirdi Anambah Pty Ltd to prepare a Traffic Impact Assessment for a proposed Manufactured Home Estate (MHE) development application (DA) at 599 Anambah Road Gosforth, in Maitland City Local Government Area (LGA). The site is to the west of the proposed residential subdivision which is expected to accommodate 900 dwellings.

As shown in **Figure 1-1**, the site is located in the northernmost portion of the Anambah Urban Release Area (URA). It is currently RU2 Rural Landscape zoned land, which is located around 10km to the northwest of Maitland City Centre and 5km to the New England Highway. The MHE will deliver 331 relocatable homes within a Land Lease Community.

Figure 1-1 Proposed master plan



Source: Maker Eng, 2024

1.2 Purpose of this report

SCT Consulting has assessed traffic impacts to support the development application. The report includes the following:

- A review of existing traffic and transport conditions
- Traffic data collection during the weekday morning and afternoon peak periods for the intersection of Anambah Road / New England Highway
- Future vehicle trip generation from the proposed development and surrounding urban growth area and distribution of the trips to the surrounding road network based on preferred access strategies and travel patterns
- SIDRA intersection modelling for the scenario in line with what has been requested by TfNSW in previous development applications
- Assessment of cumulative impacts on the road, active transport, and public transport network

- Evaluation of the consistency of the proposed road cross-sections as part of this DA with relevant guidelines.

1.3 Report structure

The report comprises the following sections:

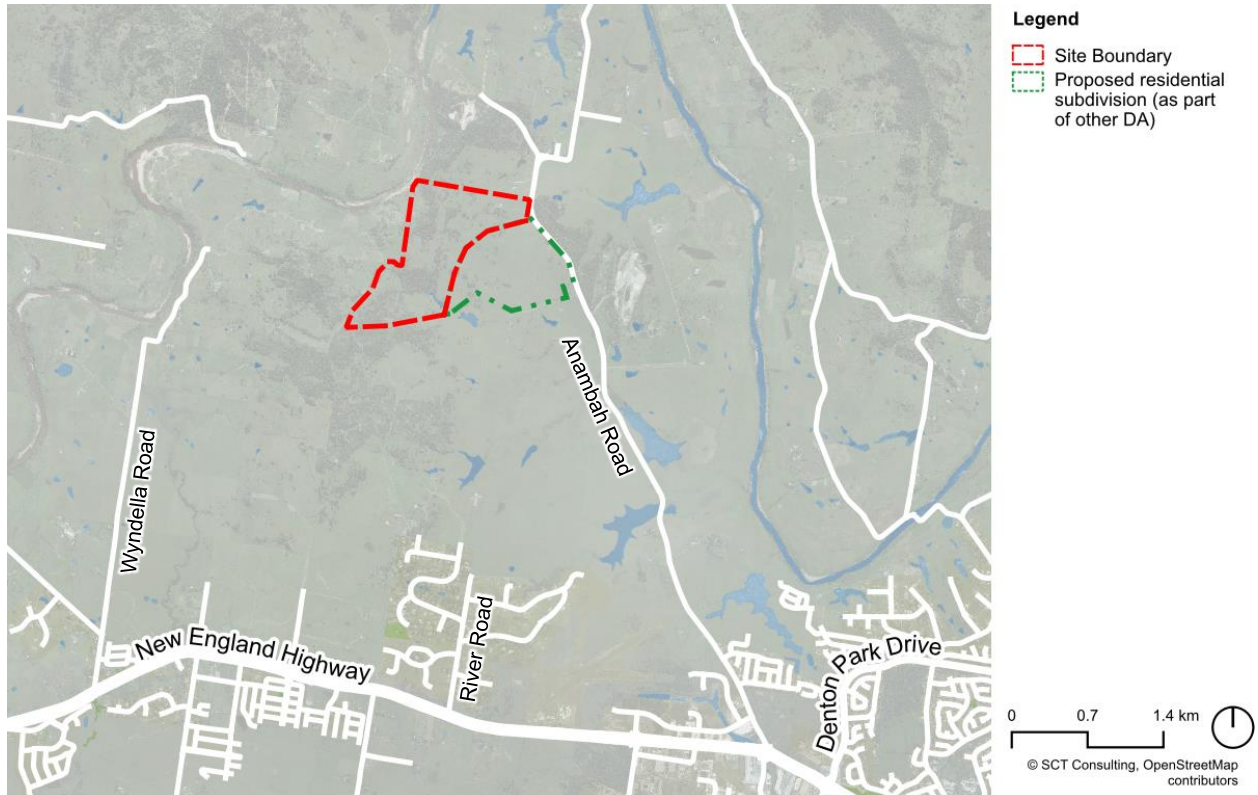
- **Section 2** describes the existing transport conditions for all modes of transport.
- **Section 3** describes the proposed development, including its access strategy and proposed road network.
- **Section 4** assesses the estimated trips generated, their distribution based on the preferred access strategy, and the likely traffic impacts associated with the additional trips.
- **Section 5** summarises the report and presents the conclusion.

2.0 Existing conditions

2.1 The site

The proposed development is located in the northernmost portion of Anambah URA in the west portion of 559 Anambah Road, bounded to the east by the proposed residential development (**Figure 2-1**). The site is predominantly rural land with small vegetation patches across the central and northern parts of the site.

