TRAFFIC IMPACT ASSESSMENT

LOCHINVAR LIFESTYLE RESORT
MANUFACTURED HOME ESTATE

LOT 225 DP1003242
34 WYNDELLA ROAD

PREPARED FOR: COMMERCIAL 7 PTY LTD

JANUARY 2024

REF:23/102

TRAFFIC IMPACT ASSESSMENT
LOCHINVAR LIFESTYLE RESORT – MANUFACTURED HOME ESTATE
COMMERCIAL 7 PTY LTD

LOT 225 DP1003242
34 WYNDELLA ROAD, LOCHINVAR

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Issue	Date	Description	By
A	17/10/23	Draft	JG
B	20/10/23	Edit	JG
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D	12/01/24	Approved	JG

This document has been authorised by

Date 12th January 2023

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1. INTRODUCTION

Intersect Traffic Pty Ltd (Intersect Traffic) was engaged by Commercial 7 Pty Ltd to prepare a traffic impact assessment (TIA) report for a proposed Lifestyle Resort - manufactured home estate for over 50's on Lot 225 DP1003242 34 Wyndella Road, Lochinvar. The proposal will provide up to 209 dwellings with associated community and recreational facilities including bowling green, swimming pool, tennis court and leisure club. development as per the concept site plan provided within ***Appendix 1***. The report is required to support a development application to Maitland City Council for the development.

The aim of this assessment is to determine the likely impact of the development on the adjacent local road network due to the traffic generated by the development. This report presents the findings of the traffic impact assessment and includes the following:

1. An outline of the existing road network in the vicinity of the proposed development.
2. An assessment of the likely peak traffic generation from the development.
3. An assessment of the likely traffic impacts of the proposal on the adjacent road network in particular in terms of the capacity of the existing road network linking to the sub-arterial road network.
4. An assessment of the proposed development access and on-site parking.
5. Presentation of conclusions and any recommendations.

This assessment has been carried out with reference to the *RTA's Guide to Traffic Generating Developments*, Austroads *Guide to Road Design Guidelines* (2019), Austroads *Guide to Traffic Management Guidelines (2020)*. Maitland City Council's DCP and the NSW Local Government Manufactured Home Village / Caravan Park Regulations as well as utilising information provided by AEP Developments.

2. SITE DESCRIPTION

The subject site is located on the eastern side of Wyndella Road, Lochinvar approximately 340 metres north of the New England Highway. The site only has frontage to Wyndella Road. The site is approximately 1.5 km's north-east of the shops in Lochinvar and 5.5 km's north-west of Rutherford Shopping Centre. The development site is currently rural land containing one dwelling and associated structures. The subject site is shown in ***Figure 1*** in context with the surrounding properties, and roads.

Figure 1 – Site Location Plan

The site has the following property descriptors:

- Formal title of Lot 225 in DP 1003242.
- Address of 34 Wyndella Road, Lochinvar.
- Area of approximately 10.7 ha, and
- Zoning of RU2 – Rural Landscape pursuant to the Maitland LEP (2011).

The site is adjacent to but not within the northern section of the Lochinvar Urban Release Area and is currently served by an existing rural vehicular access off Wyndella Road. ***Photographs 1 & 2*** below show the site's vehicular access off Wyndella Road and the site from this access.

Photograph 1 – Existing site access – Wyndella Road.

Photograph 2 – Site from Wyndella Road near site vehicular access.

3. EXISTING ROAD NETWORK

3.1 New England Highway (A43)

The New England Highway is part of the classified State Highway network and is a major sub-arterial road in the region. It is currently under the care and control of Transport for NSW (TfNSW). With the opening of the Hunter Expressway, it now performs the function of a sub-arterial road connecting Maitland to the rural areas of Lochinvar, Greta, and Branxton. Through Lochinvar the New England Highway is generally a two-lane two-way sealed urban road constructed to highway standards however an overtaking lane for eastbound traffic is provided between Robert Street and east of Wyndella Road. Lane widths are in the vicinity of 3.4 to 3.8 metres and an 80 km/h speed limit applies to the section of the Highway near Wyndella Road. At the time of inspection, the New England Highway was observed to be in good condition (***Photograph 3***).

3.2 Wyndella Road

Wyndella Road near the site is a local rural access road under the care and control of Maitland City Council with its primary function providing access to properties on its length. From the New England Highway to the entrance to the site it is a narrow sealed rural road approximately 3.5 metres wide with unsealed shoulders / verges providing up to 5.5 metres of clearance for vehicles. Past the entrance to the site including along the site road frontage Wyndella Road is an unsealed gravel road. Two-way traffic flow at low speeds is possible on the road but is only suitable for low traffic volumes as is currently the case with existing development on the road. A 50 km/h speed limit would apply to this section of road and at the time of inspection Wyndella Road was observed to be only in fair condition. (See ***Photographs 4 & 5***). In the future with the development of the Lochinvar URA Wyndella Road will become a local collector road and will be upgraded and widened as development occurs.

Photograph 3 – New England Highway near Wyndella Road intersection.

Photograph 4 – Wyndella Road south of site access.

Photograph 5 – Wyndella Road north of site access.

4. ROAD NETWORK IMPROVEMENTS

Future upgrades to the road network will occur as the Lochinvar URA develops. The works that will impact on the development will be the upgrading of Wyndella Road to an urban primary distributor road from the New England Highway with a 15-metre-wide carriageway and upright kerb and gutter on both sides of the road. With major residential developments proposed opposite the site and on Anambah Road with a connection to Wyndella Road it is expected the upgrading of Wyndella Road to the site is likely to occur within a 5-year timeframe.

5. TRAFFIC VOLUMES

Current peak hour traffic volumes on the road network sourced from the Traffic Impact Assessment Report prepared by STC Consulting (3 May 2023) for a proposed major residential subdivision opposite the site (898 New England Highway Rutherford) are as shown in ***Table 1*** below. Future traffic volumes have been sourced from the Lochinvar Urban Release Area Traffic and Transport Report by URaP-TTW v10 (September 2012) and represent figures for full development of the URA (approximately 2040). The relevant figures and tables referenced are provided in ***Appendix 2***. Note: - For Wyndella Road the future peak hour traffic volume on Wyndella Road was assumed to be 15% of the daily traffic figure sourced from Figure 5.3b of the URAP-TTW Report (September 2012).

Table 1 – Existing and Future Road Network Peak Hour Traffic Volumes.

Road	Section	2023		Full Development URA	
		AM (vtph)	PM (vtph)	AM (vtph)	PM (vtph)
New England Highway	West of Wyndella Road	1474	1544	3155	2400
New England Highway	East of Wyndella Road	1560	1574	3155	2400
Springfield Drive	South of New England Highway	204	182	425	763
Wyndella Road	North of New England Highway	4	4	150	150

These existing and future traffic volumes have been adopted in this assessment.

6. ROAD CAPACITIES

The capacity of the road network is generally determined by the capacity of intersections. However, for urban roads Table 4.3 of the RTA's Guide to Traffic Generating Developments, reproduced below, provides some guidance on mid-block capacities for a level of service (LoS) C.

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

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

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

Noting all roads on the local and state road network being two-lane two-way undivided roads they would have a one-way mid-block capacity of at least 900 vtph and a two-way mid-block capacity of 1,800 vtph for a LoS C. However, as the New England Highway is a major sub-arterial road it would still be acceptable for the road to operate with a LoS D with single lane capacities at least up to 1,300 vtph for an 80 km/h speed zone. (*reference Austroads Guide to Traffic Management Part 3 – Traffic Studies and Analysis – Figure 3.1*). Therefore, the two-way mid-block road capacities adopted in this assessment are;

- New England Highway – 2,600 vtph;
- Wyndella Road – 1,800 vtph.

As the current and post full development of the Lochinvar URA peak traffic volumes on the New England Highway and Wyndella Road determined in ***Section 5*** above are less than the technical two-way mid-block capacities determined above it is concluded the local and state road network has spare capacity to cater for additional traffic generated by the proposed development subject to satisfactory intersection performance.

