TRAFFIC IMPACT ASSESSMENT

RESIDENTIAL PLANNING PROPOSAL

LOTS 274 – 277 & LOTS 280 – 283 IN DP 755231, LOT 1 IN DP 308003, LOT 2 IN DP 314641, LOT 1 IN DP 371151, LOT 1 IN DP 663726, LOTS 2731 – 2732 IN DP 884423, LOTS 2721 – 2722 IN DP1104897, LOT 1 IN DP 345294 AND LOTS 10 – 11 DP 710071.

15 – 59 SAWYERS GULLY ROAD, 19 – 133 METCALFE LANE, 156 FRAME DRIVE AND 52 – 152 GINGERS LANE, SAWYERS GULLY

PREPARED FOR: NEWQUEST PROPERTY PTY LTD

MAY 2021

20/158

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QUALITY ASSURANCE

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

Issue	Date	Description	By
A	28/04/21	Draft	JG
B	16/05/21	Edit	JG
C	27/05/21	Final Proof	JG
D	27/05/21	Approved	JG

This document has been authorised by

Date 27th May 2021

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1.0 INTRODUCTION

Intersect Traffic Pty Ltd (Intersect Traffic) has been engaged by Perception Planning on behalf of Newquest Property to prepare a Traffic Impact Assessment for a residential planning proposal on 19 separate lots within the Ginger's Lane sub-precinct bordered by Frame Drive, Gingers Lane, Sawyers Gully Road and Metcalfe Lane, Sawyers Gully. The proposal seeks to rezone the land from RU2 Rural Landscape to R5 Large Lot Residential while the Subdivision Plan yields approximately 374 lots with lot sizes ranging from 800m^2 to in excess of 2,000m^2 as shown in the concept subdivision plan in ***Attachment A***.

Vehicular access to the subdivision is proposed from Gingers Lane as a public road between the existing Grey Gum Drive and Woodlands Drive intersections as well as three (3) public road accesses to Metcalfe Lane approximately 600 metres east of Frame Drive, 280 metres west of Sawyers Gully Road and 700 metres west of Sawyers Gully Road. The subject site is primarily rural land currently used for agricultural purposes.

This report is required to support a planning proposal to Cessnock City Council as the consent authority for the rezoning of the land to support the proposed development. It will allow the Council to assess the proposal regarding its traffic impacts on the local and state road network.

This report presents the findings of the traffic assessment and includes the following:

1. An outline of the existing situation near the site.
2. An assessment of the traffic impacts of the proposed development including the predicted traffic generation and its impact on existing road and intersection capacities.
3. Determines any triggers for the provision of additional infrastructure.
4. Review's parking, public transport, pedestrian, and cycle way requirements for the proposed development, including assessment against Council's DCP and Australian Standard requirements.
5. Presentation of conclusions and recommendations.

2.0 SITE LOCATION

The subject site is located between Frame Drive and Sawyers Gully Road, Sawyers Gully immediately north of Gingers Lane and south of Metcalfe Lane. The site is approximately 2.4 km north-west of Kurri Kurri CBD and 9.4 km north-east of the Cessnock CBD. The site is only 1 km west of the Hart Road partial interchange to the Hunter Expressway providing eastbound on and westbound off access to the expressway. ***Figure 1*** below shows the site location from a local context. The site will be accessed directly from Gingers Lane via a new public road access (T-intersection) approximately 830 metres west of the recently constructed Sawyers Gully Road / Gingers Lane / Hart Road roundabout as well as three (3) public road accesses to Metcalfe Lane approximately 600 metres east of Frame Drive, 280 metres west of Sawyers Gully Road and 700 metres west of Sawyers Gully Road. All four (4) public road access intersections are to be constructed to Cessnock City Council requirements. ***Photographs 1*** and ***2*** below show the existing site conditions from Gingers Lane and Metcalfe Lane.

The site currently contains 19 separate semi-rural properties titled and addressed as shown below in ***Table 1***. Pursuant to the Cessnock City Council Local Environmental Plan (2011) the site is currently zoned RU2 – Rural Landscape and has an area of approximately 96.1 ha. The planning proposal seeks to rezone the site to R5 – Large Lot Residential, R2 - Low Density Residential and E2 - Environmental Conservation.

Table 1 – Site Title and Address Details

No.	Street	Locality	Lot	DP
40	Gingers Lane	Sawyers Gully	1	345294
52	Gingers Lane	Sawyers Gully	10	710071
60	Gingers Lane	Sawyers Gully	11	710071
72	Gingers Lane	Sawyers Gully	280	755231
102	Gingers Lane	Sawyers Gully	281	755231
152	Gingers Lane	Sawyers Gully	282	755231
176	Gingers Lane	Sawyers Gully	283	755231
156	Frame Drive	Sawyers Gully	2721	1104897
19	Metcalfe Lane	Sawyers Gully	276	755231
31	Metcalfe Lane	Sawyers Gully	275	755231
101	Metcalfe Lane	Sawyers Gully	274	755231
107	Metcalfe Lane	Sawyers Gully	2732	884423
131	Metcalfe Lane	Sawyers Gully	2731	884423
133	Metcalfe Lane	Sawyers Gully	2722	1104897
15	Sawyers Gully Road	Sawyers Gully	1	308003
27	Sawyers Gully Road	Sawyers Gully	2	314641
37	Sawyers Gully Road	Sawyers Gully	1	663726
43	Sawyers Gully Road	Sawyers Gully	277	755231
59	Sawyers Gully Road	Sawyers Gully	276	755231

Photograph 1 – Development site from Gingers Lane.

Photograph 2 – Development site from Metcalfe Lane.

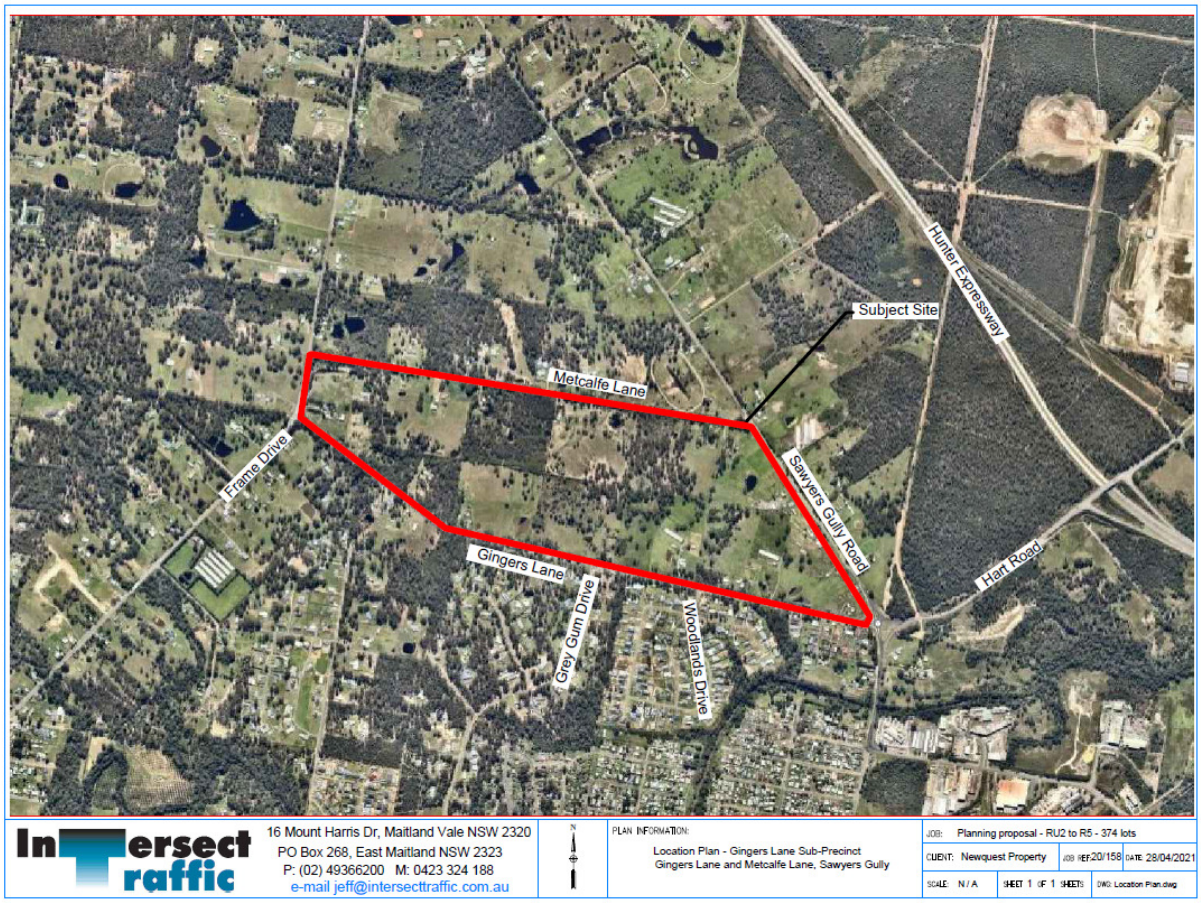


Figure 1 – Site Location

3.0 EXISTING ROAD NETWORK

Ginger's Lane

Ginger's Lane, Sawyers Gully is a local collector road under the care and control of Cessnock City Council. It collects and distributes traffic from the Sawyer's Gully area to the higher order road network at Sawyers Gully Road and Frame Drive which in turn distributes traffic to the sub-arterial and arterial road network at Cessnock Road, Bishops Bridge Road and the M15 Hunter Expressway (via Hart Road). It also provides vehicular access to properties along its length.

Near the site Ginger's Lane is a two-lane two-way sealed rural road with sealed shoulders, a marked centre line and edge lines. ***Photograph 3*** below shows that Gingers Lane is in excellent condition having only recently been reconstructed. Lane widths are 3.5m with 1.5m width sealed shoulders and a speed limit of 80 km/h is in force for the majority of Gingers Lane except near the new Sawyers Gully Road / Government Road / Hart Road / Gingers Lane roundabout where a speed zoning of 60 km/h applies. Gingers Lane intersects with Frame Drive via a recently constructed channelised right turn (CHR) / basic left turn (BAL) intersection layout.

Metcalfe Lane

Metcalfe Lane, Sawyers Gully is a local rural road under the care and control of Cessnock City Council. Its primary function is to provide vehicular access to properties along its length. Near the site Metcalfe Lane is generally a two-lane two-way unsealed road though there are a couple of isolated short lengths of dust abatement seal along its length. ***Photograph 4*** below shows that Metcalfe Lane is in fair condition with a pavement width of approximately 6.5m and a speed limit of 80 km/h is in force for the majority of Metcalfe Lane. Metcalfe Lane intersects with both Sawyers

Gully Road and Frame Drive as modified basic right turn (BAR) / basic left turn (BAL) intersection layouts.

Photograph 3 – Gingers Lane near the site.

Photograph 4 – Metcalfe Lane near the site.

Sawyers Gully Road

Sawyers Gully Road is part of a classified regional road (RR7766) that connects the Sawyers Gully area to the sub-arterial road network at Kurri Kurri (Northcote Street) and Greta (New England Highway). It also provides vehicular access to properties along its length. As such the road is under the care and control of Cessnock City Council however Council receives funding assistance for maintenance of the road from Transport for NSW (TfNSW).

Near the site Sawyers Gully Road is a two-lane two-way sealed rural road (lane widths 3m) with sealed shoulders (0 – 1 m width), a marked centre line and edge lines. ***Photograph 5*** below shows that Sawyers Gully Road is in fair condition and a speed limit of 80 km/h is in force for the majority of Sawyers Gully Road except near the new Sawyers Gully Road / Government Road / Hart Road / Gingers Lane roundabout where a speed zoning of 60 km/h applies.

Photograph 5 – Sawyers Gully Road near the site.

Frame Drive

Frame Drive, Sawyers Gully is a local collector road under the care and control of Cessnock City Council. It collects and distributes traffic from the Sawyer's Gully area to the sub-arterial road network at Sawyers Gully Road, north of the site, and Cessnock Road (via Orange Street) as well as providing vehicular access to properties along its length.

Near the site Frame Drive is a two-lane two-way sealed rural road with sealed shoulders, a marked centre line and edge lines. ***Photograph 6*** below shows that Frame Drive is in good to excellent condition with parts of the road having only recently been reconstructed. Lane widths are 3.5m with 1.5m width sealed shoulders and a speed limit of 80 km/h is in force for the majority of Frame Drive except near its connection to Orange Street in the Abermain village area where a speed zoning of 60 km/h applies. Frame Drive intersects with Frame Drive via a BAR / BAL intersection layout approximately 2 km north of Gingers Lane. Frame Drive connects to Cessnock Road (via Orange Street) via a BAR / BAL intersection treatment as shown in ***Photograph 7*** below.

Photograph 6 – Frame Drive near the site.

Photograph 7 – Cessnock Road / Frame Drive (Orange Street) intersection.

4.0 ROAD NETWORK IMPROVEMENTS

A review of Council's Traffic and Transport Strategy and its Infrastructure Contributions Plan (2020) indicates there is only one future road network improvement that would have any impact on the adjoining local road network and that is the following project identified in the Traffic and Transport Strategy for 2031.

- Sawyers Gully Interchange: A new full interchange at Old Maitland Road and HEX.

This project along with planned upgrades of Old Maitland Road through to Cessnock would potentially reduce traffic volumes on Sawyers Gully Road, Gingers Lane, Frame Drive and Cessnock Road near the site as Cessnock bound or origin traffic seeking to access HEX would utilise Old Maitland Road and the new interchange rather than use the Hart Road interchange. However this project is yet to be funded and still only on the 'wish list' therefore is ignored in this assessment.

Transport for NSW and Council have also advised that the Cessnock Road / Orange Street intersection is to be upgraded to traffic signal control with funding already approved for construction. Both organisations have advised the works on the intersection will be complete within 12 months therefore given the timeframes involved with this planning proposal this assessment has assumed the Cessnock Road / Orange Street intersection has been upgraded to traffic signals as per the concept design provided in ***Attachment C***.

Maintenance and reconstruction works on the existing road network would be undertaken in line with Cessnock City Council's annual works programs but these would not increase the available capacity within the adjoining road network.

5.0 TRAFFIC VOLUMES

To determine existing traffic volumes on the road network near the site, Northern Transport Planning and Engineering (NTPE) carried out intersection traffic counts for Intersect Traffic during the morning and afternoon peak periods on Wednesday 23rd March 2021 at the following intersections;

- Sawyers Gully Road / Gingers Lane / Hart Road / Government Road roundabout;
- Frame Drive / Gingers Lane intersection;
- Cessnock Road / Orange Street intersection;
- Sawyers Gully Road / Metcalfe Lane intersection; and
- Frame Drive / Metcalfe Lane intersection.