Figure 2-1 Site context

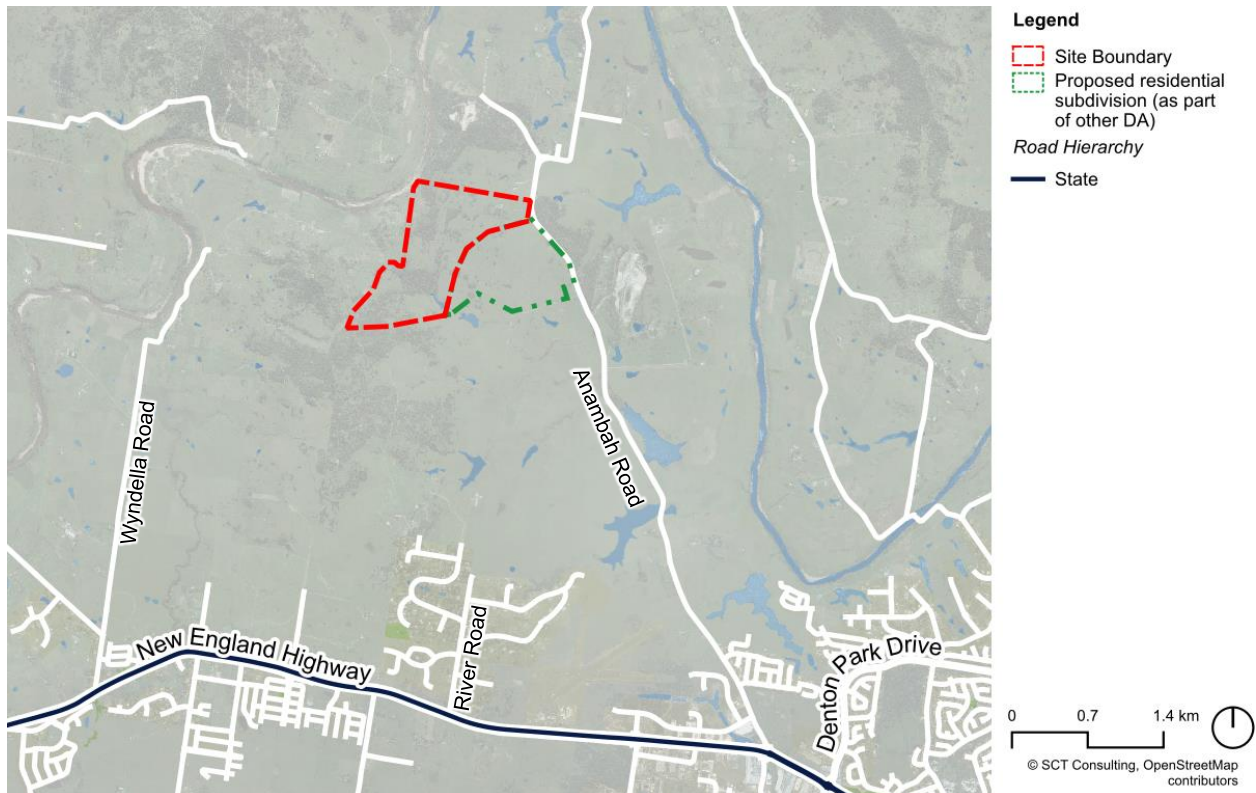


Source: Nearmap, 2024

2.2 Road network

The road network in the vicinity of the site is shown in **Figure 2-2** where New England Highway is a classified State road and other roads are all Local roads. New England Highway connects to Maitland and through onto Newcastle to the east. To the west, it connects to Branxton. There are interchanges with the M15 Hunter Expressway via Allandale Road and Lovedale Road at Allandale.

Figure 2-2 Classified state and regional road network



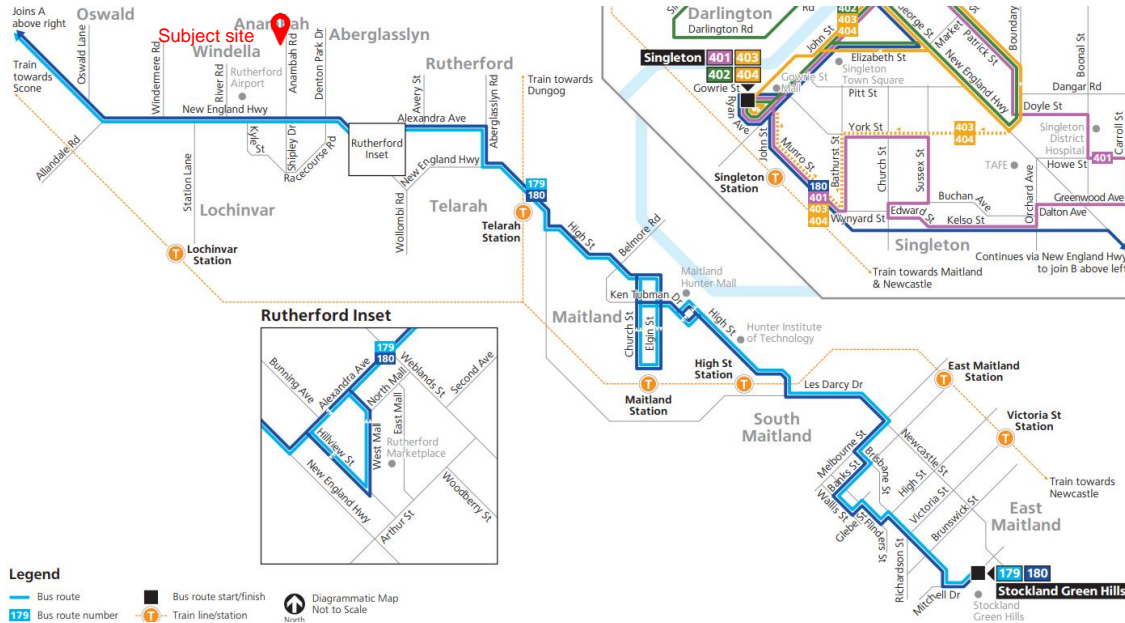
Source: Transport for NSW, 2024

- **New England Highway** is a state road, classified as a primary road. It would provide the main access for residents to the site in all directions. It generally varies between one and two lanes with no on-street parking provided. Speed limit also varies from 40 and 50 km/h in urban areas and school zones to 90 km/h west of Lochinvar. The New England Highway provides key connections to the Hunter Expressway and Pacific Highway / Motorway.
- **Anambah Road** is a local rural road, which is the only existing road connected to the site. The speed limit is 100 km/h and one travel lane is available in each direction. No formal on-street parking is provided, however, in some locations, there is sufficient shoulder width for vehicles to park. No kerb or gutter is currently in place along the road. Anambah Road connects to the New England Highway at a dual-lane roundabout in Rutherford.
- **River Road** is a local two-lane road, providing access to the nearby suburb of Windella. The speed limit is 50 km/h and no on-street parking is provided, however, there would be space to park on the road shoulder at places along its length. The formed section of River Road is currently 1.3km in length and ends at a turnaround point to the north. River Road connects to the New England Highway with a priority (give-way) intersection. There is an unformed section of River Road from the northern extent of the formed section of River Road and the southern boundary of the Site.