7. ALTERNATE TRANSPORT MODES

Hunter Valley Buses run public transport (bus) services in the area. Routes 179, 180, 401, 402 and 403 (Singleton to Maitland) run along the New England Highway through Lochinvar (see ***Figure 2*** below). The nearest bus stops are located within convenient walking distance of the site (400 metres) on the New England Highway, immediately west of Wyndella Road as shown in ***Photograph 6*** below. This provides a frequent and regular public transport service to the site servicing major retail, commercial and health services in Singleton, Rutherford, Maitland, and Greenhills as well as connection to the heavy rail services at Maitland Railway Station. From public transport connections (bus and rail) are available to all facilities in the Newcastle, Central Coast and Sydney areas.

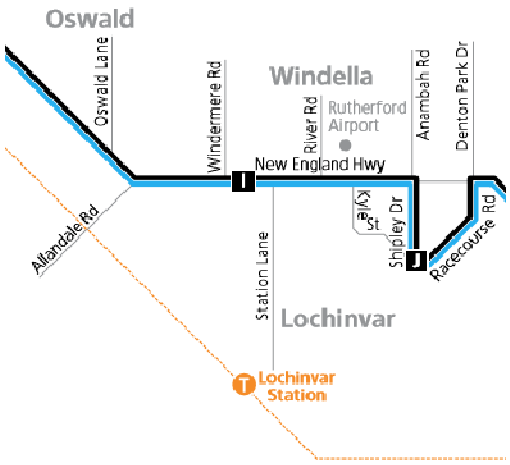


Figure 2 – Bus route map.

Constructed pedestrian footpaths exist along the New England Highway from the Wyndella Road traffic signals to the bus stops while safe pedestrian crossing phases are included within the New England Highway / Wyndella Road / Springfield Drive traffic signals (see ***Photograph 7***). On-road cycle lanes are provided the New England Highway and Springfield Drive. There are also pedestrian pathways and on-road cycle lanes on the New England Highway and Springfield Drive with the Springfield Drive facilities eventually connecting to a future local shopping village proposed for the area around the Springfield Drive / Robert Road intersection. Future upgrading of Wyndella Road with the URA development will also include the provision of pedestrian pathways and cycle lanes within the Wyndella Road construction from the site to the New England Highway.

Photograph 6 – Bus Stops / Pathway New England Highway near Wyndella Road.

Photograph 7 – Pedestrian Crossing New England Highway / Wyndella Road signals.

8. PROPOSED DEVELOPMENT

The proposal involves the construction of manufactured home village / Lifestyle Resort to be known as Lochinvar Lifestyle Resort targeting the over 55's market for retired or semi-retired persons. The proposed site master plan is shown in ***Appendix 1***. Specifically, the development will include the provision of:

- 209 manufactured home sites.
- Community Centre / Office / Activities building.
- A small resident only bowling green.
- A resident only swimming pool.
- Two residents only pickle ball courts.
- On-site resident parking within each site plus 47 visitor car sparks spread out throughout the site in six (6) separate parking areas with 4 accessible parking spaces.
- A caravan parking / storage area.
- Main vehicular access off Wyndella Road relocated approximately 80 metres north of the existing site access which will be maintained as a bushfire access road,
- Secondary emergency only access to Pennparc Drive,
- Internal roadways a minimum 10 metres wide for site circulation; and
- Drainage and landscaping to Maitland City Council requirements.

Development works will include half road construction of Wyndella Road to a primary distributor standard as per the Lochinvar URA structure plan as well as temporary road widening works on Wyndella Road from the southern boundary of the site to the New England Highway if required by Maitland City Council.

9. TRAFFIC GENERATION

In considering the traffic generating potential of the development reference is made to the recommended traffic generation rates within the TfNSW documents *RTA's Guide to Traffic Generating Developments (2002)* and *Technical Direction TDT 2013/4* which released updated traffic generation rates in 2013.

As a lifestyle village targeting the over 50's living market traffic generation for the long-term sites will be similar to seniors housing and the relevant recommended traffic generation rate for assessment is the most recent available data found in TDT 2013/04 which provides the following rates for Seniors Housing.

Weekday daily vehicle trips = 2.1 per dwelling; and
Weekday peak hour vehicle trips = 0.4 per dwelling.

It is noted that the TDT also states that the morning peak does not generally coincide with the road network peak however to ensure a robust assessment of this proposal it is assumed the morning peak does coincide with the road network peak. Based on the above rates and the proposed development the likely traffic generation for the proposed development is calculated as follows.

- Weekday daily vehicle trips = 209 x 2.1 = **439 vehicle trips per day (vtpd)**; and
- Weekday peak hour vehicle trips = 209 x 0.4 = **84 vehicle trips per hour (vtph)**.

These values have been adopted in this assessment.

This traffic is distributed through the road network using the following assumptions based on the type of development, likely origin / destinations, and existing traffic distributions. It is considered

the majority of trips will be to and from Rutherford or Maitland which provides all the business, retail, health, and education services in the region while the origin / destinations to the west will include Singleton, Branxton, and connection to the Hunter Expressway. With a local shopping village being constructed on Springfield Drive south of the site there will also be origin / destinations south to Springfield Drive.

- All traffic utilising the site will use the New England Highway and Wyndella Road to access the site.
- In the AM peak 70 % of traffic will be outbound while in the PM peak 70 % of traffic will be inbound.
- 60% of traffic will have an origin / destination east towards Rutherford and Maitland, 25 % will have an origin / destination south towards Springfield Road and 15 % will have an origin destination west towards Branxton and Singleton.

The resulting trip distribution at the New England Highway / Wyndella Road / Springfield Drive traffic signals is therefore as shown graphically below in ***Figure 3.***