The weekday peak traffic periods were found to be between the hours of 7.15 am and 9 am for the AM peak and between the hours of 3 pm and 5.45 pm for the PM peak. The existing two-way mid-block traffic volumes for the adjoining road network extracted from this data and the likely 2031 traffic volumes based on an assumption of a 1.5 % background traffic growth recommended by Transport for NSW (TfNSW) for the lower Hunter area shown in ***Table 2*** below. These existing and future traffic volumes have been adopted in this assessment.

Table 2– Mid-block peak hour traffic volume data from NTPE (August 2017)

Road	Section	2021 AM peak vtph	2021 PM peak vtph	2031 AM peak vtph	2031 PM peak vtph
Sawyers Gully Road	north of Gingers Lane	437	507	507	588
Gingers Lane	west of Sawyers Gully Road	407	457	472	530
Government Road	south of Sawyers Gully Road	757	877	879	1018
Hart Road	east of Sawyers Gully Road	905	897	1050	1041
Gingers Lane	east of Frame Drive	378	415	439	482
Frame Drive	north of Gingers Lane	206	223	239	259
Frame Drive	south of Gingers Lane	523	568	607	659
Orange Street / Frame Drive	north of Cessnock Road	362	399	420	463
Cessnock Road	west of Orange Street	1545	1635	1793	1897
Cessnock Road	east of Orange Street	1379	1446	1600	1678
Metcalfe Lane	west of Sawyers Gully Road	5	10	6	12
Sawyers Gully Road	north of Metcalfe Lane	436	495	506	574
Metcalfe Lane	east of Frame Drive	5	10	6	12
Frame Drive	north of Metcalfe Lane	201	215	233	250

6.0 ROAD CAPACITY

In this assessment it is assumed that on completion of the development all roads around the site will be urban roads having speed zonings less than or equal to 80 km/h. The capacity of urban roads is generally determined by the capacity of intersections. However, Table 4.3 of the *RTA's Guide to Traffic Generating Developments* provides some guidance on mid-block capacities for urban roads. Table 4.3 of the *RTA's Guide to Traffic Generating Developments* is reproduced below.

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

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

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

Assuming all roads on the adjoining road network will remain two-way two-lane urban roads then the two-way mid-block capacity of the adjoining road network based on the above table will be at least 1,800 vtph. Cessnock Road as a major sub-arterial road would however still be considered to be operating satisfactorily with a LoS D and lane capacities of up to 1,100 vtph. Therefore, the two-way mid-block capacity of Cessnock Road would be 2,200 vtph

Within the development all roads will contain residential dwellings and the environmental road capacity thresholds provided within Table 4.6 of the RMS' *Guide to Traffic Generating Developments* (reproduced below) are of more relevance when considering the capacity of the internal road network.

Table 4.6
Environmental capacity performance standards on residential streets

Road class	Road type	Maximum Speed (km/hr)	Maximum peak hour volume (veh/hr)
Local	Access way	25	100
	Street	40	200 environmental goal
			300 maximum
Collector	Street	50	300 environmental goal
			500 maximum

Note: Maximum speed relates to the appropriate design maximum speeds in new residential developments. In existing areas maximum speed relates to 85th percentile speed.

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

Therefore the internal collector roads should be limited to 500 vtph and the local streets should be restricted to 300 vtph.

7.0 ALTERNATE TRANSPORT MODES

Rover Motors bus routes 164 (Cessnock to Maitland) and 171 (Kurri Kurri to Weston) provide the nearest public transport connections to Maitland and Cessnock / Kurri Kurri. The nearest bus stops are located on Ninth Street, Weston and First Street, Weston approximately 600 metres and 1.5 kms south of the site respectively. It is therefore concluded the site is currently not conveniently serviced by public transport services.

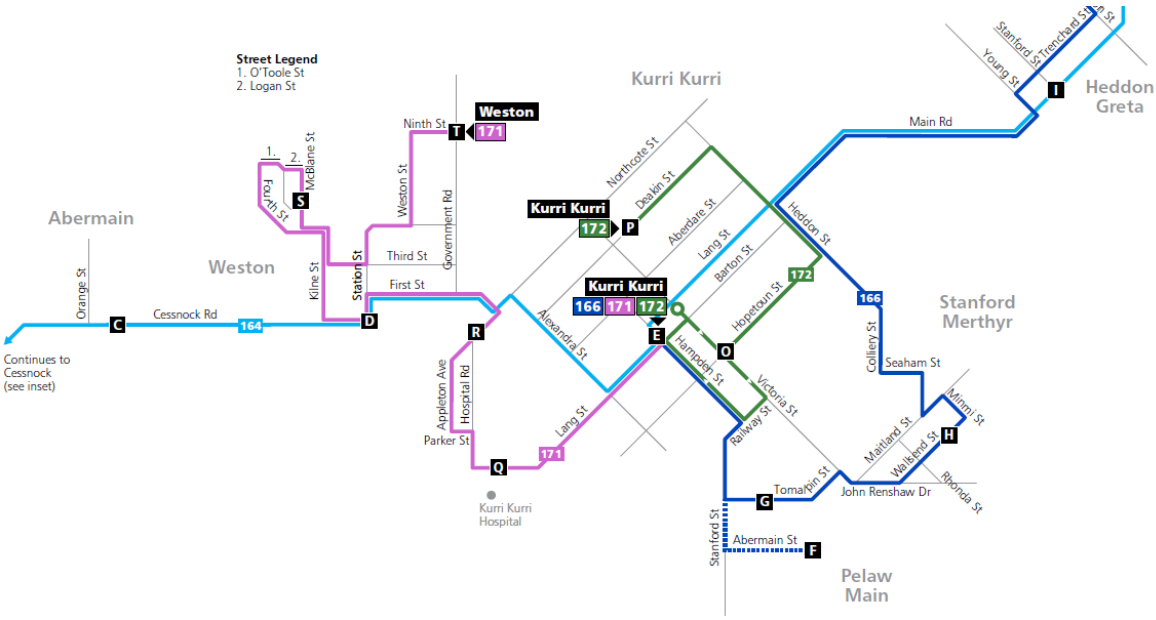


Figure 2 – Local Bus Routes 164 & 171

As currently a predominantly rural area there are no constructed hardstand footpaths near the site, except for an isolated section of constructed footpath in the vicinity of the new roundabout at the Sawyers Gully Road / Gingers Lane / Government Road / Hart Road roundabout. Therefore, pedestrians currently would be required to utilise the road shoulder or verges. Similarly, there are no designated on or off road cycle ways in the vicinity of the site therefore cyclists using the road network would utilise the road shoulders or share the traffic lanes where necessary.

8.0 DEVELOPMENT PROPOSAL

The planning proposal involves the rezoning of land contained within the Gingers Lane precinct in Sawyers Gully bordered by Sawyers Gully Road, Frame Drive, Gingers Lane and Metcalfe Lane to permit the proposed residential development of up to 374 lots to be constructed on the site. The proposal will include construction of approximately eleven (11) new public roads servicing the new allotments.

The development plan is provided within ***Attachment A*** and shows the roads connection within the residential subdivision. All new internal roads, connections and other roadside infrastructure would be constructed to the requirements of Cessnock City Council's DCP (2011) and Engineering Requirements for Development.

Access to Gingers Lane is proposed via a single priority controlled T-intersection approximately 830 metres west of Sawyers Gully Road. Access to Metcalfe Lane will be via three separate priority controlled T-intersections approximately 600 metres east of Frame Drive, 280 metres west of Sawyers Gully Road and 700 metres west of Sawyers Gully Road. These intersections will also be constructed to Cessnock City Council and Austroads requirements as conditioned on any future DA consent.

A total of twenty four (24) internal road intersections are proposed of which twenty (20) will be suitably staggered priority controlled give way T-intersections and four (4) will be priority controlled give way cross intersections. These cross intersections will be on a direct link from Metcalfe Lane to Gingers Lane and will have the priority control such to reduce speeds along this link and discourage its use as a 'rat run' i.e. give way signs will be on the direct link giving priority to the roads running parallel with Metcalfe Lane and Gingers Lane.

9.0 TRAFFIC GENERATION

The *RTA's Guide to Traffic Generating Development's (2002)* provides specific advice on the traffic generation potential of various land uses. However, the NSW RMS released a Technical Direction (TDT 2013/4) in 2013 releasing the results of updated traffic surveys and as a result amended land use traffic generation rates.

Regarding low density residential dwellings, the following amended advice is provided within the Technical Direction.

Rates.

Daily vehicle trips = 10.7 per dwelling in Sydney, 7.4 per dwelling in regional areas

Weekday average evening peak hour vehicle trips = 0.99 per dwelling in Sydney (maximum 1.39), 0.78 per dwelling in regional areas (maximum 0.90).

Weekday average morning peak hour vehicle trips = 0.95 per dwelling in Sydney (maximum 1.32), 0.71 per dwelling in regional areas (maximum 0.85).

*(The above rates do **not** include trips made internal to the subdivision, which may add up to an additional 25 %).*

Therefore, based on the above data and assuming maximum rates the peak hour traffic generation from the proposed subdivision can be estimated as follows:

Daily vehicle trips = 374 dwellings x 7.4 trips per dwelling
= 2,768 vtpd.

Weekday AM peak hour = 374 dwellings x 0.85 trips per dwelling
= 318 vtph.

Weekday PM peak hour = 374 dwellings x 0.9 trips per dwelling
= 337 vtph.

These values have been adopted for assessment purposes.

10.0 TRIP DISTRIBUTION

Before carrying out any traffic assessment the additional peak hour traffic generated by the development needs to be distributed through the adjoining road network. This involves making several assumptions as to distribution patterns to and from the development. In distributing the peak hour traffic through the adjacent road network, the following assumptions have been made for this site based on likely origin / destinations for traffic generated by the development.

- In the AM peak 80% of trips will be outbound and 20% of trips will be inbound;
- In the PM peak 30% of trips will be outbound and 70% of trips will be inbound; and
- The trip origin / destination is 50% north toward Maitland and 50% south towards the Hunter Expressway;
- At Gingers Lane and Metcalfe Lane 60% of traffic will have an origin / destination to the east and 40% of traffic will have an origin / destination to the west.
- At Frame Drive 90% of traffic will have an origin / destination to the south and 10% of traffic will have an origin / destination to the north;
- At the Sawyers Gully Road / Metcalfe Lane intersection 90% of traffic will have an origin / destination to the south and 10% of traffic will have an origin / destination to the north;
- At the Sawyers Gully Road / Gingers Lane / Government Road / Hart Road roundabout 75 % of traffic will have an origin / destination to the east to and from HEX, 15 % of traffic will have an origin / destination south to and from Kurri Kurri and Weston and 10% of traffic will have an origin / destination north to and from the Pokolbin, Rothbury and Greta areas; and
- At the Cessnock Road / Orange Street (Frame Drive) intersection 65 % of traffic has an origin / destination west to Cessnock while 35 % of traffic has an origin / destination east to Weston.

In addition based on the internal road and lot layout the following lot yields per access intersection have been adopted;

- Gingers Lane access – 250 lots – 213 vtph (AM) and 225 vtph (PM).
- Metcalfe Lane access western end near Frame Drive – 60 lots - 51 vtph (AM) and 54 vtph (PM).
- Metcalfe Lane access eastern end near Sawyers Gully Road – 40 lots – 34 vtph (AM) and 36 vtph (PM); and
- Metcalfe Lane middle access – 24 lots – 21 vtph (AM) and 22 vtph (PM).

Based on these assumptions the likely trip distributions at the critical road network intersections are as shown in ***Figure 3***.

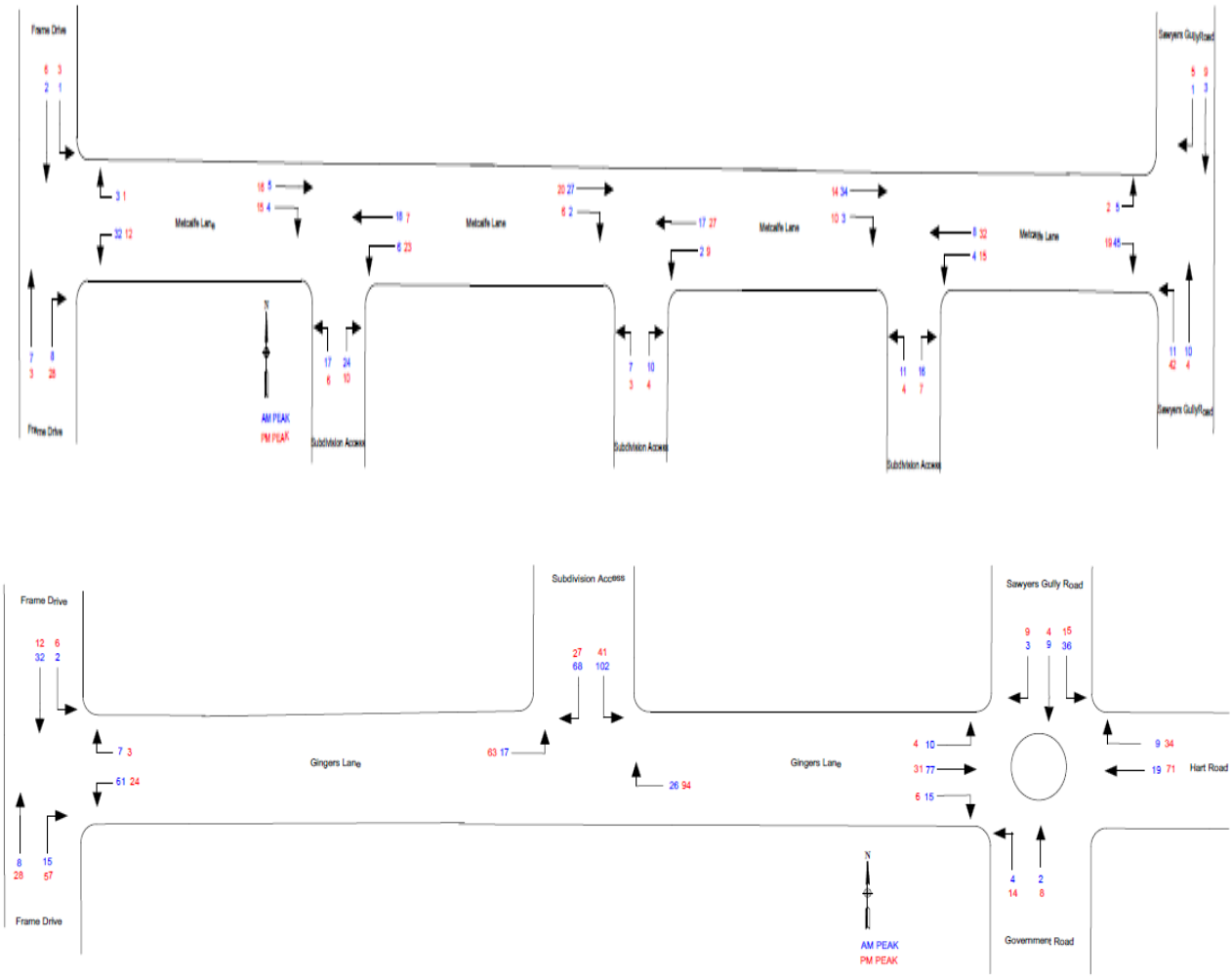


Figure 3 – Development Traffic Trip Distribution.