2.3 Public transport

The closest bus stop is on Anambah Road before Cagney Road where Route 178 (Loop service Rutherford to Anambah Road) is running at 11 services per day. Other bus stops on New England Highway are 600m to the west of the Anambah Road roundabout where Routes 179 and 180 follow a similar route (Maitland and Stockland Green Hills). The frequency is approximately hourly from 8 am to 6 pm (**Figure 2-3**). Two school bus routes (2481 and 2482) are provided along Anambah Road.

Figure 2-3 Public transport network



Source: Transport for NSW, 2023

Lochinvar Station is 7km to the southwest of the site. There are no feeder bus routes to this station. Lochinvar Station is served by the Hunter Line, which has an approximately hourly frequency from 7am to 10pm. The Hunter Line connects Lochinvar to Newcastle Interchange and Scone.

2.4 Active transport

There are no dedicated active transport facilities located near the site. With a lack of footpaths along any local roads, pedestrians and cyclists are required to utilise road shoulders or the roadway if they need to walk or cycle.

The walking and cycling infrastructure along New England Highway is shown in **Figure 2-4** and **Figure 2-5**.

Figure 2-4 Walking and cycling infrastructure – Anambah Road/ New England Highway



Source: Nearthmaps, SCT Consulting, 2024

There are shared paths on all legs of the New England Highway/ Anambah Road roundabout. There are wide shoulders along New England Highway that would be suitable for experienced cyclists.

Figure 2-5 Walking and cycling infrastructure – Wyndella Road/ New England Highway



Source: Nearmaps, SCT Consulting, 2024

There is a footpath within the subdivision area to the south of the New England Highway with crossings on all legs of New England Highway/ Wyndella Road.

There are on-road cycle lanes on the eastern, western and southern approaches to New England Highway/ Wyndella Road. There are wide shoulders along New England Highway that would be suitable for experienced cyclists. A shared path runs along the western side of Springfield Drive south of New England Highway.

2.5 Intersection performance

To determine the impact of the development on future traffic, the current performance of nearby intersections should be understood. The key intersection to this project was identified as New England Highway / Anambah Road / Shipley Drive (roundabout) because the subject site will only be accessed via Anambah Road.

2.5.1 Traffic surveys

Intersection turning count surveys were undertaken at the roundabout on 11 October 2023 (Wednesday). Surveys were conducted between 7am-9am and 3pm-5pm to capture typical weekday peak periods. The survey was within the school term and collected turning counts of light and heavy vehicles within fifteen-minute intervals. Queue lengths were also collected in five-minute intervals for calibration.

2.5.2 Modelling

Intersections were modelled in SIDRA 9.1. SIDRA models the delay to road users based on demands and geometry of intersections, it is a typical software used for developments of this scale. Queue lengths were used to calibrate the model.

2.5.3 Intersection level of service definition

Intersection Level of Service (LoS) is a typical measure used by traffic engineers to identify when roads are congested. The Level of Service, as defined in TfNSW Traffic Modelling Guidelines, is provided in **Table 2-1**.

Table 2-1 Level of Service definitions

Level of Service	Average delay per vehicle	Performance explanation
A	Less than 14.5s	Good operation
B	14.5s to 28.4s	Good with acceptable delays and spare capacity
C	28.5s to 42.4s	Satisfactory
D	42.5s to 56.4s	Operating near capacity
E	56.5s to 70.4s	At capacity. At signals incidents will cause excessive delays. Roundabouts require another control method.
F	70.5s or greater	At capacity. At signals incidents will cause excessive delays. Roundabouts require another control method.

Source: Roads and Maritime Services (2002), Traffic Modelling Guidelines

In addition, the following measure of performance is included to complement the Level of Service measure:

- **Degree of Saturation (DoS):** a measure of the volume/capacity for the worst turning movement at the intersection. A DoS of 1.0 implies the turning movement is at capacity.

2.5.4 Intersection performance

The performance of the intersection is presented in **Table 2-2**:

Table 2-2 2023 existing intersection performance

Intersection	Delay	LoS	DoS	Delay	LoS	DoS
	Weekday AM peak			Weekday PM peak		
New England Highway / Anambah Road / Shipley Drive	17.5s	B	0.47	16.5s	B	0.54

Traffic modelling confirms that there are no existing capacity issues at the intersection. It is currently operating satisfactorily with limited delay and excess capacity for some future growth.

SIDRA output summaries are documented in **Appendix A**.

3.0 The proposal

3.1 Proposed development

The proposed site is zoned RU2 Rural Landscaped which is proposed to utilise to create 331 relocatable homes within a Land Lease Community, with associated roads and services.

It is proposed to deliver community facilities such as a Clubhouse, secondary community hub, half lawn bowling green, pool, tennis court, pickleball court, 8*12 maintenance shed, 4*8 mens shed, dog exercise area and community garden. The layout plan is based on a grid road network containing different road hierarchies. The target occupants are expected to be over 55s senior living community.