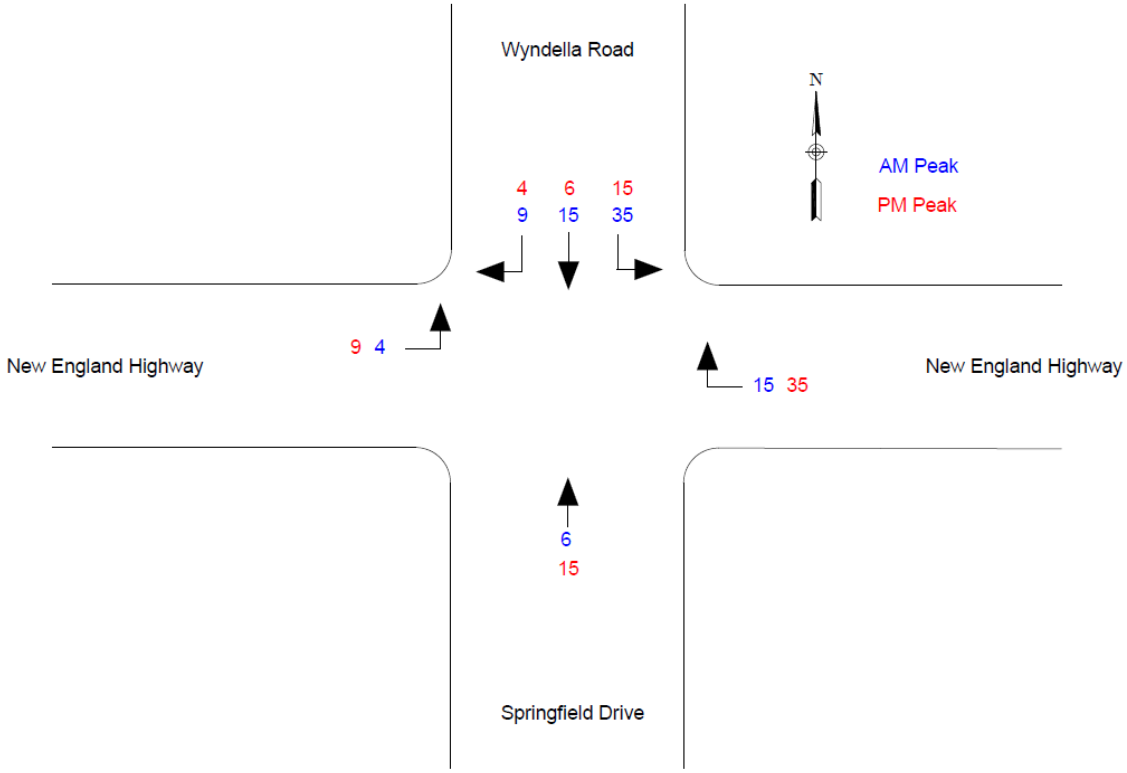


Figure 3 – Development Traffic Trip Distribution

10. TRAFFIC IMPACT ASSESSMENT

10.1 Road Network Capacity

This assessment has determined (***Section 6***) that the existing road network around the site is currently operating below its technical mid-block two-way capacity and has spare capacity to cater for additional traffic from the proposed development as well as the full development of the Lochinvar URA. ***Section 9*** of this report determined that the subject development is likely to generate 84 additional vehicle trips per hour during the road network peaks (AM & PM). The resulting additional traffic distributed as shown in ***Figure 3*** is not sufficient for the local and state road network to reach their respective two-way mid-block capacities as shown in ***Table 2*** below.

Table 2 – Two-way mid-block road capacity check

Road	Section	2023 + development		Full Development URA		Road	Development Traffic	
		AM (vtph)	PM (vtph)	AM (vtph)	PM (vtph)	Capacity	AM	PM
New England Highway	West of Wyndella Road	1487	1557	3168	2413	4400	13	13
New England Highway	East of Wyndella Road	1610	1624	3205	2450	4400	50	50
Springfield Drive	South of New England Highway	225	203	446	784	1330	21	21
Wyndella Road	North of New England Highway	88	88	234	234	1330	84	84

Therefore, it is reasonable to conclude the development will not adversely impact on the mid-block levels of service experienced on the state and local road network.

10.2 Intersection Capacity

The intersection most likely to be impacted by this development is the New England Highway / Wyndella Road / Springfield Drive traffic signals.

The impact of this development on the operation of this intersection can be determined by using the SIDRA intersection modelling software. The SIDRA INTERSECTION software package predicts likely delays, queue lengths and thus levels of service that will occur at intersections. Assessment is then based on the level of service requirements of TfNSW shown below.

Table 4.2
Level of service criteria for intersections

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Signs
A	< 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays & spare capacity	Acceptable delays & spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Operating near capacity	Near capacity & accident study required
E	57 to 70	At capacity; at signals, incidents will cause excessive delays Roundabouts require other control mode	At capacity, requires other control mode

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

This software package predicts likely delays, queue lengths and thus levels of service that will occur at intersections. The assumptions made in the modelling were:

- Post development AM and PM peak hours were modelled for 2023 and on full development of the Lochinvar URA likely to be around 2040,
- Current and future traffic volumes are as provided within ***Appendix 2***,
- Development traffic was distributed onto the road network as per ***Figure 3***,
- The directional split of traffic for the full development of the Lochinvar URA was based on the existing directional split of New England Highway traffic and the trip distributions assumed in ***Section 9***; and
- The intersection was modelled as per its current configuration.

Summaries of the results of the relevant AM and PM modelling for the 'all vehicles' case movement for the intersection are shown below in ***Table 3*** while the Sidra Movement Summary Tables for the models are provided in ***Appendix 3***.

Table 3 – New England Hwy / Wyndella Rd / Springfield Dr – Sidra results summary

Modelled Peak	Cycle Time (s)	Degree of Saturation (v/c)	Average Delay (s)	Level of Service	95% back of queue length (cars)
2023 AM	140	0.468	24.6	B	19.4
2023 AM + development	140	0.469	26.3	B	19.4
Full development URA AM	140	0.825	39.3	C	47.8
Full development URA AM + development	140	0.827	40.4	C	48.2
2023 PM	135	0.482	24.3	B	19.8
2023 PM + development	135	0.482	26.2	B	19.8
Full Development URA PM	115	0.862	41.0	C	35.8
Full development URA PM + development	115	0.867	42.0	C	36.4

This modelling shows that the New England Highway / Wyndella Road / Springfield Drive traffic signals will continue to operate satisfactorily with the additional traffic generated by the subject development through to and beyond full development of the Lochinvar URA. The average delay, levels of service and queue lengths at the intersection remain within the thresholds determined by TfNSW's as representing satisfactory operation for a signalised intersection. The impact of the development is that average delays are increased by less than 2 seconds and 95 % back of queue lengths by less than 1 vehicle. Importantly there is no loss in overall LoS of the intersection resulting from the development.

It is therefore concluded the proposed development will not adversely impact on the operation of intersections on the local and state road network.

10.3 On-Site Car Parking

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

Resident Parking

1 resident parking space per dwelling and camping site

Visitor Parking

1 visitor parking space for each 10 (and any remaining fraction of 10) long-term sites and 1 visitor car parking space for each 20 (and any remaining fraction of 20) short term sites.

Accessible Parking

1 visitor accessible parking space per 100 sites or fraction of 100 sites (long-term & short-term).

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

Noting that on completion of the development a total of 209 long term sites would exist on the site, the following on-site parking is required to be provided:

- Resident Parking – 209 car parks
- Visitor Car Parking – 209 / 10 = 21 car parks
- Accessible Visitor Car Parking 209 / 100 = 2 car parks (within the 21 visitor car parks to be provided)

On examination of the plans, it was found that:

- As each site has an area in excess of 200 m^2 it is considered there is sufficient room on each site to provide an on-site resident car park,
- 47 visitor car parking spaces are shown with 4 accessible spaces, and
- The applicant has advised that the car parking spaces are all 6.1m long x 2.5m wide.

It is therefore concluded that the proposal would meet the requirements of the Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005 therefore sufficient and suitable on-site car parking is provided within the development.

10.4 Access

The proposed development involves the construction of a new access to Wyndella Road. This access and access to the individual sites would be required to meet the requirements of the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005,* Australian Standard *AS2890.1-2004 Parking facilities Part 1: Off-street car parking* and in the case of Wyndella Road main access the requirements of *Maitland City Council.*

In regard to the regulation the important requirements and an assessment of compliance are:

- A dwelling site must have access to an access road – Proposal is compliant.
- In the case of a divided entrance and exit road the width of the sealed road on either side of the median must be at least 5 metres. – The proposal shows a divided entry road with at least 5 metres of road pavement either side of the median – Proposal is compliant.
- A forecourt 4 metres x 20 metres needs to be provided for incoming vehicles – The visitor car parking bays at the front of the development would combined represent compliance with this requirement.
- The width of an access road (internal) must be 6 metres for two-way flow or 4 metres for one way flow and one way flow needs to be indicated by a conspicuous sign. The proposal will comply as all roads have been designed to be a minimum 6 metres wide with verges which also allows easy access through the site for most rigid heavy vehicles including waste collection vehicles operated by a private contractor.

Overall, it is concluded the access roads within the development are suitable for two-way flow of vehicles and the entry access to the development is compliant with the Regulation requirements therefore is suitable for the development.

Sight distance along Wyndella Road at the proposed access has been observed to be in excess of the 83 metres required to be compliant with Figure 3.2 of Australian Standard *AS 2890.1-2004 Parking facilities Part 1: Off street car parking* for a 60 km/h speed environment which is realistically the speed environment in Wyndella Road. Sight distances of over 300 metres were observed on site. Therefore, the proposed site access is suitably safe to service the development.

With little through traffic on Wyndella Road currently, initially the access to the development need only be a BAR treatment at the access which can be achieved with the road upgrading requirements discussed below in ***Section 10.5***. With the development of the URA opposite the site Wyndella Road will become a 15-metre-wide urban road and again this would allow the objectives of a BAR treatment i.e., safe passing area for through traffic to be achieved.