11.0 TRAFFIC IMPACTS OF DEVELOPMENT

11.1 Road Network Capacity

It has previously been shown in ***Section 6*** of this report that the local road network is currently operating within its technical mid-block capacity. The planning proposal is likely to generate 318 vtph in the AM peak and 337 vtph in the PM peak distributed onto the local road network as shown in ***Figure 3***. The addition of this traffic onto the existing traffic volumes on the local road network determined in ***Section 5*** will not result in the two-way mid-block capacity thresholds for the road network, determined in ***Section 6*** as demonstrated below in ***Table 3***.

Table 3 – Two way mid-block capacity assessment

Road	Section	Capacity vtph	2021 AM peak vtph	2021 PM peak vtph	2031 AM peak vtph	2031 PM peak vtph	Development peaks (vtph)	
							AM	PM
Sawyers Gully Road	north of Gingers Lane	1800	505	581	575	662	68	74
Gingers Lane	west of Sawyers Gully Road	1800	535	592	600	665	128	135
Government Road	south of Sawyers Gully Road	1800	787	909	909	1050	30	32
Hart Road	east of Sawyers Gully Road	1800	1046	1048	1191	1192	141	151
Gingers Lane	east of Frame Drive	1800	463	505	524	572	85	90
Frame Drive	north of Gingers Lane	1800	255	272	288	308	49	49
Frame Drive	south of Gingers Lane	1800	639	689	723	780	116	121
Orange Street / Frame Drive	north of Cessnock Road	1800	476	520	534	584	114	121
Cessnock Road	west of Orange Street	2200	1619	1713	1867	1975	74	78
Cessnock Road	east of Orange Street	2200	1419	1489	1640	1721	40	43
Metcalfe Lane	west of Sawyers Gully Road	1800	67	78	68	80	62	68
Sawyers Gully Road	north of Metcalfe Lane	1800	445	511	515	590	9	16
Metcalfe Lane	east of Frame Drive	1800	49	54	50	56	44	44
Frame Drive	north of Metcalfe Lane	1800	214	228	246	263	13	13

It is therefore reasonable to conclude that the proposed planning proposal will not adversely impact on the two-way mid-block road capacity of the local and state road network around the site.

11.2 Intersection Capacity

In assessing intersection performance, the likely post development traffic flows (2030) first need to be considered. These are shown in ***Table 4*** below.

Table 4 – Post Development Intersection Flows.

Intersections	Major Road Flow vtph	Minor Road Flow vtph
Gingers Lane / Hart Road / Sawyers Gully Road	1192	1050
Gingers Lane / Frame Drive	572	780
Cessnock Road / Orange Street	1975	584
Frame Drive / Metcalfe Lane	308	56
Sawyers Gully Road / Metcalfe Lane	662	80
Gingers Lane / Subdivision access	665	225
Metcalfe Lane / Subdivision access *	80	54
Internal subdivision accesses *	225	112
* busiest.		

Austroads *Guide to Traffic Management Part 6 – Intersections, Interchanges and Crossings (2010),* provides a table that identifies the thresholds for intersections having uninterrupted flow conditions, reproduced below in ***Table 5.*** The Guide state that if traffic volumes are not above these thresholds, then uninterrupted flow conditions can be assumed and little or no delay will be experienced by motorists at these intersections. No further intersection analysis is then required.

Table 5 – Uninterrupted flow condition thresholds at an intersection

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

Source: - Austroads Guide to Traffic Management – Part 6: Intersections, Interchanges and Crossings (2010).

Based on this table it is reasonable to conclude that the following intersections will continue to operate with uninterrupted flow conditions and thus need no further analysis within this report.

- Frame Drive / Metcalfe Lane intersection;
- Sawyers Gully Road / Metcalfe Lane intersection;
- Metcalfe Lane / Subdivision accesses; and
- All internal subdivision accesses.

The intersections requiring further analysis are;

- Gingers Lane / Sawyers Gully Road / Hart Road / Government Road roundabout;
- Frame Drive / Gingers Lane (CHR/BAL) give way priority controlled intersection;
- Cessnock Road / Orange Street stop priority controlled intersection; and
- Gingers Lane / Subdivision access

The impacts of the development are best assessed using the SIDRA Intersection modelling software. This software package predicts likely delays, queue lengths and thus levels of service that will occur at intersections. Assessment is then based on the level of service requirements of TfNSW as shown below in ***Table 6.***

Table 6 – TfNSW intersection performance criteria

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).

Assumptions made in this modelling were:

- The new subdivision intersection layout will be modelled as a priority controlled (give way) channelised right turn and basic left turn urban T-intersection given the through traffic volumes and turning traffic volumes at the intersection is likely to require such an intersection layout based on the Austroad turn lane warrant graphs. This is assessed later in this report.
- Existing intersections were modelled as constructed.
- Traffic volumes used in the modelling are as collected by NTPE (***Section 5***).
- Traffic generated by the planning proposal is distributed as per ***Figure 3.***
- Future traffic growth predicted using a 1.5 % per annum background traffic growth rate as recommended by TfNSW for the lower Hunter area.

The results of the modelling are summarised in ***Tables 7, 8, 9 & 10*** below for the 'all vehicles' case with the worst movement LoS (i.e. average delay). The Sidra Movement Summary Tables are provided in ***Attachment D***.

Table 7 – Gingers Lane / Sawyers Gully Road / Hart Road roundabout - Sidra Modelling Results Summary

Model Scenario	Degree of Saturation (v/c)	Average Delay (s)	LoS	95% back of Queue Length (veh.)
2021 AM + development	0.446	7.9	A	3.3
2021 PM + development	0.583	8.5	A	5.4
2031 AM + development	0.516	8.7	A	4.2
2031 PM + development	0.712	10.3	A	8.7

Table 8 – Gingers Lane / Frame Drive Give Way T intersection - Sidra Modelling Results Summary

Model Scenario	Degree of Saturation (v/c)	Worst Average Delay (s)	Worst LoS	95% back of Queue Length (veh.)
2021 AM + development	0.150	9.3	A	0.7
2021 PM + development	0.194	8.8	A	0.9
2031 AM + development	0.169	9.7	A	0.8
2031 PM + development	0.225	9.2	A	1.1

Table 9 – Cessnock Road / Orange Street Signals - Sidra Modelling Results Summary

Model Scenario	Degree of Saturation (v/c)	Worst Average Delay (s)	Worst / Average LoS	95% back of Queue Length (veh.)
2021 AM + development – signals (60 s)	0.848	20.8	B	22.5
2021 PM + development – signals (80 s)	0.900	20.5	B	28.4
2031 AM + development – signals (70 s)	0.901	27.2	B	33.9
2031 PM + development – signals (100 s)	0.891	20.9	B	35.4

(Cycle times in brackets)

Table 10 – Gingers Lane / Subdivision Access Give Way T-intersection - Sidra Modelling Results Summary

Model Scenario	Degree of Saturation (v/c)	Worst Average Delay (s)	Worst LoS	95% back of Queue Length (veh.)
2021 AM	0.121	9.5	A	0.5
2021 PM	0.143	11.0	A	0.4
2031 AM	0.135	10.4	A	0.5
2031 PM	0.166	12.1	A	0.4

This modelling shows that all intersections impacted by this development will continue to operate satisfactorily post development for at least 10 years with average delays, LoS and back of queue lengths all well within the thresholds for satisfactory operation set by TfNSW. Based on this assessment none of the existing intersections will require upgrading to improve the operation of these intersections.

11.3 Road Upgrading

As determined in the previous section the Cessnock Road / Orange Street stop priority controlled T-intersection will need to be upgraded to traffic signals prior to occupation of the proposed residential estate.

A preliminary review of the existing road network would also indicate that Metcalfe Lane will need to be upgraded as development proceeds to ensure a suitable sealed road access is provided to the development as required by Council's Requirements for Development and would be expected to be undertaken as development of the site proceeds.

The suitability of the existing BAR / BAL intersections and the required new subdivision accesses have been assessed based on the turn lane warrants provided in *Figure 3.25 of Austroads Guide to Traffic Management Part 6 – Intersections, Interchanges and Crossings Management (2020).* A summary of the assessments has been provided in ***Table 11*** below. The final schedule of road upgrading's required for the proposed residential development is shown in ***Table 12*** below. It is noted staging of the road upgrading's will be determined within updated traffic assessments at DA stage as the subdivision master planning and staging is known. They will however be programmed as required as the site develops i.e. as soon as the development generates traffic on these impacted road segments the upgrading will be required prior to the release of the Subdivision Certificate for that stage of the development.

Table 11 – Turn Lane Warrants Assessments

Intersection	Current standard	Q_{MR}	Q_R	Q_{ML}	Q_L	Required Standard	Upgrading required
Sawyers Gully Road / Metcalfe Lane	BAR / BAL	550	7	504	46	CHR(S) / AUL	Yes
Frame Drive / Metcalfe Lane	BAR / BAL	227	32	222	5	CHR(S) / BAL	Yes
Frame Drive / Gingers Lane	CHR / BAL	378	228	357	21	CHR / AUL(S)	Yes
Ginger's Lane access	New	544	94	481	63	CHR / AUL	Yes
Western Metcalfe Lane access	New	54	15	31	23	BAR / BAL	Yes
Middle Metcalfe Lane access	New	53	6	44	9	BAR / BAL	Yes
Eastern Metcalfe Lane access	New	10	71	56	15	BAR / BAL	Yes

Table 12 – Schedule of Road Upgrades

No.	Road Upgrading	Timing
1	Frame Drive / Gingers Lane - AUL(s) lane	as required
2	Sawyers Gully Road / Metcalfe Lane - CHR & AUL(s) lanes	as required
3	Frame Drive / Metcalfe Lane - CHR lane	as required
4	Metcalfe Lane sealing	as required
5	New access intersections	as required

11.4 On-site car parking and access

The planning proposal does not itself generate an on-site car parking demand. Future development of the new allotments would generate the on-site car parking demand and assessment of suitable on-site parking provision is required at a future development application stage for the allotments. However as the lot sizes comply with the lot size requirements of Cessnock City Council's DCP it is reasonable to assume there is sufficient areas within each lot to provide suitable off-street car parking for individual dwellings as well as a residential vehicular access crossing for each lot. These matters can also be further reviewed at subdivision development application stage.

The proposed site accesses were inspected and it was found the required safe intersection requirements of Austroads (170 m minimum for 80 km/h) can be achieved at each access but this will need to be confirmed at Construction Certificate stage for each access.

12.0 PEDESTRIAN & CYCLE FACILITIES

The planning proposal will generate pedestrian and cycle traffic therefore a nexus would exist to provide additional facilities. The provision of such facilities would however be up to the future asset owner i.e. Cessnock City Council to determine as future maintenance responsibility would lie with the Council. Provision of such facilities should also consider the fairness and reasonableness of such cost burdens on the developer and other development in the area and will be considered at development application stage within a review of this traffic assessment should the project proceed to this stage. External contribution to pedestrian and cycle facilities should be by way of S7.11 contributions. Internally the development will provide pedestrian and cycle facilities in accordance with Council's engineering standards for subdivisions which would be included within conditions for subdivision consent at a future stage in the development process i.e. development application stage.

13.0 PUBLIC TRANSPORT FACILITIES

The proposed development is likely to generate additional public transport usage albeit this is likely to be minor given the existing service to the area is limited. It is therefore considered that the site could be suitably serviced by public transport through use of and possible extension of the existing service to the area. It is noted that the new residential lots will be more than 400 metres away from the existing bus services / stops on Cessnock Road therefore part of the internal road network within the residential subdivision will need to be constructed to accommodate bus movements to accommodate future demand warrants and the provision of at least a school bus service within the subdivision.

Consideration of bus routes, bus stop locations and the provision of shelters and seats within the subdivision will need to be considered at the development application stage in consultation with the local bus companies and NSW Department of Transport.