Figure 3-1 Proposed road hierarchies



Source: Maker Eng, 2024

The site gains strategic access through the proposed entrance / exit roads (8m wide), that connect with the adjacent subdivision to the east (as part of the 559 Anambah Road DA), and then onto Anambah Road and further to the New England Highway, which allows for all movements in and out.

The north-south road forms the major access road (8.5m wide) in the site area. They are further extended as perimeter roads (8m wide) across the site. Lower hierarchy roads (minor roads 6m wide) are provided to ensure connectivity and permeability for individual lots. Street cross-section

The Local Government Regulation defines the requirements for street cross sections for the proposal (**Table 3-1**).

Table 3-1 Street cross sections for different road types

Road Type	Width of road
Entrance and exit roads	<ul style="list-style-type: none"> – A road forming an entrance to or exit for a manufactured home estate must be at least 8 metres wide – For divided road, the width of the sealed portion of the road on either side of the median strip must be at least 5 metres.
Major Access	<ul style="list-style-type: none"> – 8.5 metres – 6 metres (sealed portion) – 8.5 metres (sealed portion at a passing or parking bay)
Minor Access	<ul style="list-style-type: none"> – 6 metres – 4 metres (sealed portion) – 6 metres (sealed portion at a passing or parking bay)

Source: NSW Local Government Regulations, 2024

The proposed road sections as shown following the requirements of the NSW Local Government Regulations (**Table 3-2**).

Table 3-2 Proposed road sections

Road No.	Road width	Road Classification
03, 15	8m	Entrance / exit road
01	8.5m	Major access road with shared path
01, 03, 04, 05, 07, 10, 11, 13	8m	Perimeter road with shared path
01, 02, 04, 06, 08, 09, 12, 14, 16, 17, 19, 20	6m	Minor access road

3.2 Visitor parking

Visitor parking is proposed at below locations:

- Perpendicular parking at two club houses near the two entrance/exit roads (6 + 9 spaces) including four accessible parking spaces.
- Parallel parking on perimeter road within the site (about 66 spaces).
- Caravan car park (31 spaces)

The NSW Local Government Regulations specifies that for MHE over 105 sites, 20 spaces plus 1 additional space every 7 sites above 140 is required. This results in a total of 48 visitor parking spaces required.

The provision of visitor parking is considered sufficient, and the four accessible parking spaces is compliant.

4.0 Traffic impact assessment

4.1 Trip generation and distribution

Given the access of the proposed MHE will fully rely on the neighbouring 559 Anambah Road residential subdivision, SIDRA modelling for this study is developed based on the neighbouring residential subdivision to the east where the assumptions are consistent with what have been agreed with TfNSW in the residential development application. The worst-case has been selected to form the future year base case for this study, including:

- Future year in 2038
- A total of 900 dwellings are proposed at 599 Anambah Road with an urban release of 300 lots per annum in Lochinvar Urban Release Area (including a window of 14 years from now)
- Three per cent of annual growth for traffic growth on New England Highway on top of the above cumulative residential development
- *Guide to Transport Impact Assessment (GTIA)* states that for senior housing, peak travel generally does not coincide with morning network peak but there is a closer correlation between evening site peaks and network peak. Hence, only PM peak hour on a weekday is considered.
- The modelling for the residential subdivision confirms that a 70%(west): 30%(east) distribution of the residential development traffic on New England Highway is the worst-case scenario compared to 50%(west): 50%(east). Hence, only the 70%: 30% distribution is considered.

The trip generation from the proposal is shown in **Table 4-1**. According to GTIA, the vehicle trip rate for housing for seniors in regional NSW is 0.23 trips per lot per hour.

Table 4-1 Trip generation for the proposed development

Expected number of lots	Trip generation rate	PM Peak hour traffic
331 lots	0.23 PM peak hour	+76 trips

4.2 Road network impact

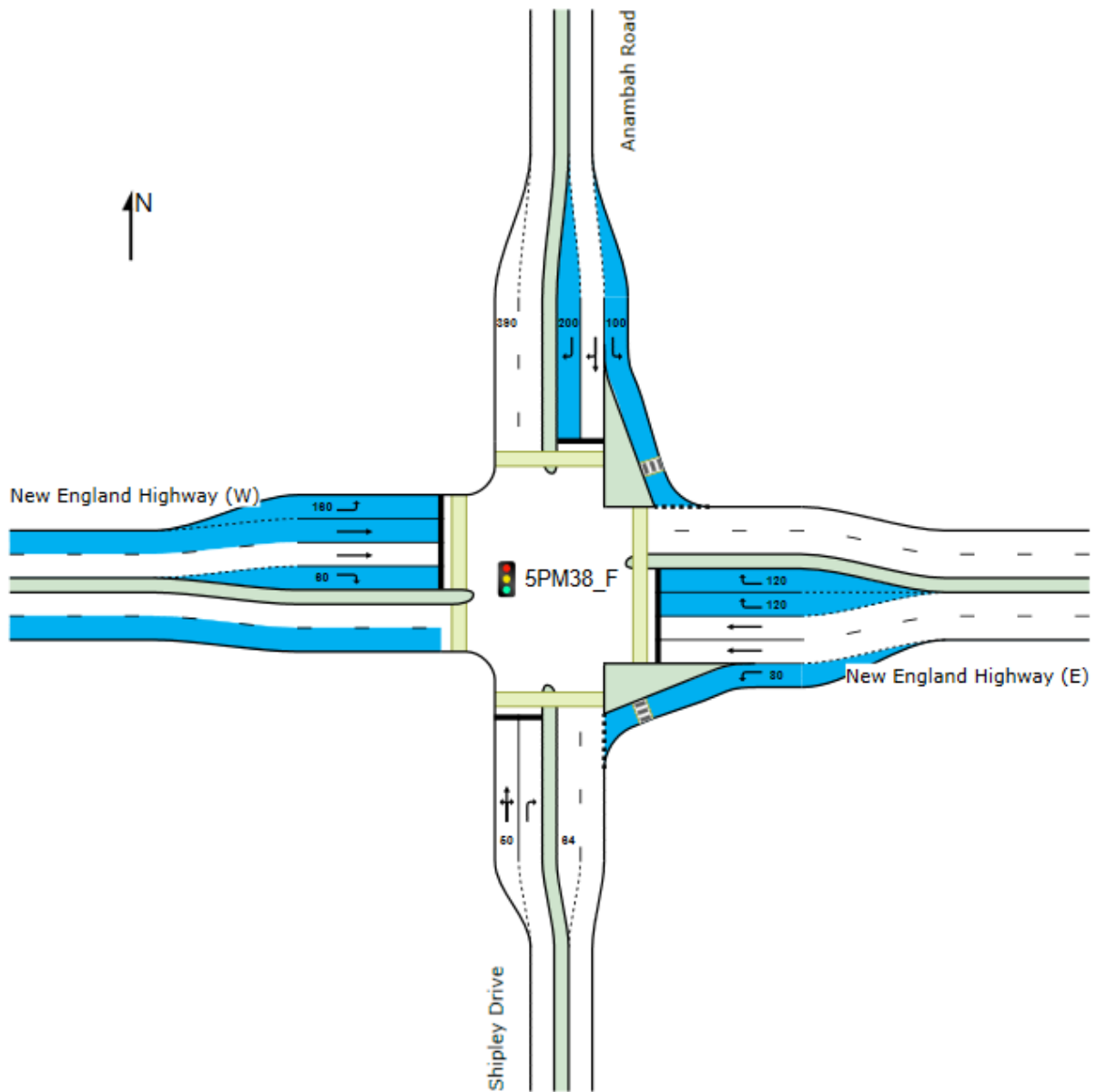
4.2.1 Intersection on New England Highway