Overall, it is considered that with the likely Maitland City Council requirements for the upgrading of Wyndella Road a suitably safe vehicular access to and within the development compliant with *Maitland City Council*, *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005* and Australian Standard *AS2890.1-2004 Parking facilities Part 1: Off-street car parking* will be provided.

10.5 Road Upgrading Requirements.

It would be expected that Maitland Council would require the development to undertake at least half road construction of Wyndella Road along the site frontage to the standard required by the Lochinvar URA structure plan. This would result in a 7.5-metre-wide sealed urban road with kerb and gutter. This is considered suitable for two-way traffic flow until the western side of Wyndella Road is developed and the road widened to a 15-metre sealed urban road with kerb and gutter.

The section of Wyndella Road from the site to the New England Highway is currently a narrow-sealed road only 3.5 metres wide. With the additional traffic from this development, it is considered the minimum standard required for this road for two-way traffic flow is a 6-metre sealed road, until such time development of the adjoining properties occur and this section of Wyndella Road is constructed to the requirements of the Lochinvar Structure Plan. Therefore, it is recommended that the section of Wyndella Road between the site and the New England Highway be widened to 6 metres with a temporary standard pavement until such time it is reconstructed with development of the land to the west of the road wherein at least a 7.5 metre sealed road (half road construction) is provided.

10.6 Alternate Transport Modes

The development site is currently suitably serviced by public transport services along the New England Highway. As the development is not covered by SEPP Housing there is no requirement for a private shuttle bus service for this development however, the operator will provide a resort bus for residents' use. The operator will also provide a driver for two daily return trips to the shopping centre until such time that a safe pedestrian access is provided down to the bus stops on the New England Highway. The shuttle bus arrangements are detailed in the Plan of Management that has been submitted with the application.

Similarly, the development is not expected to generate any significant additional demand for bicycle or pedestrian infrastructure therefore it is unreasonable to require the development to provide such infrastructure until such time as the infrastructure is provided with the development of the Lochinvar URA. Traffic volumes on Wyndella Road will remain low and use of the road pavement by the minimal pedestrians / cyclists would still be a relatively safe practice.

11. CONCLUSIONS

This traffic impact assessment for the for a proposed Lifestyle Resort and manufactured home estate for over 50's with up to 209 dwellings on Lot 225 DP1003242 34 Wyndella Road, Lochinvar has determined the following:

- The proposed development is predicted to generate approximately an additional 439 vtpd or 84 vtph in the AM and PM peak hour periods on the local and state road network.
- The additional traffic generated by the development will not cause the adjacent state and local road network to reach their relevant two-way mid-block capacities even through to the full development of the Lochinvar URA therefore subject to satisfactory intersection operation the local and state road network has sufficient spare capacity to cater for the development.
- Sidra Intersection modelling has shown that the additional traffic from the development will not adversely impact on the operation / capacity of the New England Highway / Wyndella Road / Springfield Drive traffic signals post development in 2023 and through to and beyond the full development of the Lochinvar URA (approximately 2040). Therefore, the development will not adversely impact on the operation of local and state road network intersections near the site.
- The proposed development can provide sufficient on-site parking provision to meet the likely peak parking demand generated by the development and satisfy the requirements of the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005.*
- A suitably safe vehicular access to the development compliant with *Maitland City Council*, *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005* and Australian Standard *AS2890.1-2004 Parking facilities Part 1: Off-street car parking* will be provided.
- The proposed development can be easily serviced for waste collection on-site by a private contractor using the internal road system which being a minimum 10 metres wide allows two-way traffic flow for most rigid heavy vehicles.
- The proposed access to the site is compliant with the requirements of the *Local Government (Manufactured Home Estates, Caravan Parks, Camping Grounds and Moveable Dwellings) regulation 2005* and the proposed internal access roads would also comply with the regulation for two-way traffic flow on the internal access roads.
- Suitable sight distance in accordance with Australian Standard AS 2890.1-2004 *Parking facilities Part 1: Off street car parking* is available at the proposed site access.
- As it is expected Maitland City Council would at least require Wyndella Road along the site frontage to be constructed (half road construction) to the requirements of the Lochinvar URA structure plan, this section of Wyndella Road will be upgraded to a suitable standard for two-way traffic flow post development as it will be a minimum of 7.5 metres of sealed urban road.
- It is also recommended that Wyndella Road between the site and the New England Highway be widened to a 6-metre-wide sealed road on a temporary pavement until such time as the land on the western side of Wyndella Road, being part of the Lochinvar URA, is developed.
- The development is unlikely to generate any significant demand for public transport services therefore no nexus would exist for any change to the existing public transport services in the area as the existing service is deemed suitable for future residents of the development.
- The development is not expected to generate any additional demand for bicycle or pedestrian infrastructure therefore it is unreasonable to require the development to provide such infrastructure until such time as the infrastructure is provided with the development of the Lochinvar URA structure plan. Traffic volumes on Wyndella Road will remain low and use of the road pavement by the minimal pedestrians / cyclists would still be a relatively safe practice.

12. RECOMMENDATION

Having undertaken this traffic impact assessment for a proposed Lifestyle Resort - manufactured home estate for over 50's on Lot 225 DP1003242 34 Wyndella Road, Lochinvar it is recommended that the proposal can be supported from a traffic impact perspective, subject to suitable conditions of consent for upgrading of Wyndella Road as described in this report, as the development will not have an adverse impact on the local and state road network. It will therefore comply with all the requirements of Maitland City Council, Australian Standards, TfNSW and the NSW Government Regulations for Manufactured Home Estates.

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

APPENDIX 1
DEVELOPMENT MASTERPLAN

LEGEND

	Site Area	10.75ha
	Bushfire Buffer (10m - 13m)	1.75ha
	Home Sites	6.24ha
	Private Roads	1.11ha
	Communal Landscape Areas	2.71ha
	Caravan Parking	17 Bays
	Visitor Parking	47 Bays
	Storm water	0.43 ha
HYD	HYDRANT	

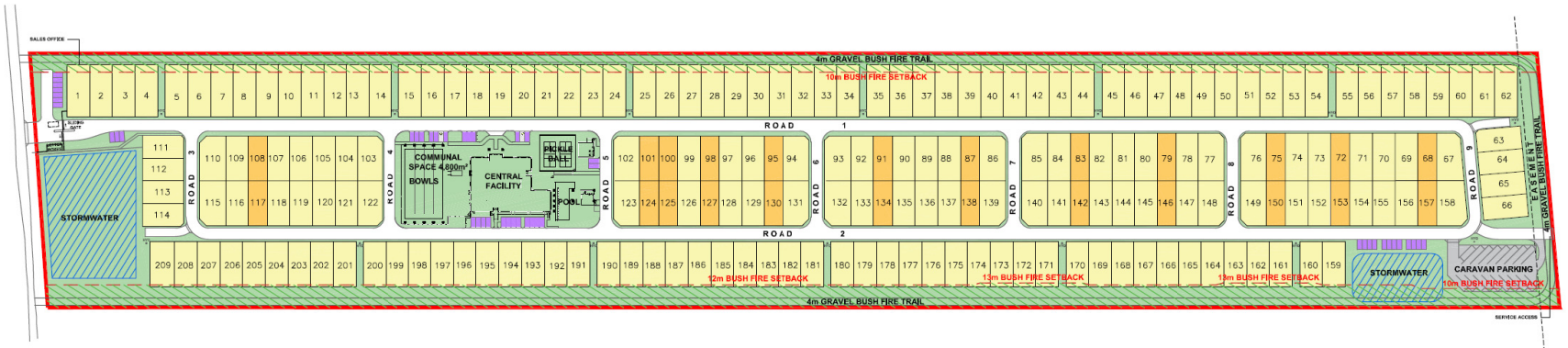
DEVELOPMENT SUMMARY

Home Type		
10 x 23.75/27.75m	24	11%
12 x 23.75/27.75m	185	89%
TOTAL	**209**	

Note:

Corner lots are 1m wider to accommodate an additional side setback.