14.0 CONCLUSIONS

This traffic impact assessment for a residential planning proposal on 19 separate lots within the Ginger's Lane sub-precinct bordered by Frame Drive, Gingers Lane, Sawyers Gully Road and Metcalfe Lane, Sawyers Gully. has concluded:

- Existing traffic volumes on the adjoining state road network are within the technical mid-block two-way standards determined by Austroads and TfNSW therefore the state road network has capacity to cater for additional traffic associated with new development in the area.
- The planning proposal when fully developed is likely to generate an additional 318 vtph during the AM peak and 337 vtph during the PM peak traffic periods or 2,768 vtpd.
- The adjoining local and state road network with currently has sufficient spare capacity to cater for the traffic generated by this development and other proposed developments in the area without adversely impacting on the efficiency of the adjoining state road network, noting the Cessnock Road / Orange Street stop priority controlled T-intersection at Abermain is to be upgraded to traffic signals by TfNSW within 12 months.
- Sidra modelling has shown all other major intersections on the local road network, including the Gingers Lane / Sawyers Gully Road / Hart Road / Government Road roundabout will continue to operate satisfactorily post development, while the remaining minor intersections will continue to operate with uninterrupted flow conditions.
- Sidra modelling has shown the proposed main Gingers Lane access to the development will operate satisfactorily beyond 2031, while the three minor subdivision accesses to Metcalfe Lane will operate with uninterrupted flow conditions to beyond 2031.
- The planning proposal does not itself generate an on-site car parking demand. Future development of the new allotments would generate the on-site car parking demand and assessment of suitable on-site parking provision is required at a future development application stage for the allotments. It is reasonable to conclude though that as the lots will comply with Cessnock City Council's DCP there will be sufficient room to provide the required on-site car parking and vehicular access for at least a residential dwelling.
- The planning proposal will generate pedestrian and cycle traffic therefore a nexus would exist to provide additional facilities. Consideration of these facilities will be further considered at development application stage should the project proceed to this stage. Internally the development will provide pedestrian and cycle facilities in accordance with Council's engineering requirements for development which would be included within conditions for subdivision consent at a future development application stage.
- The site is likely to generate demand for public transport services particularly regarding school bus services however the site could be easily serviced by public transport as an existing bus route already operates on Cessnock Road which could be diverted along Gingers Lane if demand could be established. This issue can be further considered at development application stage should the development proceed to this stage.
- Turn lane warrant assessments undertaken for new and existing intersections has determined that the new Gingers Lane access should be constructed as a CHR / AUL intersection while the new access intersections on Metcalfe Lane can be constructed as BAR / BAL intersections (minimum standard).
- The proposed site accesses were inspected and it was found the required safe intersection requirements of Austroads (170 m minimum for 80 km/h) can be achieved at each access but this will need to be confirmed at Construction Certificate stage for each access.
- Based on turn lane warrant assessments undertaken and noting existing road conditions the development of the residential estate will also require the sealing of Metcalfe Lane to Cessnock City Council requirements, the addition of an AUL(s) lane to the Gingers Lane /

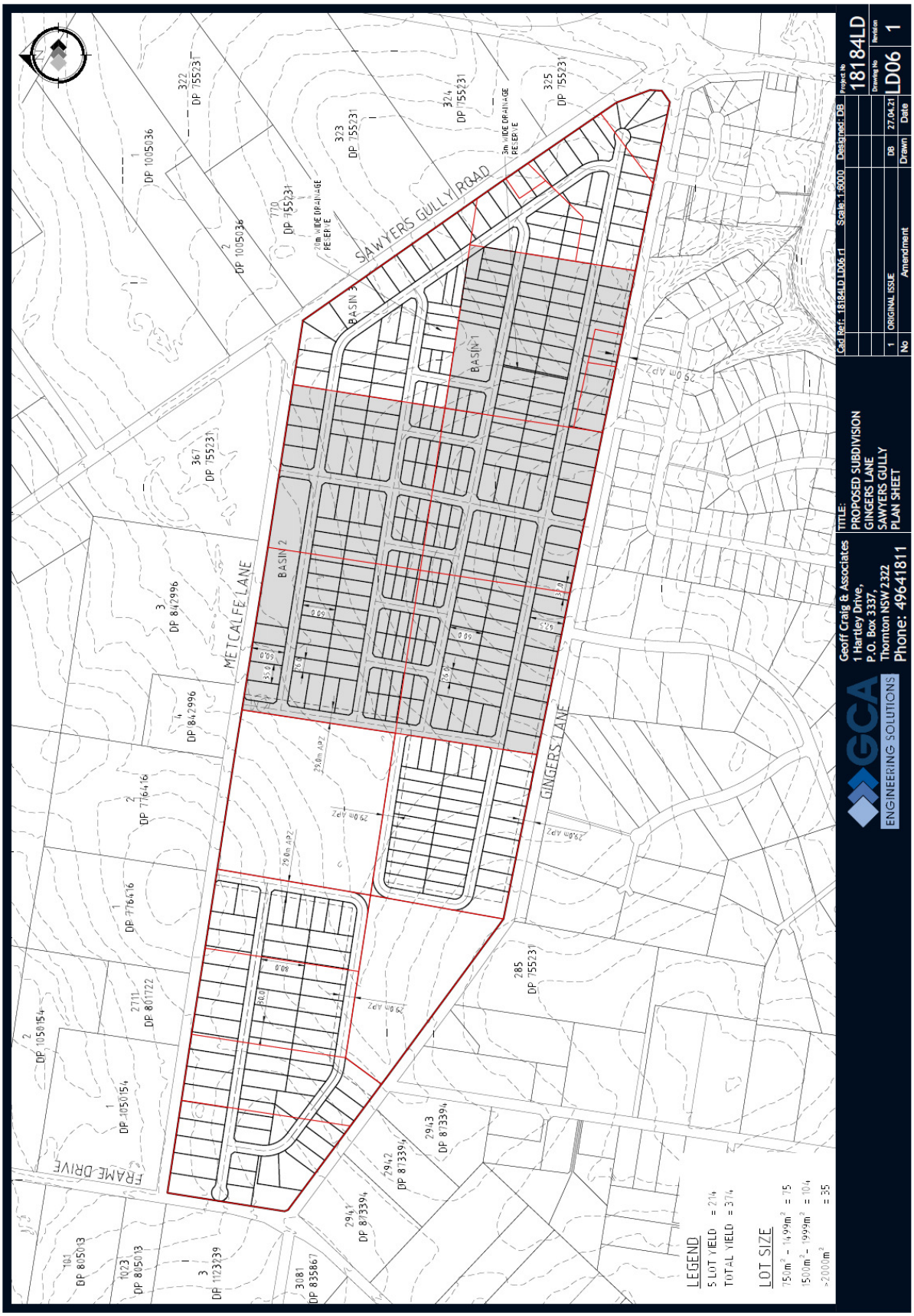
Frame Drive intersection, the addition of a CHR(s) lane to the Frame Drive / Metcalfe Lane intersection as well as the addition of a CHR lane and an AUL(s) lane at the Sawyers Gully Road / Metcalfe Lane intersection. The staging of these works will be determined at DA stage when updated traffic assessments are undertaken and the final masterplan and staging of the development are known. The works will be undertaken as required by the staging and conditioned by Cessnock City Council.

15.0 RECOMMENDATION

Having carried out this traffic impact assessment for a residential planning proposal on 19 separate lots within the Ginger's Lane sub-precinct bordered by Frame Drive, Gingers Lane, Sawyers Gully Road and Metcalfe Lane, Sawyers Gully, it is recommended that the proposal, subject to the works identified in the road upgrading schedule (***Table 12***) being undertaken at appropriate stages, can be supported from a traffic impact perspective as it will not adversely impact on the adjoining state road network and complies with all relevant Cessnock City Council, Austroads, Australian Standards and TfNSW requirements.

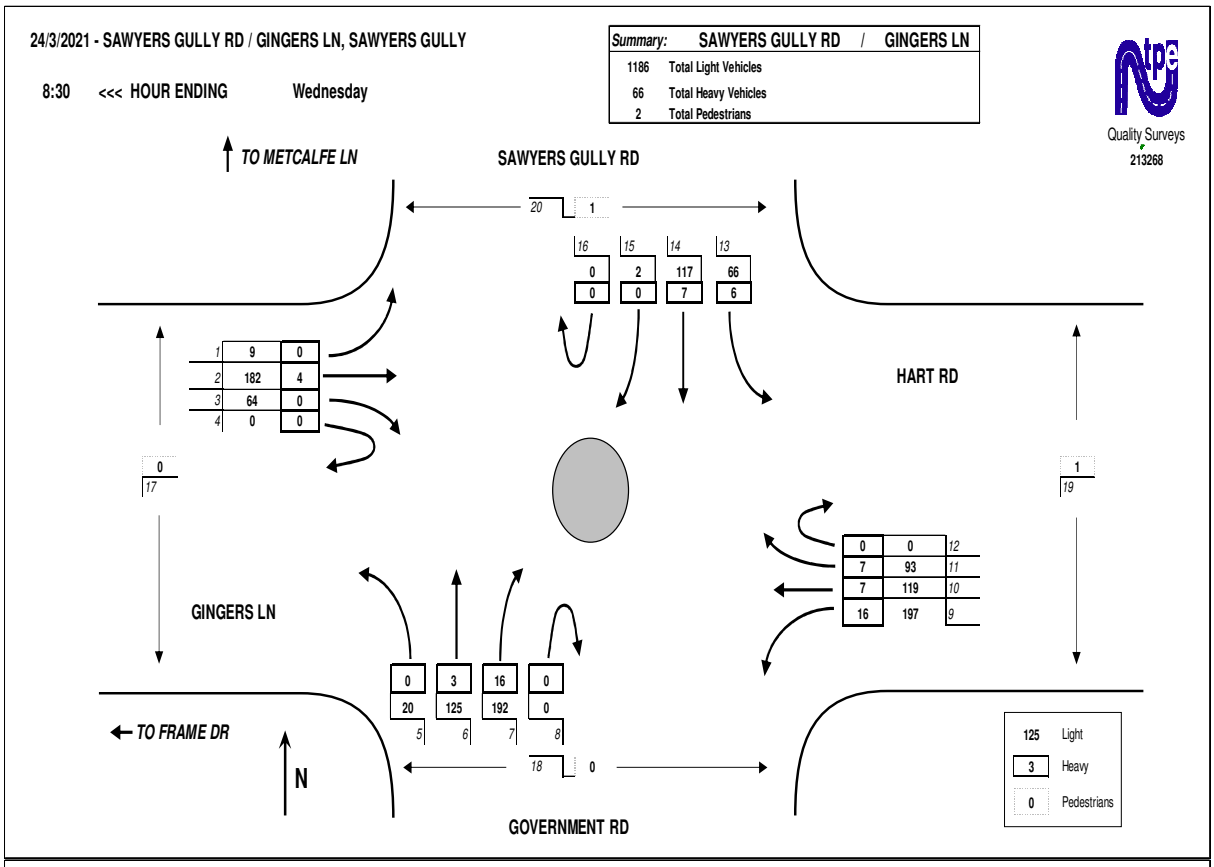
JR Garry BE (Civil), Masters of Traffic
Director
Intersect Traffic Pty Ltd

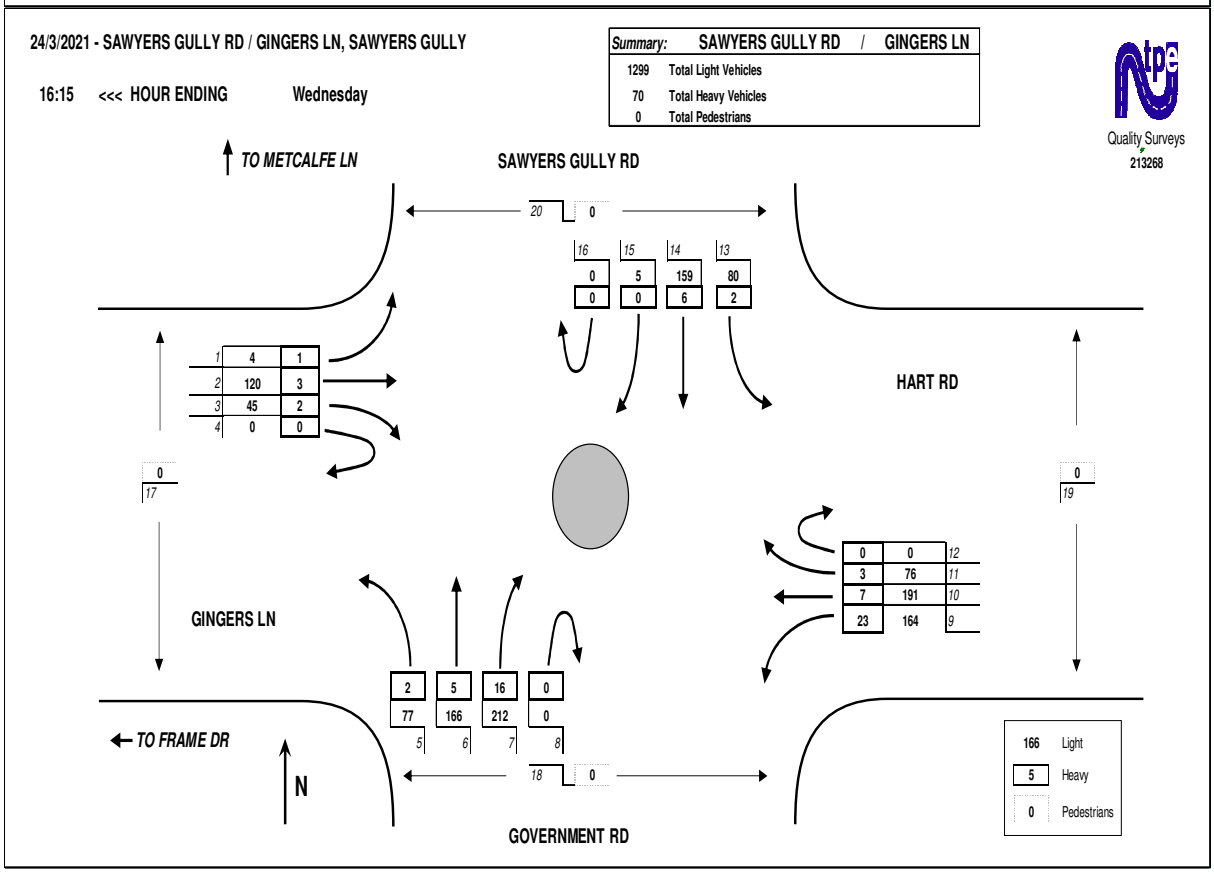
ATTACHMENT A
Development Plans


SAWYERS GULLY ROAD
METCALFE LANE
GINGERS LANE
FRAME DRIVE
BASIN 1
BASIN 2
BASIN 3
LEGEND
5 LOT YIELD = 214
TOTAL YIELD = 374
LOT SIZE
750m² - 1499m² = 175
1500m² - 1999m² = 104
>2000m² = 35
TITLE:
PROPOSED SUBDIVISION
GINGERS LANE
SAWYERS GULLY
PLAN SHEET
Geoff Craig & Associates
1 Hartley Drive,
P.O. Box 3337,
Thornton NSW 2322
Phone: 49641811
GCA
ENGINEERING SOLUTIONS
Cad Ref: 18184LD LD06.r1
Scale: 1:6000
Designed: DB
Project No 18184LD
Drawing No LD06
Revision 1
1 ORIGINAL ISSUE DB 27.04.21
No Amendment Drawn Date

ATTACHMENT B

Traffic Count Data


24/3/2021 - SAWYERS GULLY RD / GINGERS LN, SAWYERS GULLY
8:30 <<< HOUR ENDING Wednesday
Summary: SAWYERS GULLY RD / GINGERS LN
1186 Total Light Vehicles
66 Total Heavy Vehicles
2 Total Pedestrians
Quality Surveys
213268
TO METCALFE LN
SAWYERS GULLY RD
HART RD
GINGERS LN
TO FRAME DR
GOVERNMENT RD
N
125 Light
3 Heavy
0 Pedestrians