SIDRA 9.1 modelling was undertaken for the intersection of New England Highway / Anambah Road / Shipley Drive given it provides strategic access for the proposal. It is noted that for future year base case, infrastructure has been required due to the background traffic growth. The proposed upgrade will include (**Figure 4-1**):

- Signalisation of the intersection
- Duplication of the west approach and exit
- Additional eastbound left and right turn bay of the New England Highway
- High angle slip lane for left turners on the southbound Anambah Road and additional southbound right turn bay of Anambah Road
- High angle slip lane for left turners on the westbound approach of the New England Highway and additional westbound right turn bays of the New England Highway.

Modelling results are shown in **Table 4-2** and detailed SIDRA summary are shown in **Appendix A**. The development will only result in a limited increase in intersection delay and will maintain the level of service at the same level as the base case. It has no major impact on the operational level of service on the road network. No further upgrade is required as a result of this proposal.

Figure 4-1 Proposed intersection upgrade in future year base case 2038



Note that the blue section represents the infrastructure required for the background traffic growth.

Table 4-2 Intersection performances – New England Highway / Anambah Road

Delay	LoS	DoS
Future year base		
54.7s	D	0.93
Future year base + proposal		
55.4s	D	0.93

4.2.2 Access Road to 559 Anambah Road residential subdivision

In line with the intersection modelling for New England Highway, the traffic modelling was undertaken for the Access Road (of 559 Anambah Road) / Anambah Road to make sure there is no capacity issue at the proposed access. The modelling result indicates that there is no capacity issue at the proposed Anambah Road access point considering a cumulative impact of the residential subdivision and the proposal (**Table 4-3**).

Table 4-3 Intersection performances – Access Road

Delay	LoS	DoS
Future year base		
7.8s	A	0.38
Future year base + proposal		
8.3s	A	0.42

4.3 Active transport

A cycle path network is available within the site on major road and periphery roads. This will promote the bicycle use and reduce car mode share for the occupants. Given the nature of the development, it is expected that the proposal will have no significant impact on the active transport network.

4.4 Public transport

Given the nature of the development, it is expected that the public transport demand would be limited, hence no significant impact on the public transport network.

5.0 Conclusion

This traffic impact assessment concluded that:

- The proposed 331 relocatable homes for the over 55s community to the west of the proposed residential subdivision at 559 Anambah Road will generate 76 vehicle trips during the PM peak hour.
- The cross-section requirements per NSW Local Government Regulations are met.
- The proposed visitor parking satisfies the NSW Local Government Regulations.
- The site will gain access from Anambah Road via the two proposed entrance / exit roads connected with the proposed network as part of the residential subdivision at 599 Anambah Road, i.e. Road No 03 and Road 15.
- Given the access of the proposal will fully rely on the neighbouring 559 Anambah Road residential subdivision, SIDRA modelling for this study is developed based on the neighbouring residential subdivision to the east. The worst case has been selected to form the 2038 future year base case for this study.
- For future year base case, an infrastructure upgrade would be required due to the background traffic growth (including 559 Anambah Road subdivision and Lochinvar Urban Release) at the intersection of New England Highway / Anambah Road.
- The proposal will only result in a limited increase in intersection delay and will maintain the level of service at the same level as the base case. It has no major impact on the operational level of service on the road network. No further upgrade is required as a result of this proposed MHE development.

The study concludes that the impacts of the proposed development are at a level able to be accommodated by the existing and proposed infrastructure.