Communal Landscape Area = Area shown in green minus stormwater and approximate driveway area for each lot.



CLIENT
COMMERCIAL 7 PTY LTD

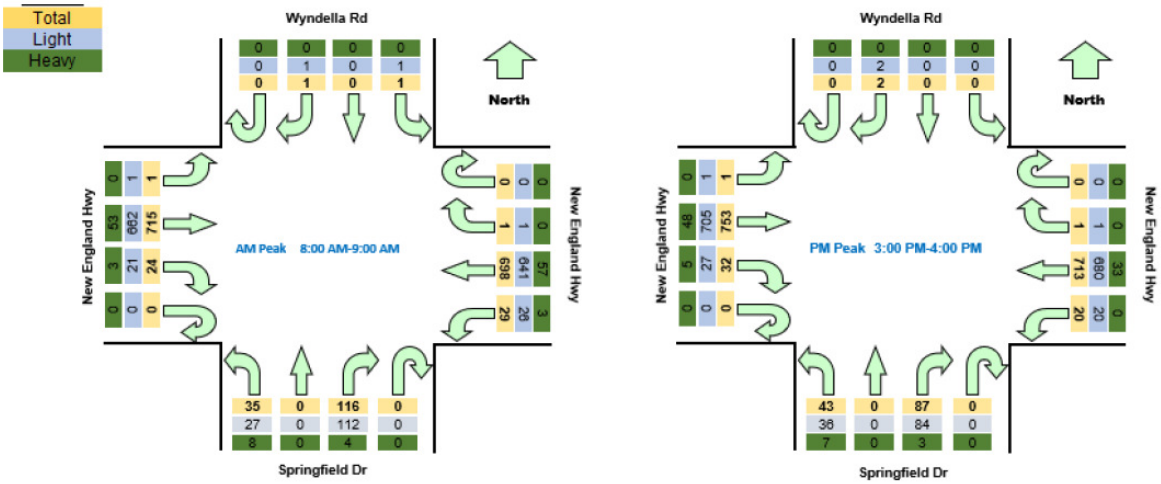
PROJECT NAME
34 WYNDELLA ROAD, LOCHINVAR
DRAWING
MASTERPLAN

PROJECT NO.	DRAWING NO.	SCALE	ISSUE	DATE
S45000	SK.01	1: 2000 @ A3	L	19/12/2023

50 Peerless Avenue
Merrimac Beach QLD 4218
Phone: 07 5555 2600
Email: hrts@bdasearch.com.au
ABN 77 081 702 301

bda architecture

APPENDIX 2
TRAFFIC VOLUME DATA



Source: Trans Traffic Survey, 2023

Table 5.4 Projected Future Hourly Traffic Volumes – Lochinvar Area

Road	Hourly Traffic Volumes-AM	Hourly Traffic Volumes-PM	LoS
NE Highway Eastbound – W of Wyndella Rd	2,010	713	
NE Highway Westbound – W of Wyndella Rd	1,145	1,687	
Total (ID No 1)	**3,155**	**2,400**	**D**
Southern Ring Rd East end (S of NEH) northbound	231	45	
Southern Ring Rd East end (S of NEH) southbound	194	718	
Total (ID No 5)	**425**	**758**	**C**
Southern Ring Rd West end (S of NEH) eastbound	66	592	
Southern Ring Rd West end (S of NEH) westbound	1,051	59	
Total (ID No 6)	**1,117**	**651**	**D/E**
Station Lane (N of Ring Rd) northbound	101	231	
Station Lane (N of Ring Rd) southbound	400	18	
Total (ID No 13)	**501**	**249**	**C**
Southern Ring Rd East of Station Lane eastbound	351	125	
Southern Ring Rd East of Station Lane westbound	417	325	
Total (ID No 9)	**768**	**450**	**C/D**
Southern Ring Rd West of Station Lane eastbound	220	281	
Southern Ring Rd West of Station Lane westbound	669	113	
Total (ID No 10)	**889**	**394**	**C/D**
Old North Road East of Station Lane eastbound	281	16	
Old North Road East of Station Lane westbound	20	289	
Total (ID No 14)	**301**	**305**	**B**

Source : - Lochinvar URA Traffic and Transport Report – UraP-TTW (September 2012).

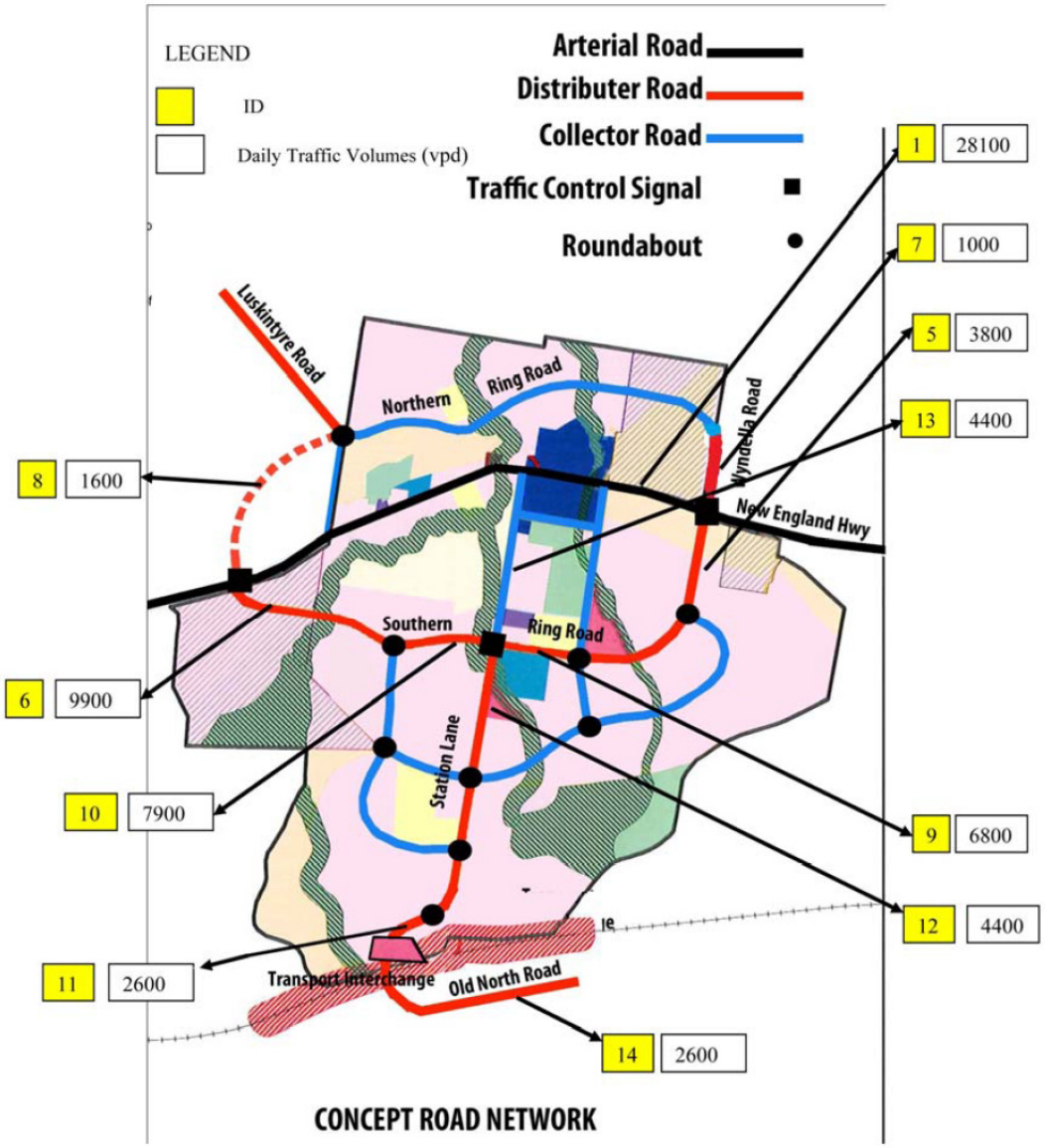


Figure 5.3b Future Traffic Volumes

Source : - Lochinvar URA Traffic and Transport Report – UraP-TTW (September 2012).