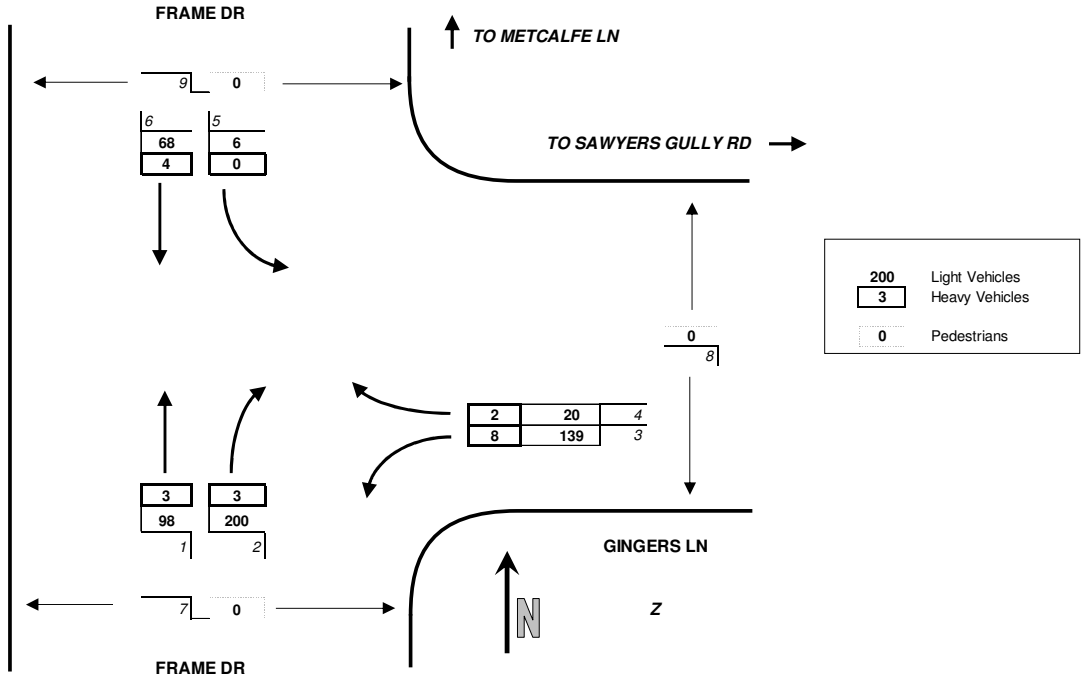

24/3/2021 - SAWYERS GULLY RD / GINGERS LN, SAWYERS GULLY
16:15 <<< HOUR ENDING Wednesday
Summary: SAWYERS GULLY RD / GINGERS LN
1299 Total Light Vehicles
70 Total Heavy Vehicles
0 Total Pedestrians
Quality Surveys
213268
TO METCALFE LN
SAWYERS GULLY RD
HART RD
GINGERS LN
TO FRAME DR
GOVERNMENT RD
N
166 Light
5 Heavy
0 Pedestrians

24/3/2021 - FRAME DR / GINGERS LN, SAWYERS GULLY

8:15 <<< HOUR ENDING **Wednesday**

Summary:	FRAME DR / GINGERS LN
531	Total Light Vehicles
20	Total Heavy Vehicles
0	Total Pedestrians

Quality Surveys 213268

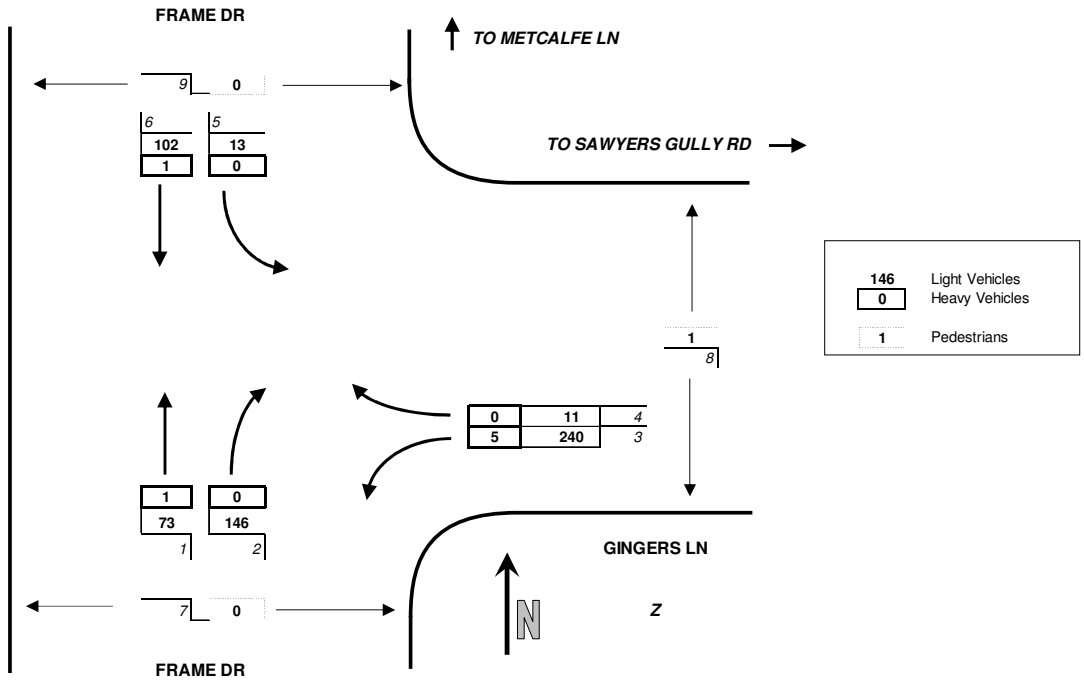


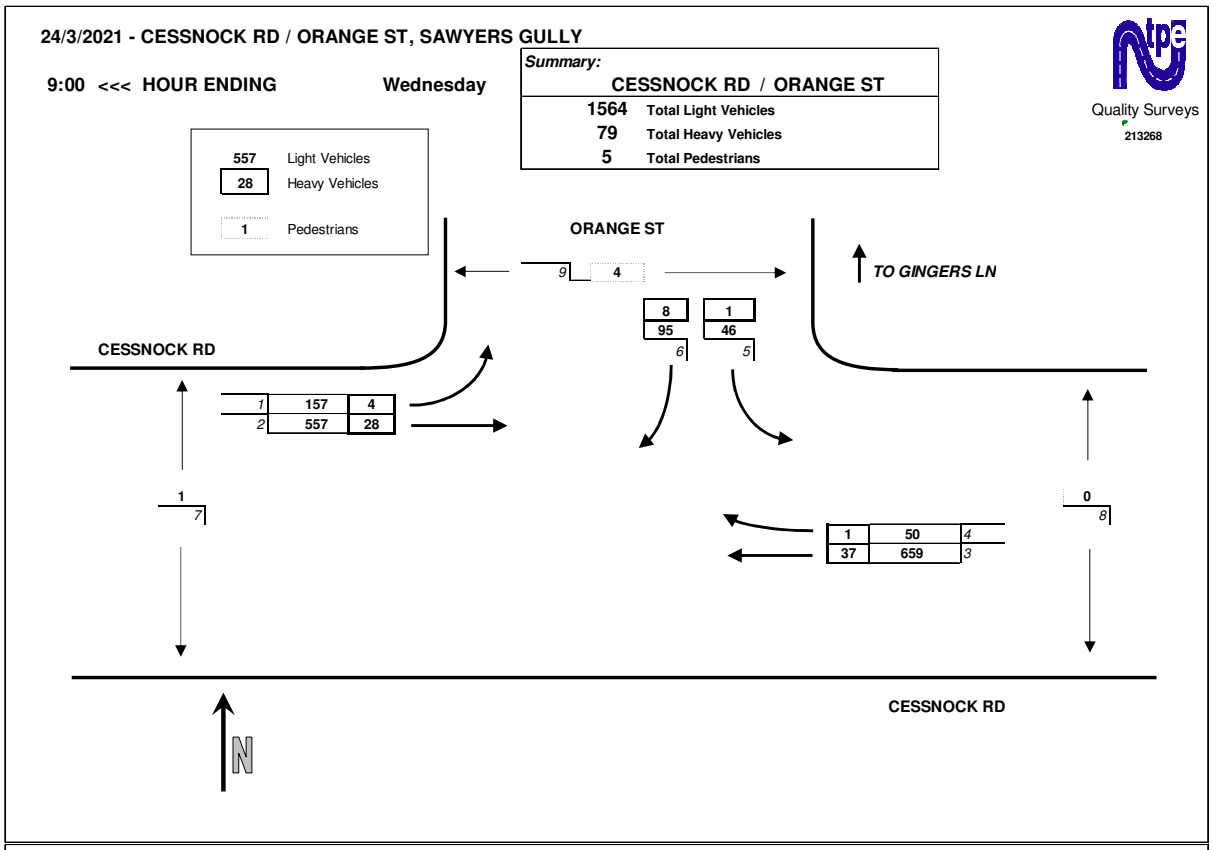
24/3/2021 - FRAME DR / GINGERS LN, SAWYERS GULLY

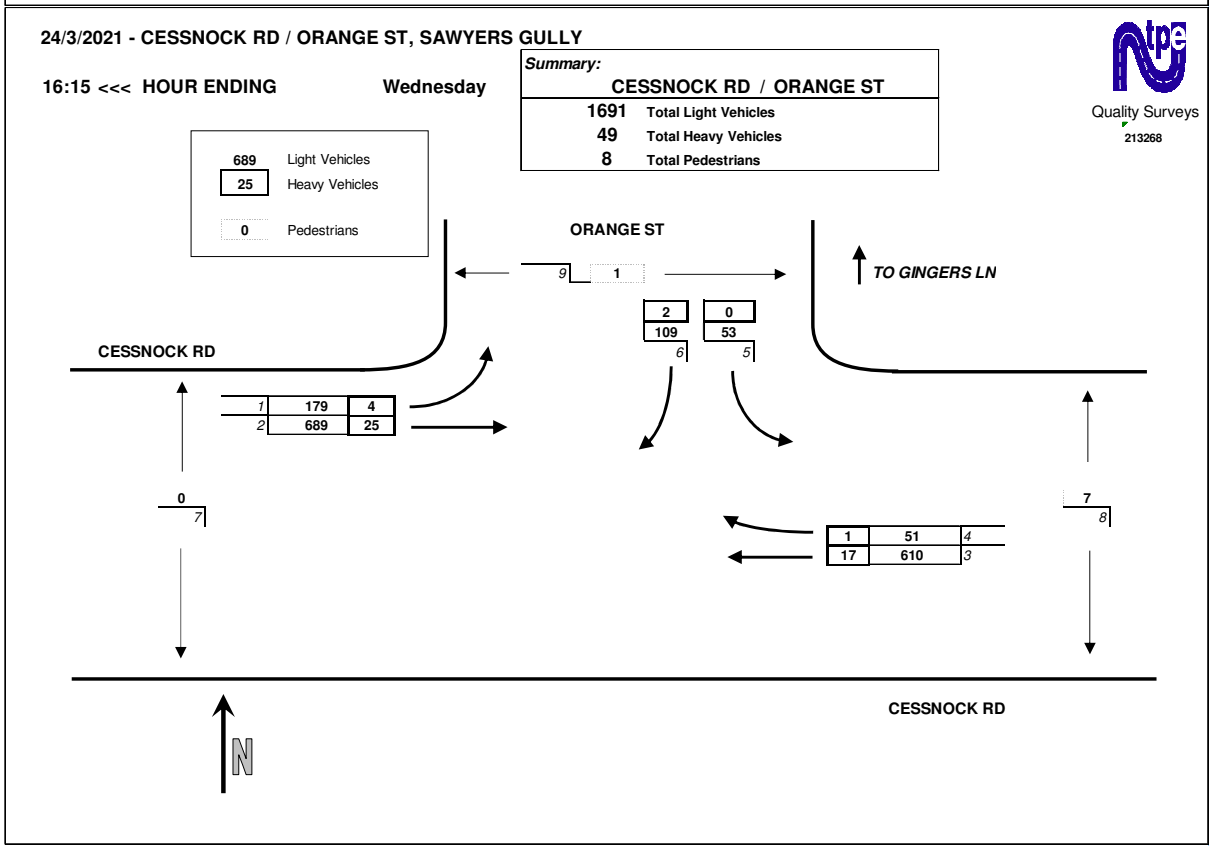
17:45 <<< HOUR ENDING **Wednesday**

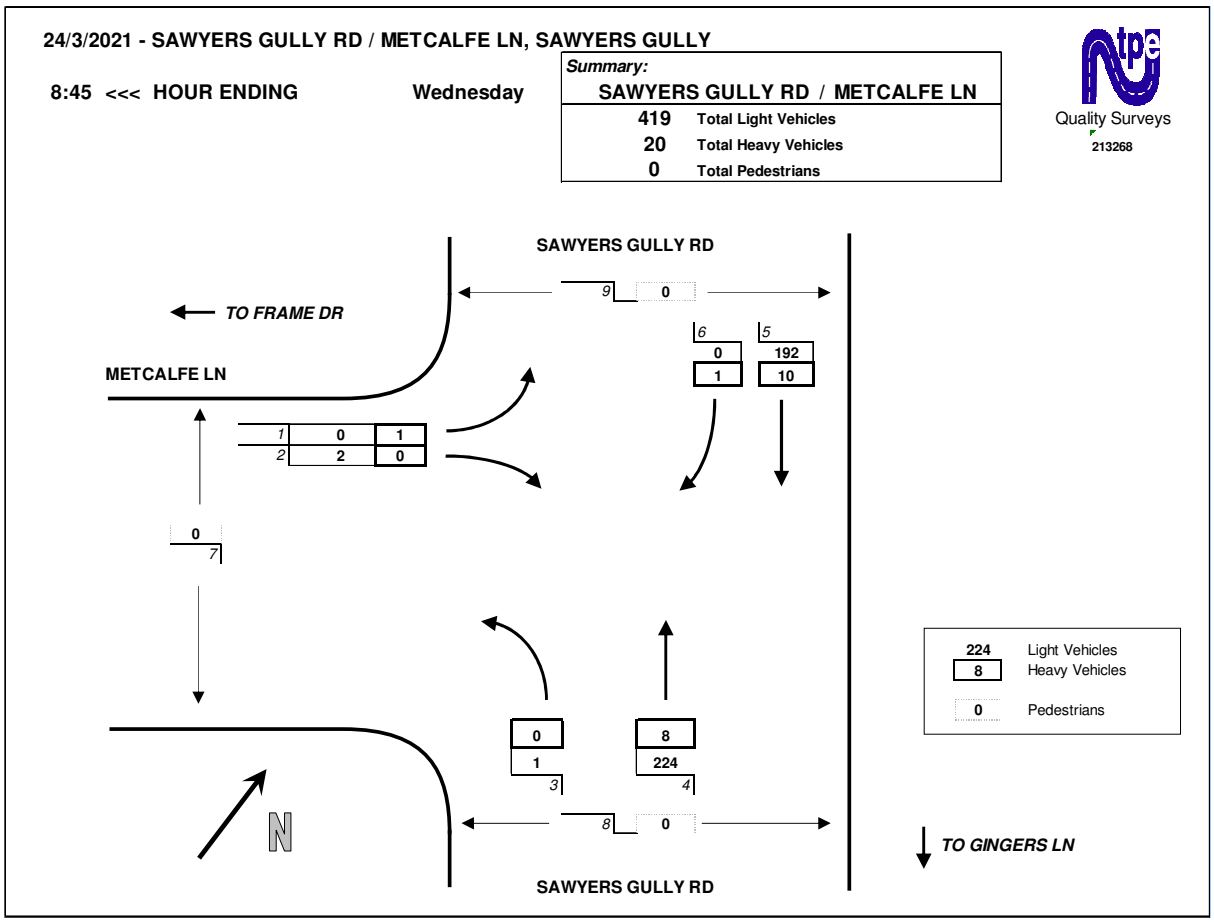
Summary:	FRAME DR / GINGERS LN
585	Total Light Vehicles
7	Total Heavy Vehicles
1	Total Pedestrians