APPENDIX A

SIDRA OUTPUT

MOVEMENT SUMMARY

Site: 5AM_X [NEW_ANA_23_AM_X (Site Folder: BY)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New England Highway / Anambah Road / Shipley Drive

Site Category: (None)

Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV] veh/h	%	[Total HV] veh/h	%				[Veh.] veh	[Dist] m				
South: Shipley Drive															
1	L2	All MCs	43	4.9	43	4.9	0.228	15.3	LOS B	0.9	6.9	0.71	0.81	0.71	48.4
2	T1	All MCs	39	8.1	39	8.1	0.228	13.4	LOS A	1.1	8.1	0.71	0.83	0.71	48.4
3	R2	All MCs	71	10.4	71	10.4	0.228	17.5	LOS B	1.1	8.1	0.71	0.89	0.71	46.6
Approach			153	8.3	153	8.3	0.228	15.8	LOS B	1.1	8.1	0.71	0.85	0.71	47.5
East: New England Highway (E)															
4	L2	All MCs	227	3.2	227	3.2	0.189	3.5	LOS A	1.0	7.1	0.25	0.37	0.25	54.9
5	T1	All MCs	681	7.7	681	7.7	0.239	3.6	LOS A	1.5	11.2	0.24	0.41	0.24	54.4
6	R2	All MCs	198	1.6	198	1.6	0.239	9.6	LOS A	1.5	11.2	0.24	0.42	0.24	53.2
Approach			1106	5.7	1106	5.7	0.239	4.7	LOS A	1.5	11.2	0.24	0.40	0.24	54.3
North: Anambah Road															
7	L2	All MCs	154	8.9	154	8.9	0.282	7.3	LOS A	1.2	9.1	0.67	0.74	0.67	52.7
8	T1	All MCs	34	3.1	34	3.1	0.282	7.8	LOS A	1.2	9.1	0.67	0.80	0.67	51.1
9	R2	All MCs	49	12.8	49	12.8	0.163	15.7	LOS B	0.6	4.7	0.66	0.85	0.66	48.1
Approach			237	8.9	237	8.9	0.282	9.1	LOS A	1.2	9.1	0.67	0.77	0.67	51.4
West: New England Highway (W)															
10	L2	All MCs	27	7.7	27	7.7	0.468	5.8	LOS A	2.6	19.5	0.54	0.51	0.54	53.2
11	T1	All MCs	802	6.4	802	6.4	0.468	5.1	LOS A	2.7	19.8	0.54	0.52	0.54	53.4
12	R2	All MCs	60	8.8	60	8.8	0.468	12.0	LOS A	2.7	19.8	0.54	0.53	0.54	52.1
Approach			889	6.6	889	6.6	0.468	5.6	LOS A	2.7	19.8	0.54	0.52	0.54	53.3
All Vehicles			2385	6.5	2385	6.5	0.468	6.2	LOS A	2.7	19.8	0.43	0.51	0.43	53.1

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.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout 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.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SCT CONSULTING PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 21 November 2024 9:57:23 PM

Project: S:\Projects\SCT_00669_Anambah MHE\4. Tech Work\1. Modelling\SCT_00669_Anambah MHE_SIDRA_v0.1_sc.sip9

MOVEMENT SUMMARY

Site: 5PM_X [NEW_ANA_23_PM_X (Site Folder: BY)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New England Highway / Anambah Road / Shipley Drive

Site Category: (None)

Roundabout

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV] veh/h	%	[Total HV] veh/h	%				[Veh.] veh	[Dist] m				
South: Shipley Drive															
1	L2	All MCs	92	4.6	92	4.6	0.316	11.3	LOS A	1.4	9.9	0.69	0.78	0.72	50.9
2	T1	All MCs	49	4.3	49	4.3	0.316	10.0	LOS A	1.4	9.9	0.69	0.78	0.72	51.3
3	R2	All MCs	306	1.0	306	1.0	0.498	15.8	LOS B	2.9	20.6	0.74	0.90	0.91	47.3
Approach			447	2.1	447	2.1	0.498	14.3	LOS A	2.9	20.6	0.73	0.86	0.85	48.4
East: New England Highway (E)															
4	L2	All MCs	244	3.0	244	3.0	0.336	4.0	LOS A	1.9	13.9	0.35	0.41	0.35	54.4
5	T1	All MCs	635	4.3	635	4.3	0.425	4.0	LOS A	2.8	20.3	0.36	0.43	0.36	54.0
6	R2	All MCs	159	7.3	159	7.3	0.425	10.1	LOS A	2.8	20.3	0.36	0.44	0.36	52.7
Approach			1038	4.5	1038	4.5	0.425	5.0	LOS A	2.8	20.3	0.36	0.43	0.36	53.9
North: Anambah Road															
7	L2	All MCs	283	2.6	283	2.6	0.465	9.1	LOS A	2.7	19.4	0.80	0.88	0.95	51.4
8	T1	All MCs	55	5.8	55	5.8	0.240	10.9	LOS A	1.0	7.2	0.74	0.86	0.74	49.7
9	R2	All MCs	32	3.3	32	3.3	0.240	16.5	LOS B	1.0	7.2	0.74	0.86	0.74	48.9
Approach			369	3.1	369	3.1	0.465	10.0	LOS A	2.7	19.4	0.79	0.87	0.90	50.9
West: New England Highway (W)															
10	L2	All MCs	34	3.1	34	3.1	0.541	7.3	LOS A	3.8	27.6	0.70	0.69	0.80	52.5
11	T1	All MCs	849	5.2	849	5.2	0.541	6.9	LOS A	3.8	27.6	0.70	0.70	0.80	52.6
12	R2	All MCs	59	0.0	59	0.0	0.541	13.6	LOS A	3.8	27.3	0.70	0.71	0.80	51.5
Approach			942	4.8	942	4.8	0.541	7.3	LOS A	3.8	27.6	0.70	0.70	0.80	52.5
All Vehicles			2797	4.0	2797	4.0	0.541	7.9	LOS A	3.8	27.6	0.59	0.65	0.66	52.1

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.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

Roundabout 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.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SCT CONSULTING PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 21 November 2024 9:57:23 PM

Project: S:\Projects\SCT_00669_Anambah MHE\4. Tech Work\1. Modelling\SCT_00669_Anambah MHE_SIDRA_v0.1_sc.sip9

MOVEMENT SUMMARY

Site: 5PM38_F [NEW_ANA_38_PM_O1_Mod_No
Wyndella_Infra test - Import - Copy (Site Folder: Future Year
2038 w 900 Lots + Dev Mod)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New England Highway / Anambah Road / Shipley Drive