APPENDIX 3
SIDRA SUMMARY TABLES

MOVEMENT SUMMARY

Site: 101 [2023AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

New England Hwy / Wyndella Road / Sprinfield Drive signals
2021 counts increased by 4 %
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Sprinfield Drive															
1	L2	All MCs	38	22.2	38	22.2	0.195	44.1	LOS D	1.8	14.8	0.93	0.72	0.93	32.7
2	T1	All MCs	1	0.0	1	0.0	*0.447	69.1	LOS E	4.3	31.2	1.00	0.76	1.00	25.0
3	R2	All MCs	126	3.3	126	3.3	0.447	73.6	LOS F	4.3	31.2	1.00	0.76	1.00	26.6
Approach			165	7.6	165	7.6	0.447	66.8	LOS E	4.3	31.2	0.98	0.75	0.98	27.8
East: New England Highway															
4	L2	All MCs	32	10.0	32	10.0	0.033	22.4	LOS B	0.9	7.2	0.47	0.67	0.47	44.5
5	T1	All MCs	764	8.1	764	8.1	*0.468	19.8	LOS B	19.4	145.1	0.61	0.54	0.61	56.9
6	R2	All MCs	1	0.0	1	0.0	0.013	79.0	LOS F	0.1	0.5	0.97	0.59	0.97	26.3
Approach			797	8.2	797	8.2	0.468	20.0	LOS B	19.4	145.1	0.61	0.55	0.61	55.7
North: Wyndella Road															
7	L2	All MCs	1	0.0	1	0.0	0.011	50.3	LOS D	0.2	1.3	0.87	0.60	0.87	30.6
8	T1	All MCs	1	0.0	1	0.0	0.011	56.5	LOS E	0.2	1.3	0.87	0.60	0.87	28.4
9	R2	All MCs	1	0.0	1	0.0	0.011	61.1	LOS E	0.2	1.3	0.87	0.60	0.87	30.7
Approach			3	0.0	3	0.0	0.011	55.9	LOS D	0.2	1.3	0.87	0.60	0.87	29.9
West: New England Highway															
10	L2	All MCs	1	0.0	1	0.0	0.378	25.3	LOS B	14.7	109.3	0.60	0.53	0.60	46.2
11	T1	All MCs	782	7.4	782	7.4	0.378	18.3	LOS B	14.7	109.4	0.60	0.53	0.60	57.2
12	R2	All MCs	26	12.0	26	12.0	*0.359	82.7	LOS F	1.9	14.5	1.00	0.72	1.00	25.6
Approach			809	7.5	809	7.5	0.378	20.4	LOS B	14.7	109.4	0.62	0.54	0.62	55.0
All Vehicles			1775	7.8	1775	7.8	0.468	24.6	LOS B	19.4	145.1	0.65	0.56	0.65	50.6

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.
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	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sprinfield Drive												
P1	Full	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92

MOVEMENT SUMMARY

Site: 101 [2023AM + development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

New England Hwy / Wyndella Road / Sprinfield Drive signals
2021 counts increased by 4 %
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Sprinfield Drive															
1	L2	All MCs	38	22.2	38	22.2	0.195	44.1	LOS D	1.8	14.8	0.93	0.72	0.93	32.7
2	T1	All MCs	7	0.0	7	0.0	*0.467	69.2	LOS E	4.6	32.8	1.00	0.76	1.00	25.1
3	R2	All MCs	126	3.3	126	3.3	0.467	73.7	LOS F	4.6	32.8	1.00	0.76	1.00	26.6
Approach			172	7.4	172	7.4	0.467	67.0	LOS E	4.6	32.8	0.98	0.75	0.98	27.7
East: New England Highway															
4	L2	All MCs	32	10.0	32	10.0	0.033	22.4	LOS B	0.9	7.2	0.47	0.67	0.47	44.5
5	T1	All MCs	764	8.1	764	8.1	*0.469	19.8	LOS B	19.4	145.1	0.61	0.54	0.61	56.9
6	R2	All MCs	17	0.0	17	0.0	0.212	81.8	LOS F	1.2	8.3	1.00	0.69	1.00	25.8
Approach			813	8.0	813	8.0	0.469	21.2	LOS B	19.4	145.1	0.62	0.55	0.62	54.5
North: Wyndella Road															
7	L2	All MCs	38	0.0	38	0.0	0.202	53.6	LOS D	3.8	26.5	0.90	0.74	0.90	30.3
8	T1	All MCs	16	0.0	16	0.0	*0.202	60.7	LOS E	3.8	26.5	0.90	0.74	0.90	28.1
9	R2	All MCs	11	0.0	11	0.0	0.202	65.2	LOS E	3.8	26.5	0.90	0.74	0.90	30.3
Approach			64	0.0	64	0.0	0.202	57.3	LOS E	3.8	26.5	0.90	0.74	0.90	29.7
West: New England Highway															
10	L2	All MCs	5	0.0	5	0.0	0.380	25.3	LOS B	14.8	110.0	0.60	0.54	0.60	46.1
11	T1	All MCs	782	7.4	782	7.4	0.380	18.4	LOS B	14.8	110.1	0.60	0.53	0.60	57.1
12	R2	All MCs	26	12.0	26	12.0	*0.359	82.7	LOS F	1.9	14.5	1.00	0.72	1.00	25.6
Approach			814	7.5	814	7.5	0.380	20.5	LOS B	14.8	110.1	0.62	0.54	0.62	54.9
All Vehicles			1862	7.5	1862	7.5	0.469	26.3	LOS B	19.4	145.1	0.66	0.57	0.66	48.9

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.
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	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sprinfield Drive												
P1	Full	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92

MOVEMENT SUMMARY

Site: 101 [URA full Development AM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

New England Hwy / Wyndella Road / Sprinfield Drive signals
2021 counts increased by 4 %
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Sprinfield Drive															
1	L2	All MCs	98	8.6	98	8.6	0.461	49.8	LOS D	4.8	35.9	0.97	0.77	0.97	33.4
2	T1	All MCs	7	28.6	7	28.6	*0.789	75.0	LOS F	7.9	59.9	1.00	0.92	1.20	24.1
3	R2	All MCs	208	9.1	208	9.1	0.789	79.6	LOS F	7.9	59.9	1.00	0.92	1.20	25.3
Approach			314	9.4	314	9.4	0.789	70.1	LOS E	7.9	59.9	0.99	0.87	1.13	27.3
East: New England Highway															
4	L2	All MCs	56	5.7	56	5.7	0.056	22.6	LOS B	1.7	12.4	0.48	0.69	0.48	44.4
5	T1	All MCs	1264	7.6	1264	7.6	0.780	33.9	LOS C	41.8	311.4	0.77	0.70	0.77	53.1
6	R2	All MCs	23	9.1	23	9.1	0.310	95.4	LOS F	1.6	12.4	1.00	0.71	1.00	25.6
Approach			1343	7.5	1343	7.5	0.780	34.5	LOS C	41.8	311.4	0.76	0.70	0.76	46.4
North: Wyndella Road															
7	L2	All MCs	65	3.2	65	3.2	0.338	54.7	LOS D	6.3	46.3	0.92	0.77	0.92	29.8
8	T1	All MCs	23	9.1	23	9.1	*0.338	62.0	LOS E	6.3	46.3	0.92	0.77	0.92	27.9
9	R2	All MCs	17	6.3	17	6.3	0.338	66.6	LOS E	6.3	46.3	0.92	0.77	0.92	29.6
Approach			105	5.0	105	5.0	0.338	58.2	LOS E	6.3	46.3	0.92	0.77	0.92	29.3
West: New England Highway															
10	L2	All MCs	23	9.1	23	9.1	*0.825	44.1	LOS D	47.8	353.0	1.00	0.92	1.00	39.9
11	T1	All MCs	1518	6.4	1518	6.4	0.825	34.1	LOS C	47.8	353.0	0.91	0.84	0.91	49.9
12	R2	All MCs	56	5.7	56	5.7	*0.729	85.9	LOS F	4.1	30.3	1.00	0.82	1.19	25.0
Approach			1597	6.4	1597	6.4	0.825	36.1	LOS C	47.8	353.0	0.91	0.84	0.92	44.4
All Vehicles			3359	7.1	3359	7.1	0.825	39.3	LOS C	47.8	353.0	0.86	0.78	0.88	42.0