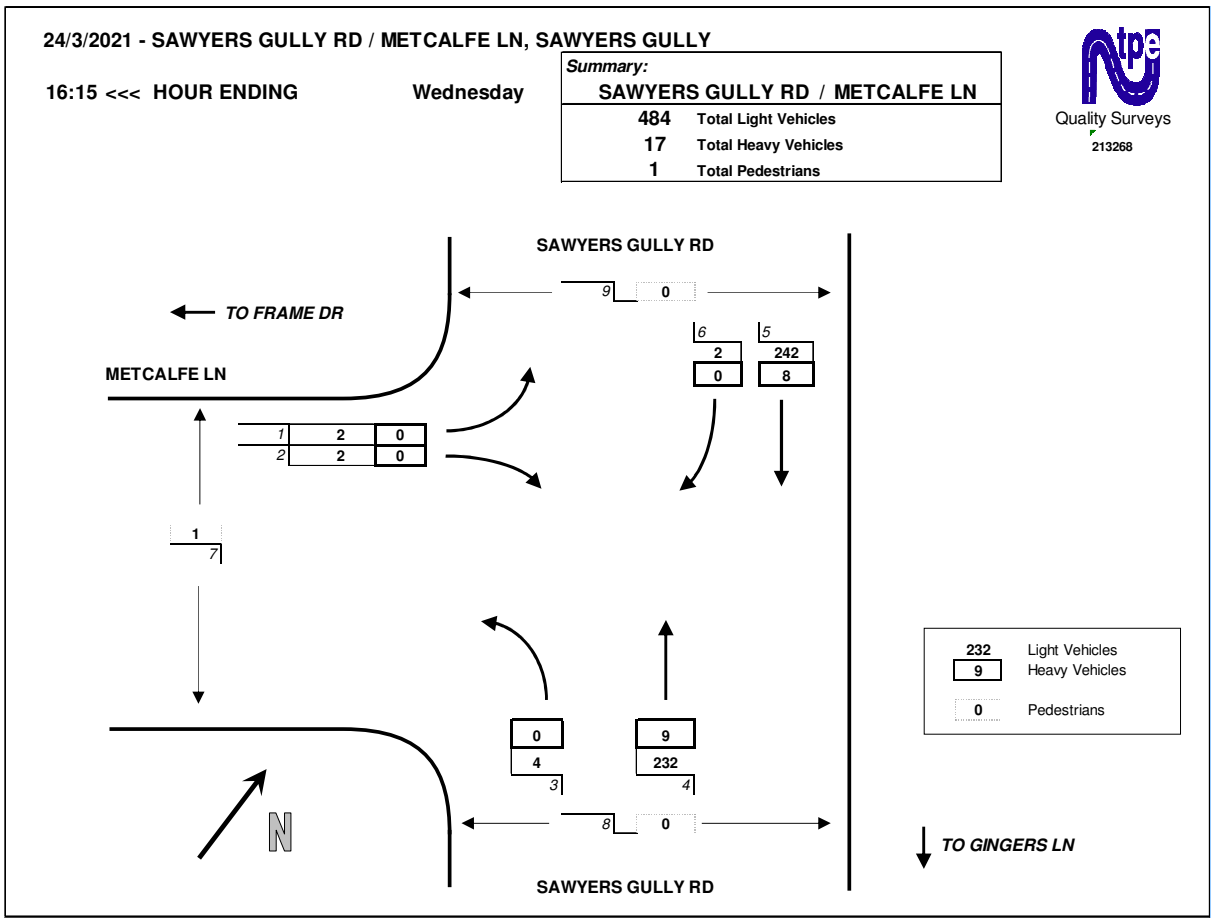
Quality Surveys 213268




24/3/2021 - CESSNOCK RD / ORANGE ST, SAWYERS GULLY
9:00 <<< HOUR ENDING
Wednesday
Summary:
CESSNOCK RD / ORANGE ST
1564 Total Light Vehicles
79 Total Heavy Vehicles
5 Total Pedestrians
Quality Surveys
213268
557 Light Vehicles
28 Heavy Vehicles
1 Pedestrians
ORANGE ST
TO GINGERS LN
CESSNOCK RD
CESSNOCK RD
N


24/3/2021 - CESSNOCK RD / ORANGE ST, SAWYERS GULLY
16:15 <<< HOUR ENDING
Wednesday
Summary:
CESSNOCK RD / ORANGE ST
1691 Total Light Vehicles
49 Total Heavy Vehicles
8 Total Pedestrians
Quality Surveys
213268
689 Light Vehicles
25 Heavy Vehicles
0 Pedestrians
ORANGE ST
TO GINGERS LN
CESSNOCK RD
CESSNOCK RD
N


24/3/2021 - SAWYERS GULLY RD / METCALFE LN, SAWYERS GULLY
8:45 <<< HOUR ENDING
Wednesday
Summary:
SAWYERS GULLY RD / METCALFE LN
419 Total Light Vehicles
20 Total Heavy Vehicles
0 Total Pedestrians
Quality Surveys
213268
SAWYERS GULLY RD
TO FRAME DR
METCALFE LN
9 0
6 0 1
5 192 10
1 0 1
2 2 0
0 7
0 1 3
8 224 4
8 0
SAWYERS GULLY RD
N
224 Light Vehicles
8 Heavy Vehicles
0 Pedestrians
TO GINGERS LN

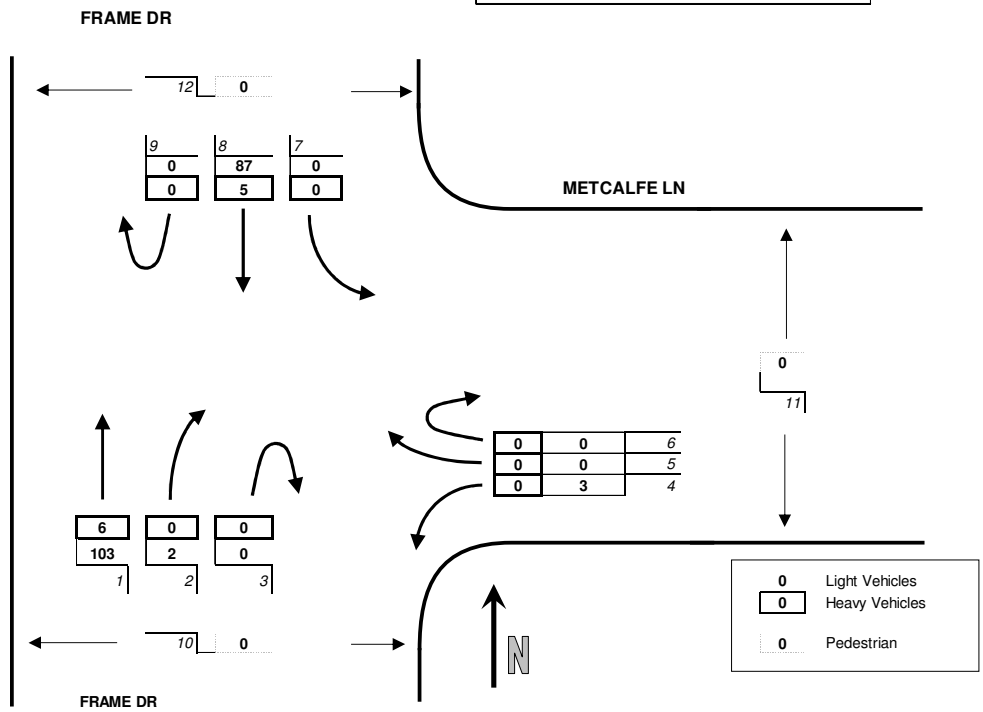

24/3/2021 - SAWYERS GULLY RD / METCALFE LN, SAWYERS GULLY
16:15 <<< HOUR ENDING
Wednesday
Summary:
SAWYERS GULLY RD / METCALFE LN
484 Total Light Vehicles
17 Total Heavy Vehicles
1 Total Pedestrians
Quality Surveys
213268
SAWYERS GULLY RD
TO FRAME DR
METCALFE LN
9 0
6 2 0
5 242 8
1 2 0
2 2 0
1 7
0 4 3
9 232 4
8 0
SAWYERS GULLY RD
N
232 Light Vehicles
9 Heavy Vehicles
0 Pedestrians
TO GINGERS LN

24/3/2021 - FRAME DR / METCALFE LN, SAWYERS GULLY

8:30 <<< HOUR ENDING **Wednesday**

Summary: FRAME DR / METCALFE LN	
195	Total Light Vehicles
11	Total Heavy Vehicles
0	Total Pedestrians

Quality Surveys 213268

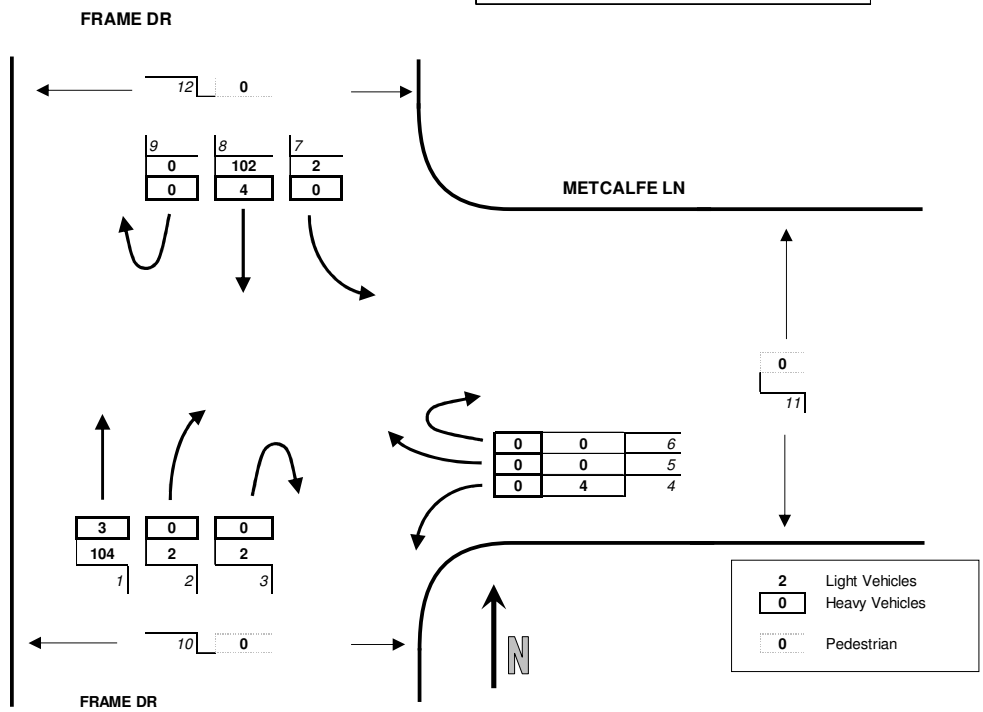


24/3/2021 - FRAME DR / METCALFE LN, SAWYERS GULLY

16:00 <<< HOUR ENDING **Wednesday**

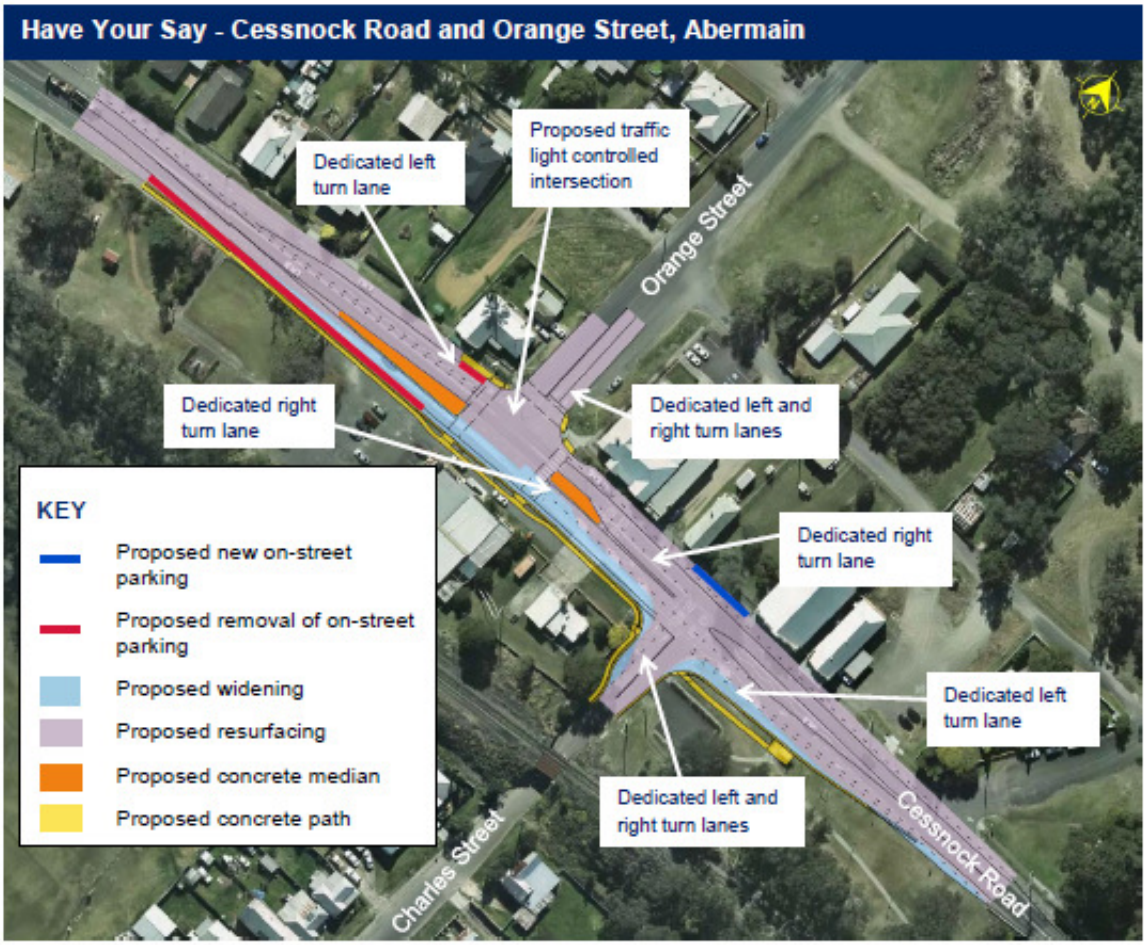
Summary: FRAME DR / METCALFE LN	
216	Total Light Vehicles
7	Total Heavy Vehicles
0	Total Pedestrians