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Shipley Drive															
1	L2	All MCs	92	4.6	92	4.6	0.787	77.0	LOS F	15.4	110.7	1.00	0.91	1.11	27.8
2	T1	All MCs	49	4.3	49	4.3	*0.787	72.1	LOS F	15.4	110.7	1.00	0.91	1.11	28.5
3	R2	All MCs	306	1.0	306	1.0	0.787	77.0	LOS F	15.6	110.7	1.00	0.90	1.11	27.9
Approach			447	2.1	447	2.1	0.787	76.5	LOS F	15.6	110.7	1.00	0.90	1.11	26.4
East: New England Highway (E)															
4	L2	All MCs	244	3.0	244	3.0	0.190	22.0	LOS B	2.0	14.3	0.18	0.60	0.18	52.2
5	T1	All MCs	1853	2.1	1853	2.1	*0.933	57.4	LOS E	69.7	496.9	0.99	1.01	1.12	34.9
6	R2	All MCs	394	3.2	394	3.2	0.562	67.5	LOS E	12.3	88.4	0.96	0.82	0.96	29.4
Approach			2490	2.4	2490	2.4	0.933	55.5	LOS D	69.7	496.9	0.91	0.94	1.00	31.3
North: Anambah Road															
7	L2	All MCs	309	2.4	309	2.4	0.451	27.9	LOS B	12.7	91.0	0.73	0.78	0.73	40.3
8	T1	All MCs	55	5.8	55	5.8	*0.606	72.6	LOS F	5.1	37.3	1.00	0.79	1.04	27.3
9	R2	All MCs	88	3.3	88	3.3	0.606	78.4	LOS F	5.1	37.3	1.00	0.79	1.04	26.1
Approach			453	3.0	453	3.0	0.606	43.2	LOS D	12.7	91.0	0.82	0.79	0.83	34.6
West: New England Highway (W)															
10	L2	All MCs	535	3.1	535	3.1	0.710	43.9	LOS D	30.0	215.7	0.89	0.86	0.89	34.6
11	T1	All MCs	1335	4.8	1335	4.8	0.854	54.2	LOS D	43.2	314.7	0.97	0.92	1.02	35.5
12	R2	All MCs	59	0.0	59	0.0	*0.889	114.2	LOS F	4.6	32.2	1.00	0.93	1.46	23.7
Approach			1929	4.2	1929	4.2	0.889	53.2	LOS D	43.2	314.7	0.95	0.91	1.00	31.9
All Vehicles			5319	3.1	5319	3.1	0.933	55.4	LOS D	69.7	496.9	0.92	0.91	1.00	31.3

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.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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 Green.

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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Input Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed	
	ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec	
South: Shipley Drive												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

East: New England Highway (E)												
P2 Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92	
North: Anambah Road												
P3 Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92	
West: New England Highway (W)												
P41 Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92	
P42 Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92	
All Pedestrians	0	263	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SCT CONSULTING PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 21 November 2024 8:26:35 PM

Project: S:\Projects\SCT_00669_Anambah MHE\4. Tech Work\1. Modelling\SCT_00669_Anambah MHE_SIDRA_v0.1_sc.sip9

MOVEMENT SUMMARY

Site: 5PM38_F [NEW_ANA_38_PM_O1_Mod_No
Wyndella_Infra test - Import (Site Folder: Future Year 2038 w 900
Lots Mod)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

New England Highway / Anambah Road / Shipley Drive

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh. veh	Dist] m				km/h
South: Shipley Drive															
1	L2	All MCs	92	4.6	92	4.6	0.787	77.0	LOS F	15.4	110.7	1.00	0.91	1.11	27.8
2	T1	All MCs	49	4.3	49	4.3	*0.787	72.0	LOS F	15.4	110.7	1.00	0.91	1.11	28.5
3	R2	All MCs	306	1.0	306	1.0	0.787	77.0	LOS F	15.6	110.7	1.00	0.90	1.11	27.9
Approach			447	2.1	447	2.1	0.787	76.4	LOS F	15.6	110.7	1.00	0.90	1.11	26.4
East: New England Highway (E)															
4	L2	All MCs	244	3.0	244	3.0	0.190	21.8	LOS B	2.0	14.3	0.18	0.60	0.18	52.2
5	T1	All MCs	1853	2.1	1853	2.1	*0.929	56.1	LOS D	68.9	491.5	0.99	1.00	1.11	35.4
6	R2	All MCs	358	3.2	358	3.2	0.512	66.8	LOS E	11.1	79.6	0.95	0.81	0.95	29.6
Approach			2455	2.4	2455	2.4	0.929	54.2	LOS D	68.9	491.5	0.90	0.93	0.99	31.7
North: Anambah Road															
7	L2	All MCs	305	2.4	305	2.4	0.445	27.8	LOS B	12.5	89.5	0.73	0.78	0.73	40.3
8	T1	All MCs	55	5.8	55	5.8	*0.584	72.4	LOS F	4.9	35.9	1.00	0.78	1.03	27.3
9	R2	All MCs	83	3.3	83	3.3	0.584	78.1	LOS F	4.9	35.9	1.00	0.78	1.03	26.1
Approach			443	3.0	443	3.0	0.584	42.8	LOS D	12.5	89.5	0.81	0.78	0.82	34.7
West: New England Highway (W)															
10	L2	All MCs	499	3.1	499	3.1	0.663	42.7	LOS D	27.3	195.9	0.87	0.85	0.87	35.0
11	T1	All MCs	1335	4.8	1335	4.8	0.853	54.1	LOS D	43.1	314.3	0.97	0.92	1.02	35.5
12	R2	All MCs	59	0.0	59	0.0	*0.889	114.1	LOS F	4.6	32.2	1.00	0.93	1.46	23.7
Approach			1893	4.2	1893	4.2	0.889	52.9	LOS D	43.1	314.3	0.94	0.90	0.99	32.0
All Vehicles			5239	3.1	5239	3.1	0.929	54.7	LOS D	68.9	491.5	0.92	0.91	0.99	31.5

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.