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.
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	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sprinfield Drive												
P1	Full	10	11	64.2	LOS F	0.0	0.0	0.96	0.96	218.0	200.0	0.92

MOVEMENT SUMMARY

Site: 101 [URA full Development AM + development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

New England Hwy / Wyndella Road / Sprinfield Drive signals
2021 counts increased by 4 %
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 140 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Sprinfield Drive															
1	L2	All MCs	98	8.6	98	8.6	0.461	49.9	LOS D	4.8	35.9	0.97	0.77	0.97	33.4
2	T1	All MCs	14	15.4	14	15.4	*0.810	75.9	LOS F	8.2	62.1	1.00	0.94	1.22	24.0
3	R2	All MCs	208	9.1	208	9.1	0.810	80.4	LOS F	8.2	62.1	1.00	0.94	1.22	25.1
Approach			320	9.2	320	9.2	0.810	70.9	LOS F	8.2	62.1	0.99	0.89	1.15	27.1
East: New England Highway															
4	L2	All MCs	56	5.7	56	5.7	0.056	22.6	LOS B	1.7	12.4	0.48	0.69	0.48	44.4
5	T1	All MCs	1264	7.6	1264	7.6	0.785	34.0	LOS C	41.8	311.7	0.77	0.71	0.77	53.0
6	R2	All MCs	39	5.4	39	5.4	0.508	96.4	LOS F	2.8	20.5	1.00	0.74	1.01	25.4
Approach			1359	7.4	1359	7.4	0.785	35.3	LOS C	41.8	311.7	0.77	0.71	0.77	45.8
North: Wyndella Road															
7	L2	All MCs	102	2.1	102	2.1	0.533	57.4	LOS E	10.6	75.9	0.96	0.80	0.96	29.2
8	T1	All MCs	39	5.4	39	5.4	*0.533	65.3	LOS E	10.6	75.9	0.96	0.80	0.96	27.3
9	R2	All MCs	26	4.0	26	4.0	0.533	69.9	LOS E	10.6	75.9	0.96	0.80	0.96	29.1
Approach			167	3.1	167	3.1	0.533	61.2	LOS E	10.6	75.9	0.96	0.80	0.96	28.7
West: New England Highway															
10	L2	All MCs	27	7.7	27	7.7	*0.827	44.4	LOS D	48.2	355.7	1.00	0.92	1.00	39.7
11	T1	All MCs	1518	6.4	1518	6.4	0.827	34.5	LOS C	48.2	355.7	0.91	0.84	0.91	49.7
12	R2	All MCs	56	5.7	56	5.7	*0.729	85.9	LOS F	4.1	30.3	1.00	0.82	1.19	25.0
Approach			1601	6.4	1601	6.4	0.827	36.4	LOS C	48.2	355.7	0.91	0.84	0.92	44.2
All Vehicles			3447	6.9	3447	6.9	0.827	40.4	LOS C	48.2	355.7	0.87	0.79	0.89	41.3

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	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sprinfield Drive												

MOVEMENT SUMMARY

Site: 101 [2023PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

New England Hwy / Wyndella Road / Sprinfield Drive signals
2021 counts increased by 4 %
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 135 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Sprinfield Drive															
1	L2	All MCs	46	15.9	46	15.9	0.221	41.8	LOS C	2.1	16.4	0.93	0.73	0.93	33.9
2	T1	All MCs	1	0.0	1	0.0	*0.324	65.4	LOS E	3.1	22.3	0.98	0.74	0.98	25.7
3	R2	All MCs	95	3.3	95	3.3	0.324	69.9	LOS E	3.1	22.3	0.98	0.74	0.98	27.4
Approach			142	7.4	142	7.4	0.324	60.7	LOS E	3.1	22.3	0.97	0.74	0.97	29.2
East: New England Highway															
4	L2	All MCs	29	0.0	29	0.0	0.029	22.7	LOS B	0.9	6.1	0.49	0.68	0.49	44.3
5	T1	All MCs	780	4.6	780	4.6	*0.482	20.4	LOS B	19.8	144.0	0.64	0.56	0.64	56.3
6	R2	All MCs	1	0.0	1	0.0	0.013	76.1	LOS F	0.1	0.5	0.97	0.59	0.97	26.8
Approach			811	4.4	811	4.4	0.482	20.5	LOS B	19.8	144.0	0.63	0.57	0.63	55.3
North: Wyndella Road															
7	L2	All MCs	1	0.0	1	0.0	0.014	47.1	LOS D	0.2	1.6	0.86	0.62	0.86	31.2
8	T1	All MCs	1	0.0	1	0.0	0.014	53.1	LOS D	0.2	1.6	0.86	0.62	0.86	28.8
9	R2	All MCs	2	0.0	2	0.0	0.014	57.7	LOS E	0.2	1.6	0.86	0.62	0.86	31.2
Approach			4	0.0	4	0.0	0.014	53.9	LOS D	0.2	1.6	0.86	0.62	0.86	30.6
West: New England Highway															
10	L2	All MCs	1	0.0	1	0.0	0.408	26.2	LOS B	15.7	115.9	0.63	0.56	0.63	45.6
11	T1	All MCs	824	6.4	824	6.4	0.408	19.3	LOS B	15.7	116.0	0.63	0.56	0.63	56.4
12	R2	All MCs	35	15.2	35	15.2	*0.466	80.6	LOS F	2.4	19.1	1.00	0.74	1.00	25.9
Approach			860	6.7	860	6.7	0.466	21.8	LOS B	15.7	116.0	0.65	0.57	0.65	53.8
All Vehicles			1817	5.7	1817	5.7	0.482	24.3	LOS B	19.8	144.0	0.67	0.58	0.67	50.9

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.
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	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sprinfield Drive												
P1	Full	10	11	61.7	LOS F	0.0	0.0	0.96	0.96	215.5	200.0	0.93

MOVEMENT SUMMARY

Site: 101 [2023PM + development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