Quality Surveys 213268



ATTACHMENT C

Cessnock Road / Orange Street traffic signals


Have Your Say - Cessnock Road and Orange Street, Abermain
Dedicated left turn lane
Proposed traffic light controlled intersection
Orange Street
Dedicated right turn lane
Dedicated left and right turn lanes
KEY
Proposed new on-street parking
Proposed removal of on-street parking
Proposed widening
Proposed resurfacing
Proposed concrete median
Proposed concrete path
Dedicated right turn lane
Dedicated left turn lane
Dedicated left and right turn lanes
Charles Street
Cessnock Road

ATTACHMENT D

SIDRA Movement Summary Tables

MOVEMENT SUMMARY

Site: 101 [2021AM - + development (Site Folder: General)]

Sawyers Gully Rd / Gingers Ln / Hart Rd / Government Rd roundabout
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Government Road														
1	L2	24	0	25	0.0	0.370	5.7	LOS A	2.5	18.4	0.57	0.68	0.57	51.6
2	T1	130	3	137	2.3	0.370	5.9	LOS A	2.5	18.4	0.57	0.68	0.57	52.7
3	R2	208	16	219	7.7	0.370	10.6	LOS A	2.5	18.4	0.57	0.68	0.57	52.4
Approach		362	19	381	5.2	0.370	8.6	LOS A	2.5	18.4	0.57	0.68	0.57	52.4
East: Hart Road														
4	L2	213	16	224	7.5	0.446	5.7	LOS A	3.3	24.2	0.56	0.63	0.56	52.5
5	T1	145	7	153	4.8	0.446	5.8	LOS A	3.3	24.2	0.56	0.63	0.56	53.8
6	R2	109	7	115	6.4	0.446	10.4	LOS A	3.3	24.2	0.56	0.63	0.56	53.5
Approach		467	30	492	6.4	0.446	6.8	LOS A	3.3	24.2	0.56	0.63	0.56	53.1
North: Sawyers Gully Road														
7	L2	108	6	114	5.6	0.328	8.0	LOS A	2.1	15.6	0.74	0.78	0.74	51.9
8	T1	133	7	140	5.3	0.328	8.1	LOS A	2.1	15.6	0.74	0.78	0.74	53.2
9	R2	5	0	5	0.0	0.328	12.5	LOS A	2.1	15.6	0.74	0.78	0.74	53.2
Approach		246	13	259	5.3	0.328	8.2	LOS A	2.1	15.6	0.74	0.78	0.74	52.6
West: Gingers Lane														
10	L2	19	0	20	0.0	0.426	7.3	LOS A	2.9	20.8	0.72	0.76	0.72	51.6
11	T1	263	4	277	1.5	0.426	7.5	LOS A	2.9	20.8	0.72	0.76	0.72	52.7
12	R2	79	0	83	0.0	0.426	12.0	LOS A	2.9	20.8	0.72	0.76	0.72	52.7
Approach		361	4	380	1.1	0.426	8.5	LOS A	2.9	20.8	0.72	0.76	0.72	52.6
All Vehicles		1436	66	1512	4.6	0.446	7.9	LOS A	3.3	24.2	0.64	0.70	0.64	52.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 10:39:31 AM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Gingers_Sawyers_Hart.sip9

MOVEMENT SUMMARY

Site: 101 [2021PM + development (Site Folder: General)]

Sawyers Gully Rd / Gingers Ln / Hart Rd / Government Rd roundabout
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Government Road														
1	L2	93	2	98	2.2	0.583	8.4	LOS A	5.4	39.5	0.80	0.86	0.91	50.4
2	T1	179	5	188	2.8	0.583	8.6	LOS A	5.4	39.5	0.80	0.86	0.91	51.5
3	R2	228	16	240	7.0	0.583	13.3	LOS A	5.4	39.5	0.80	0.86	0.91	51.2
Approach		500	23	526	4.6	0.583	10.7	LOS A	5.4	39.5	0.80	0.86	0.91	51.2
East: Hart Road														
4	L2	187	23	197	12.3	0.550	6.2	LOS A	4.5	33.2	0.65	0.66	0.65	52.0
5	T1	269	7	283	2.6	0.550	6.1	LOS A	4.5	33.2	0.65	0.66	0.65	53.4
6	R2	113	3	119	2.7	0.550	10.6	LOS A	4.5	33.2	0.65	0.66	0.65	53.3
Approach		569	33	599	5.8	0.550	7.0	LOS A	4.5	33.2	0.65	0.66	0.65	52.9
North: Sawyers Gully Road														
7	L2	95	2	100	2.1	0.327	6.9	LOS A	2.1	15.1	0.67	0.71	0.67	52.4
8	T1	169	6	178	3.6	0.327	7.2	LOS A	2.1	15.1	0.67	0.71	0.67	53.6
9	R2	14	0	15	0.0	0.327	11.6	LOS A	2.1	15.1	0.67	0.71	0.67	53.6
Approach		278	8	293	2.9	0.327	7.3	LOS A	2.1	15.1	0.67	0.71	0.67	53.2
West: Gingers Lane														
10	L2	9	1	9	11.1	0.284	7.8	LOS A	1.9	13.4	0.73	0.76	0.73	51.2
11	T1	154	3	162	1.9	0.284	7.6	LOS A	1.9	13.4	0.73	0.76	0.73	52.6
12	R2	53	2	56	3.8	0.284	12.2	LOS A	1.9	13.4	0.73	0.76	0.73	52.4
Approach		216	6	227	2.8	0.284	8.8	LOS A	1.9	13.4	0.73	0.76	0.73	52.5
All Vehicles		1563	70	1645	4.5	0.583	8.5	LOS A	5.4	39.5	0.71	0.75	0.75	52.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 11:03:49 AM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Gingers_Sawyers_Hart.sip9

MOVEMENT SUMMARY

Site: 101 [2031AM + development (Site Folder: General)]

Sawyers Gully Rd / Gingers Ln / Hart Rd / Government Rd roundabout
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Government Road														
1	L2	27	0	28	0.0	0.441	6.0	LOS A	3.2	23.4	0.64	0.71	0.64	51.4
2	T1	154	3	162	1.9	0.441	6.3	LOS A	3.2	23.4	0.64	0.71	0.64	52.5
3	R2	241	16	254	6.6	0.441	10.9	LOS A	3.2	23.4	0.64	0.71	0.64	52.2
Approach		422	19	444	4.5	0.441	8.9	LOS A	3.2	23.4	0.64	0.71	0.64	52.2
East: Hart Road														
4	L2	247	16	260	6.5	0.516	6.0	LOS A	4.1	29.9	0.63	0.66	0.63	52.2
5	T1	156	7	164	4.5	0.516	6.1	LOS A	4.1	29.9	0.63	0.66	0.63	53.5
6	R2	125	7	132	5.6	0.516	10.7	LOS A	4.1	29.9	0.63	0.66	0.63	53.3
Approach		528	30	556	5.7	0.516	7.2	LOS A	4.1	29.9	0.63	0.66	0.63	52.9
North: Sawyers Gully Road														
7	L2	120	6	126	5.0	0.396	8.9	LOS A	2.7	19.9	0.81	0.84	0.81	51.4
8	T1	149	7	157	4.7	0.396	9.0	LOS A	2.7	19.9	0.81	0.84	0.81	52.6
9	R2	5	0	5	0.0	0.396	13.3	LOS A	2.7	19.9	0.81	0.84	0.81	52.6
Approach		274	13	288	4.7	0.396	9.0	LOS A	2.7	19.9	0.81	0.84	0.81	52.1
West: Gingers Lane														
10	L2	20	0	21	0.0	0.511	9.0	LOS A	4.2	29.8	0.81	0.87	0.91	50.8
11	T1	293	4	308	1.4	0.511	9.3	LOS A	4.2	29.8	0.81	0.87	0.91	51.8
12	R2	89	0	94	0.0	0.511	13.7	LOS A	4.2	29.8	0.81	0.87	0.91	51.8
Approach		402	4	423	1.0	0.511	10.2	LOS A	4.2	29.8	0.81	0.87	0.91	51.8
All Vehicles		1626	66	1712	4.1	0.516	8.7	LOS A	4.2	29.9	0.71	0.76	0.73	52.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 10:44:54 AM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Gingers_Sawyers_Hart.sip9

MOVEMENT SUMMARY

Site: 101 [2031PM + development (Site Folder: General)]

Sawyers Gully Rd / Gingers Ln / Hart Rd / Government Rd roundabout
Site Category: (None)
Roundabout

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Government Road														
1	L2	106	2	112	1.9	0.712	11.6	LOS A	8.7	63.2	0.93	1.01	1.21	48.4
2	T1	206	5	217	2.4	0.712	11.8	LOS A	8.7	63.2	0.93	1.01	1.21	49.4
3	R2	265	16	279	6.0	0.712	16.5	LOS B	8.7	63.2	0.93	1.01	1.21	49.1
Approach		577	23	607	4.0	0.712	13.9	LOS A	8.7	63.2	0.93	1.01	1.21	49.1
East: Hart Road														
4	L2	217	23	228	10.6	0.644	7.6	LOS A	6.6	48.4	0.76	0.75	0.82	51.4
5	T1	301	7	317	2.3	0.644	7.5	LOS A	6.6	48.4	0.76	0.75	0.82	52.8
6	R2	126	3	133	2.4	0.644	12.0	LOS A	6.6	48.4	0.76	0.75	0.82	52.7
Approach		644	33	678	5.1	0.644	8.4	LOS A	6.6	48.4	0.76	0.75	0.82	52.3
North: Sawyers Gully Road														
7	L2	110	2	116	1.8	0.404	7.7	LOS A	2.8	19.8	0.75	0.78	0.75	52.0
8	T1	195	6	205	3.1	0.404	7.9	LOS A	2.8	19.8	0.75	0.78	0.75	53.2
9	R2	15	0	16	0.0	0.404	12.3	LOS A	2.8	19.8	0.75	0.78	0.75	53.1
Approach		320	8	337	2.5	0.404	8.0	LOS A	2.8	19.8	0.75	0.78	0.75	52.8
West: Gingers Lane														
10	L2	10	1	11	10.0	0.359	8.7	LOS A	2.5	18.1	0.82	0.83	0.82	50.8
11	T1	174	3	183	1.7	0.359	8.5	LOS A	2.5	18.1	0.82	0.83	0.82	52.1
12	R2	61	2	64	3.3	0.359	13.1	LOS A	2.5	18.1	0.82	0.83	0.82	52.0
Approach		245	6	258	2.4	0.359	9.6	LOS A	2.5	18.1	0.82	0.83	0.82	52.0
All Vehicles		1786	70	1880	3.9	0.712	10.3	LOS A	8.7	63.2	0.82	0.85	0.94	51.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 11:00:43 AM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Gingers_Sawyers_Hart.sip9

MOVEMENT SUMMARY

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

Frame Drive / Gingers Lane CHR/BAL give way
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Frame Drive														
2	T1	109	3	115	2.8	0.060	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
3	R2	218	3	229	1.4	0.143	7.2	LOS A	0.7	5.0	0.25	0.59	0.25	63.8
Approach		327	6	344	1.8	0.143	4.8	NA	0.7	5.0	0.16	0.40	0.16	68.4
East: Gingers Lane														
4	L2	208	8	219	3.8	0.150	7.4	LOS A	0.7	4.8	0.22	0.59	0.22	63.1
6	R2	29	2	31	6.9	0.037	9.3	LOS A	0.2	1.1	0.50	0.69	0.50	60.2
Approach		237	10	249	4.2	0.150	7.6	LOS A	0.7	4.8	0.26	0.61	0.26	62.7
North: Frame Drive														
7	L2	8	0	8	0.0	0.062	7.0	LOS A	0.0	0.0	0.00	0.05	0.00	73.9
8	T1	104	4	109	3.8	0.062	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	79.1
Approach		112	4	118	3.6	0.062	0.5	NA	0.0	0.0	0.00	0.05	0.00	78.7
All Vehicles		676	20	712	3.0	0.150	5.1	NA	0.7	5.0	0.17	0.41	0.17	67.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 5:34:38 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Frame_Gingers\Frame_gingers.sip9

MOVEMENT SUMMARY

Site: 101 [2021PM + development (Site Folder: General)]