Intersection and Approach LOS values are based on average delay for all vehicle movements.

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 Green.

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.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance												
Mov ID	Input Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Eff. Stop Rate	Travel Time	Travel Dist.	Aver. Speed	
	ped/h	ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec	
South: Shipley Drive												
P1	Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92

East: New England Highway (E)												
P2 Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92	
North: Anambah Road												
P3 Full	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92	
West: New England Highway (W)												
P41 Stage 1	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92	
P42 Stage 2	50	53	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92	
All Pedestrians	0	263	64.3	LOS F	0.2	0.2	0.96	0.96	218.1	200.0	0.92	

Level of Service (LOS) Method: SIDRA Pedestrian LOS Method (Based on Average Delay)

Pedestrian movement LOS values are based on average delay per pedestrian movement.

Intersection LOS value for Pedestrians is based on average delay for all pedestrian movements.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SCT CONSULTING PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 21 November 2024 8:24:41 PM

Project: S:\Projects\SCT_00669_Anambah MHE\4. Tech Work\1. Modelling\SCT_00669_Anambah MHE_SIDRA_v0.1_sc.sip9

MOVEMENT SUMMARY

Site: 4AM_X [ANA_ACC_PM_X (Site Folder: Access)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Anambah Road / Access Road

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.	Dist]				km/h
			veh/h		veh/h					veh	m				
South: Anambah Road (S)															
10	L2	All MCs	665	1.0	665	1.0	0.377	5.7	LOS A	0.0	0.0	0.00	0.55	0.00	52.9
11	T1	All MCs	32	1.0	32	1.0	0.377	0.1	LOS A	0.0	0.0	0.00	0.55	0.00	55.0
Approach			697	1.0	697	1.0	0.377	5.4	NA	0.0	0.0	0.00	0.55	0.00	53.0
North: Anambah Road (N)															
5	T1	All MCs	32	1.0	32	1.0	0.021	0.6	LOS A	0.1	0.4	0.20	0.23	0.20	58.4
6	R2	All MCs	5	1.0	5	1.0	0.021	7.8	LOS A	0.1	0.4	0.20	0.23	0.20	51.6
Approach			37	1.0	37	1.0	0.021	1.6	NA	0.1	0.4	0.20	0.23	0.20	57.3
West: Access Road															
7	L2	All MCs	5	1.0	5	1.0	0.060	4.6	LOS A	0.1	1.0	0.20	0.56	0.20	48.7
9	R2	All MCs	74	1.0	74	1.0	0.060	5.2	LOS A	0.1	1.0	0.20	0.56	0.20	48.4
Approach			79	1.0	79	1.0	0.060	5.1	LOS A	0.1	1.0	0.20	0.56	0.20	48.5
All Vehicles			813	1.0	813	1.0	0.377	5.2	NA	0.1	1.0	0.03	0.54	0.03	52.7

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.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SCT CONSULTING PTY LTD | Licence: NETWORK / 1PC | Processed: Friday, 23 August 2024 4:08:38 PM

Project: S:\Projects\SCT_00669_Anambah MHE\4. Tech Work\1. Modelling\SCT_00669_Anambah MHE_SIDRA_v0.1_sc.sip9

MOVEMENT SUMMARY

Site: 4AM_X [ANA_ACC_PM_X (Site Folder: Access wDev)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Anambah Road / Access Road

Site Category: (None)

Give-Way (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%	v/c	sec		[Veh.]	[Dist]				km/h
			veh/h		veh/h					veh	m				
South: Anambah Road (S)															
10	L2	All MCs	742	0.9	742	0.9	0.418	5.7	LOS A	0.0	0.0	0.00	0.55	0.00	52.8
11	T1	All MCs	32	1.0	32	1.0	0.418	0.2	LOS A	0.0	0.0	0.00	0.55	0.00	54.9
Approach			773	0.9	773	0.9	0.418	5.5	NA	0.0	0.0	0.00	0.55	0.00	52.9
North: Anambah Road (N)															
5	T1	All MCs	32	1.0	32	1.0	0.021	0.7	LOS A	0.1	0.4	0.21	0.24	0.21	58.2
6	R2	All MCs	5	1.0	5	1.0	0.021	8.3	LOS A	0.1	0.4	0.21	0.24	0.21	51.5
Approach			37	1.0	37	1.0	0.021	1.8	NA	0.1	0.4	0.21	0.24	0.21	57.2
West: Access Road															
7	L2	All MCs	5	1.0	5	1.0	0.068	4.6	LOS A	0.2	1.2	0.21	0.56	0.21	48.6
9	R2	All MCs	82	0.9	82	0.9	0.068	5.3	LOS A	0.2	1.2	0.21	0.56	0.21	48.4
Approach			87	0.9	87	0.9	0.068	5.2	LOS A	0.2	1.2	0.21	0.56	0.21	48.4
All Vehicles			897	0.9	897	0.9	0.418	5.3	NA	0.2	1.2	0.03	0.54	0.03	52.6

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.

SIDRA INTERSECTION 9.1 | Copyright © 2000-2024 Akcelik and Associates Pty Ltd | sidrasolutions.com

Organisation: SCT CONSULTING PTY LTD | Licence: NETWORK / 1PC | Processed: Friday, 1 November 2024 10:55:19 AM

Project: S:\Projects\SCT_00669_Anambah MHE\4. Tech Work\1. Modelling\SCT_00669_Anambah MHE_SIDRA_v0.1_sc.sip9



Thoughtful Transport Solutions

Suite 4.03, Level 4, 157 Walker Street, North Sydney NSW 2060
sctconsulting.com.au