New England Hwy / Wyndella Road / Sprinfield Drive signals
2021 counts increased by 4 %
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 135 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Sprinfield Drive															
1	L2	All MCs	46	15.9	46	15.9	0.221	41.8	LOS C	2.1	16.4	0.93	0.73	0.93	33.9
2	T1	All MCs	17	0.0	17	0.0	*0.373	65.7	LOS E	3.7	26.1	0.99	0.75	0.99	25.9
3	R2	All MCs	95	3.3	95	3.3	0.373	70.3	LOS E	3.7	26.1	0.99	0.75	0.99	27.4
Approach			158	6.7	158	6.7	0.373	61.4	LOS E	3.7	26.1	0.97	0.74	0.97	28.8
East: New England Highway															
4	L2	All MCs	29	0.0	29	0.0	0.029	22.7	LOS B	0.9	6.1	0.49	0.68	0.49	44.3
5	T1	All MCs	780	4.6	780	4.6	*0.482	20.4	LOS B	19.8	144.0	0.64	0.56	0.64	56.3
6	R2	All MCs	38	0.0	38	0.0	0.459	80.4	LOS F	2.6	18.3	1.00	0.74	1.00	26.0
Approach			847	4.2	847	4.2	0.482	23.2	LOS B	19.8	144.0	0.65	0.57	0.65	52.7
North: Wyndella Road															
7	L2	All MCs	17	0.0	17	0.0	0.094	49.5	LOS D	1.7	11.8	0.87	0.70	0.87	31.3
8	T1	All MCs	7	0.0	7	0.0	*0.094	56.1	LOS D	1.7	11.8	0.87	0.70	0.87	28.9
9	R2	All MCs	6	0.0	6	0.0	0.094	60.7	LOS E	1.7	11.8	0.87	0.70	0.87	31.3
Approach			31	0.0	31	0.0	0.094	53.4	LOS D	1.7	11.8	0.87	0.70	0.87	30.7
West: New England Highway															
10	L2	All MCs	11	0.0	11	0.0	0.412	26.3	LOS B	15.9	117.5	0.64	0.57	0.64	45.5
11	T1	All MCs	824	6.4	824	6.4	0.412	19.3	LOS B	15.9	117.7	0.64	0.56	0.64	56.2
12	R2	All MCs	35	15.2	35	15.2	*0.466	80.6	LOS F	2.4	19.1	1.00	0.74	1.00	25.9
Approach			869	6.7	869	6.7	0.466	21.9	LOS B	15.9	117.7	0.65	0.57	0.65	53.6
All Vehicles			1905	5.5	1905	5.5	0.482	26.2	LOS B	19.8	144.0	0.68	0.59	0.68	49.1

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.
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	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sprinfield Drive												
P1	Full	10	11	61.7	LOS F	0.0	0.0	0.96	0.96	215.5	200.0	0.93

MOVEMENT SUMMARY

Site: 101 [URA full Development PM (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

New England Hwy / Wyndella Road / Sprinfield Drive signals
2021 counts increased by 4 %
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 115 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Sprinfield Drive															
1	L2	All MCs	305	6.9	305	6.9	*0.862	44.5	LOS D	12.9	95.7	1.00	0.95	1.22	34.8
2	T1	All MCs	23	9.1	23	9.1	0.644	53.3	LOS D	8.3	61.9	1.00	0.83	1.03	28.2
3	R2	All MCs	274	7.7	274	7.7	0.644	57.9	LOS E	8.3	61.9	1.00	0.82	1.03	29.8
Approach			602	7.3	602	7.3	0.862	50.9	LOS D	12.9	95.7	1.00	0.89	1.13	32.1
East: New England Highway															
4	L2	All MCs	109	8.7	109	8.7	0.153	30.7	LOS C	3.8	28.8	0.67	0.74	0.67	40.5
5	T1	All MCs	1021	7.2	1021	7.2	*0.855	44.5	LOS D	35.8	266.0	0.91	0.85	0.97	45.6
6	R2	All MCs	18	11.8	18	11.8	0.150	77.0	LOS F	1.0	7.6	0.97	0.70	0.97	29.2
Approach			1148	7.4	1148	7.4	0.855	43.7	LOS D	35.8	266.0	0.89	0.84	0.94	41.0
North: Wyndella Road															
7	L2	All MCs	55	3.8	55	3.8	0.294	39.9	LOS C	5.1	37.7	0.89	0.75	0.89	33.4
8	T1	All MCs	35	9.1	35	9.1	*0.294	48.7	LOS D	5.1	37.7	0.89	0.75	0.89	31.0
9	R2	All MCs	17	12.5	17	12.5	0.294	53.3	LOS D	5.1	37.7	0.89	0.75	0.89	32.7
Approach			106	6.9	106	6.9	0.294	44.9	LOS D	5.1	37.7	0.89	0.75	0.89	32.5
West: New England Highway															
10	L2	All MCs	7	28.6	7	28.6	0.739	38.4	LOS C	26.2	198.7	0.91	0.81	0.91	39.6
11	T1	All MCs	1102	9.3	1102	9.3	0.739	30.9	LOS C	26.3	198.8	0.91	0.81	0.91	47.8
12	R2	All MCs	67	6.3	67	6.3	0.545	66.6	LOS E	3.9	28.7	1.00	0.77	1.01	28.8
Approach			1177	9.2	1177	9.2	0.739	33.0	LOS C	26.3	198.8	0.92	0.81	0.92	46.0
All Vehicles			3034	8.1	3034	8.1	0.862	41.0	LOS C	35.8	266.0	0.92	0.84	0.97	40.1

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.
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	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sprinfield Drive												
P1	Full	10	11	51.7	LOS E	0.0	0.0	0.95	0.95	205.5	200.0	0.97

MOVEMENT SUMMARY

Site: 101 [URA full Development PM + development (Site Folder: General)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

New England Hwy / Wyndella Road / Sprinfield Drive signals
2021 counts increased by 4 %
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 115 seconds (Site Optimum Cycle Time - Minimum Delay)

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: Sprinfield Drive															
1	L2	All MCs	305	6.9	305	6.9	*0.862	44.5	LOS D	12.9	95.7	1.00	0.95	1.22	34.8
2	T1	All MCs	39	5.4	39	5.4	0.675	53.9	LOS D	8.8	65.7	1.00	0.85	1.05	28.1
3	R2	All MCs	274	7.7	274	7.7	0.675	58.5	LOS E	8.8	65.7	1.00	0.84	1.05	29.7
Approach			618	7.2	618	7.2	0.862	51.3	LOS D	12.9	95.7	1.00	0.90	1.13	31.9
East: New England Highway															
4	L2	All MCs	109	8.7	109	8.7	0.153	30.7	LOS C	3.8	28.8	0.67	0.74	0.67	40.5
5	T1	All MCs	1021	7.2	1021	7.2	*0.867	45.5	LOS D	36.4	270.9	0.92	0.86	0.99	45.0
6	R2	All MCs	55	3.8	55	3.8	0.435	78.4	LOS F	3.1	22.6	1.00	0.75	1.00	28.9
Approach			1185	7.2	1185	7.2	0.867	45.6	LOS D	36.4	270.9	0.90	0.85	0.96	39.9
North: Wyndella Road															
7	L2	All MCs	71	3.0	71	3.0	0.362	40.6	LOS C	6.5	47.3	0.90	0.77	0.90	33.2
8	T1	All MCs	41	7.7	41	7.7	*0.362	49.8	LOS D	6.5	47.3	0.90	0.77	0.90	30.8
9	R2	All MCs	21	10.0	21	10.0	0.362	54.4	LOS D	6.5	47.3	0.90	0.77	0.90	32.7
Approach			133	5.6	133	5.6	0.362	45.6	LOS D	6.5	47.3	0.90	0.77	0.90	32.4
West: New England Highway															
10	L2	All MCs	17	12.5	17	12.5	0.745	38.2	LOS C	26.6	200.9	0.91	0.82	0.91	39.6
11	T1	All MCs	1102	9.3	1102	9.3	0.745	31.0	LOS C	26.6	201.2	0.91	0.82	0.91	47.7
12	R2	All MCs	67	6.3	67	6.3	0.545	66.6	LOS E	3.9	28.7	1.00	0.77	1.01	28.8
Approach			1186	9.1	1186	9.1	0.745	33.1	LOS C	26.6	201.2	0.92	0.81	0.92	45.9
All Vehicles			3122	7.9	3122	7.9	0.867	42.0	LOS C	36.4	270.9	0.93	0.84	0.98	39.5

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	Crossing	Input Vol. ped/h	Dem. Flow ped/h	Aver. Delay sec	Level of Service	AVERAGE BACK OF QUEUE [Ped ped	Dist] m	Prop. Que	Eff. Stop Rate	Travel Time sec	Travel Dist. m	Aver. Speed m/sec
South: Sprinfield Drive												