Frame Drive / Gingers Lane CHR/BAL give way
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Frame Drive														
2	T1	102	1	107	1.0	0.056	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
3	R2	203	0	214	0.0	0.134	7.3	LOS A	0.7	4.6	0.27	0.60	0.27	64.1
Approach		305	1	321	0.3	0.134	4.8	NA	0.7	4.6	0.18	0.40	0.18	68.7
East: Gingers Lane														
4	L2	269	5	283	1.9	0.194	7.4	LOS A	0.9	6.3	0.24	0.60	0.24	63.6
6	R2	14	0	15	0.0	0.017	8.8	LOS A	0.1	0.5	0.48	0.66	0.48	62.8
Approach		283	5	298	1.8	0.194	7.5	LOS A	0.9	6.3	0.25	0.60	0.25	63.6
North: Frame Drive														
7	L2	19	0	20	0.0	0.073	7.0	LOS A	0.0	0.0	0.00	0.09	0.00	73.1
8	T1	115	1	121	0.9	0.073	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	78.3
Approach		134	1	141	0.7	0.073	1.0	NA	0.0	0.0	0.00	0.09	0.00	77.5
All Vehicles		722	7	760	1.0	0.194	5.2	NA	0.9	6.3	0.17	0.42	0.17	68.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

MOVEMENT SUMMARY

Site: 101 [2031AM + development (Site Folder: General)]

Frame Drive / Gingers Lane CHR/BAL give way
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Frame Drive														
2	T1	125	3	132	2.4	0.069	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
3	R2	251	3	264	1.2	0.166	7.3	LOS A	0.8	5.9	0.27	0.60	0.27	63.7
Approach		376	6	396	1.6	0.166	4.9	NA	0.8	5.9	0.18	0.40	0.18	68.3
East: Gingers Lane														
4	L2	232	8	244	3.4	0.169	7.4	LOS A	0.8	5.4	0.24	0.60	0.24	63.1
6	R2	33	2	35	6.1	0.045	9.7	LOS A	0.2	1.3	0.53	0.72	0.53	60.0
Approach		265	10	279	3.8	0.169	7.7	LOS A	0.8	5.4	0.28	0.61	0.28	62.7
North: Frame Drive														
7	L2	9	0	9	0.0	0.069	7.0	LOS A	0.0	0.0	0.00	0.05	0.00	73.9
8	T1	116	4	122	3.4	0.069	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	79.1
Approach		125	4	132	3.2	0.069	0.5	NA	0.0	0.0	0.00	0.05	0.00	78.7
All Vehicles		766	20	806	2.6	0.169	5.1	NA	0.8	5.9	0.18	0.42	0.18	67.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 5:39:06 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Frame_Gingers\Frame_gingers.sip9

MOVEMENT SUMMARY

Site: 101 [2031PM + development (Site Folder: General)]

Frame Drive / Gingers Lane CHR/BAL give way
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Frame Drive														
2	T1	114	1	120	0.9	0.062	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
3	R2	226	0	238	0.0	0.152	7.4	LOS A	0.7	5.2	0.29	0.60	0.29	64.0
Approach		340	1	358	0.3	0.152	4.9	NA	0.7	5.2	0.19	0.40	0.19	68.6
East: Gingers Lane														
4	L2	308	5	324	1.6	0.225	7.5	LOS A	1.1	7.5	0.27	0.60	0.27	63.6
6	R2	16	0	17	0.0	0.020	9.2	LOS A	0.1	0.6	0.51	0.68	0.51	62.4
Approach		324	5	341	1.5	0.225	7.6	LOS A	1.1	7.5	0.28	0.61	0.28	63.5
North: Frame Drive														
7	L2	21	0	22	0.0	0.084	7.0	LOS A	0.0	0.0	0.00	0.09	0.00	73.2
8	T1	132	1	139	0.8	0.084	0.0	LOS A	0.0	0.0	0.00	0.09	0.00	78.3
Approach		153	1	161	0.7	0.084	1.0	NA	0.0	0.0	0.00	0.09	0.00	77.6
All Vehicles		817	7	860	0.9	0.225	5.2	NA	1.1	7.5	0.19	0.43	0.19	67.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 5:47:12 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Frame_Gingers\Frame_gingers.sip9

MOVEMENT SUMMARY

Site: 101v [2021 AM + development - Conversion (Site Folder: General)]

Cessnock Road / Orange Street Abermain
Stop priority controlled
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 60 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Cessnock Road														
5	T1	696	37	733	5.3	* 0.848	21.5	LOS B	22.5	164.8	0.91	0.96	1.12	44.3
6	R2	59	1	62	1.7	* 0.151	17.2	LOS B	1.2	8.2	0.73	0.73	0.73	45.5
Approach		755	38	795	5.0	0.848	21.2	LOS B	22.5	164.8	0.90	0.95	1.08	44.4
North: Orange Street														
7	L2	79	1	83	1.3	0.143	21.6	LOS B	1.8	12.5	0.75	0.73	0.75	43.4
9	R2	162	8	171	4.9	* 0.815	39.5	LOS C	5.7	41.7	1.00	0.96	1.41	35.6
Approach		241	9	254	3.7	0.815	33.6	LOS C	5.7	41.7	0.92	0.88	1.19	37.8
West: Cessnock Road														
10	L2	176	4	185	2.3	0.145	8.8	LOS A	1.8	12.8	0.35	0.67	0.35	51.1
11	T1	585	28	616	4.8	0.819	18.8	LOS B	16.8	122.8	0.82	0.85	1.00	45.9
Approach		761	32	801	4.2	0.819	16.5	LOS B	16.8	122.8	0.71	0.81	0.85	47.0
All Vehicles		1757	79	1849	4.5	0.848	20.8	LOS B	22.5	164.8	0.82	0.88	1.00	44.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 27 May 2021 4:23:58 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Cessnock_Orange\Cessnock_Orange.sip9

MOVEMENT SUMMARY

Site: 101v [2021 PM + development - Conversion (Site Folder: General)]

Cessnock Road / Orange Street Abermain
Stop priority controlled
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 80 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Cessnock Road														
5	T1	627	17	660	2.7	0.621	9.8	LOS A	15.1	108.5	0.64	0.57	0.64	51.7
6	R2	82	1	86	1.2	* 0.254	18.8	LOS B	2.1	14.8	0.69	0.75	0.69	44.6
Approach		709	18	746	2.5	0.621	10.8	LOS A	15.1	108.5	0.64	0.59	0.64	50.7
North: Orange Street														
7	L2	66	0	69	0.0	0.158	31.9	LOS C	2.2	15.3	0.83	0.74	0.83	38.7
9	R2	134	2	141	1.5	* 0.877	54.3	LOS D	6.5	45.9	1.00	1.00	1.54	31.1
Approach		200	2	211	1.0	0.877	46.9	LOS D	6.5	45.9	0.94	0.91	1.30	33.3
West: Cessnock Road														
10	L2	338	4	356	1.2	0.249	8.2	LOS A	3.8	27.0	0.30	0.66	0.30	51.6
11	T1	714	25	752	3.5	* 0.900	28.5	LOS B	28.4	205.0	0.69	0.84	0.97	40.9
Approach		1052	29	1107	2.8	0.900	22.0	LOS B	28.4	205.0	0.57	0.79	0.75	43.8
All Vehicles		1961	49	2064	2.5	0.900	20.5	LOS B	28.4	205.0	0.63	0.73	0.77	44.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 27 May 2021 4:24:00 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Cessnock_Orange\Cessnock_Orange.sip9

MOVEMENT SUMMARY

Site: 101v [2031 AM + development - Conversion (Site Folder: General)]

Cessnock Road / Orange Street Abermain
Stop priority controlled
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 70 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Cessnock Road														
5	T1	808	37	851	4.6	* 0.901	29.5	LOS C	33.9	246.5	0.92	1.06	1.20	40.4
6	R2	67	1	71	1.5	* 0.199	20.4	LOS B	1.6	11.6	0.75	0.74	0.75	43.8
Approach		875	38	921	4.3	0.901	28.8	LOS C	33.9	246.5	0.91	1.04	1.17	40.6
North: Orange Street														
7	L2	87	1	92	1.1	0.166	25.2	LOS B	2.3	16.5	0.77	0.74	0.77	41.6
9	R2	179	8	188	4.5	* 0.814	43.7	LOS D	7.2	52.4	1.00	0.94	1.34	34.2
Approach		266	9	280	3.4	0.814	37.7	LOS C	7.2	52.4	0.93	0.88	1.15	36.3
West: Cessnock Road														
10	L2	202	4	213	2.0	0.156	8.3	LOS A	2.1	14.9	0.31	0.66	0.31	51.4
11	T1	679	28	715	4.1	0.883	26.5	LOS B	25.5	184.5	0.81	0.93	1.09	41.8
Approach		881	32	927	3.6	0.883	22.4	LOS B	25.5	184.5	0.70	0.87	0.91	43.6
All Vehicles		2022	79	2128	3.9	0.901	27.2	LOS B	33.9	246.5	0.82	0.94	1.05	41.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 27 May 2021 4:23:58 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Cessnock_Orange\Cessnock_Orange.sip9

MOVEMENT SUMMARY

Site: 101v [2031 PM + development - Conversion (Site Folder: General)]

Cessnock Road / Orange Street Abermain
Stop priority controlled
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 100 seconds (Site Practical Cycle Time)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Cessnock Road														
5	T1	728	17	766	2.3	0.669	10.2	LOS A	20.9	148.9	0.61	0.56	0.61	51.4
6	R2	90	1	95	1.1	* 0.332	23.9	LOS B	3.1	22.1	0.73	0.77	0.73	42.0
Approach		818	18	861	2.2	0.669	11.7	LOS A	20.9	148.9	0.63	0.58	0.63	50.1
North: Orange Street														
7	L2	79	0	83	0.0	0.204	40.2	LOS C	3.3	23.4	0.86	0.75	0.86	35.6
9	R2	152	2	160	1.3	* 0.870	63.3	LOS E	8.9	63.0	1.00	0.96	1.41	28.9
Approach		231	2	243	0.9	0.870	55.4	LOS D	8.9	63.0	0.95	0.89	1.22	30.9
West: Cessnock Road														
10	L2	267	4	281	1.5	0.187	7.6	LOS A	2.8	20.2	0.23	0.64	0.23	52.0
11	T1	829	25	873	3.0	* 0.891	24.7	LOS B	35.4	254.4	0.68	0.74	0.83	42.7
Approach		1096	29	1154	2.6	0.891	20.5	LOS B	35.4	254.4	0.57	0.72	0.68	44.6
All Vehicles		2145	49	2258	2.3	0.891	20.9	LOS B	35.4	254.4	0.63	0.69	0.72	44.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

* Critical Movement (Signal Timing)

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Thursday, 27 May 2021 4:24:01 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Cessnock_Orange\Cessnock_Orange.sip9

MOVEMENT SUMMARY

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

Gingers Lane / Subdivision Access give way T
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Gingers Lane														
5	T1	169	5.0	178	5.0	0.095	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
6	R2	26	5.0	27	5.0	0.025	6.6	LOS A	0.1	0.7	0.34	0.58	0.34	52.2
Approach		195	5.0	205	5.0	0.095	0.9	NA	0.1	0.7	0.04	0.08	0.04	58.8
North: Subdivision Access														
7	L2	102	5.0	107	5.0	0.103	6.6	LOS A	0.4	2.8	0.32	0.60	0.32	52.4
9	R2	68	5.0	72	5.0	0.121	9.5	LOS A	0.5	3.4	0.53	0.75	0.53	50.3
Approach		170	5.0	179	5.0	0.121	7.8	LOS A	0.5	3.4	0.41	0.66	0.41	51.5
West: Gingers Lane														
10	L2	17	5.0	18	5.0	0.010	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.4
11	T1	209	5.0	220	5.0	0.116	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		226	5.0	238	5.0	0.116	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.4
All Vehicles		591	5.0	622	5.0	0.121	2.7	NA	0.5	3.4	0.13	0.23	0.13	56.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 8:54:21 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Gingers_Access\Gingers_Access.sip9

MOVEMENT SUMMARY

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

Gingers Lane / Subdivision Access give way T
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Gingers Lane														
5	T1	256	5.0	269	5.0	0.143	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	94	5.0	99	5.0	0.089	6.6	LOS A	0.4	2.6	0.35	0.60	0.35	52.2
Approach		350	5.0	368	5.0	0.143	1.8	NA	0.4	2.6	0.09	0.16	0.09	57.6
North: Subdivision Access														
7	L2	41	5.0	43	5.0	0.039	6.3	LOS A	0.1	1.0	0.26	0.56	0.26	52.6
9	R2	27	5.0	28	5.0	0.059	11.0	LOS A	0.2	1.6	0.57	0.77	0.57	49.3
Approach		68	5.0	72	5.0	0.059	8.2	LOS A	0.2	1.6	0.39	0.65	0.39	51.2
West: Gingers Lane														
10	L2	63	5.0	66	5.0	0.037	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.4
11	T1	159	5.0	167	5.0	0.089	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		222	5.0	234	5.0	0.089	1.6	NA	0.0	0.0	0.00	0.16	0.00	57.9
All Vehicles		640	5.0	674	5.0	0.143	2.4	NA	0.4	2.6	0.09	0.21	0.09	57.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 8:55:47 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Gingers_Access\Gingers_Access.sip9

MOVEMENT SUMMARY

Site: 101 [2031 AM (Site Folder: General)]

Gingers Lane / Subdivision Access give way T
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Gingers Lane														
5	T1	197	5.0	207	5.0	0.110	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	26	5.0	27	5.0	0.026	6.7	LOS A	0.1	0.7	0.36	0.59	0.36	52.1
Approach		223	5.0	235	5.0	0.110	0.8	NA	0.1	0.7	0.04	0.07	0.04	58.9
North: Subdivision Access														
7	L2	102	5.0	107	5.0	0.107	6.8	LOS A	0.4	2.9	0.35	0.62	0.35	52.3
9	R2	68	5.0	72	5.0	0.134	10.4	LOS A	0.5	3.7	0.56	0.79	0.56	49.7
Approach		170	5.0	179	5.0	0.134	8.2	LOS A	0.5	3.7	0.44	0.69	0.44	51.2
West: Gingers Lane														
10	L2	17	5.0	18	5.0	0.010	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.4
11	T1	243	5.0	256	5.0	0.135	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		260	5.0	274	5.0	0.135	0.4	NA	0.0	0.0	0.00	0.04	0.00	59.5
All Vehicles		653	5.0	687	5.0	0.135	2.6	NA	0.5	3.7	0.13	0.22	0.13	56.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 8:59:29 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Gingers_Access\Gingers_Access.sip9

MOVEMENT SUMMARY

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

Gingers Lane / Subdivision Access give way T
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] %	DEMAND 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	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
East: Gingers Lane														
5	T1	297	5.0	313	5.0	0.166	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
6	R2	94	5.0	99	5.0	0.092	6.8	LOS A	0.4	2.7	0.37	0.61	0.37	52.1
Approach		391	5.0	412	5.0	0.166	1.7	NA	0.4	2.7	0.09	0.15	0.09	57.8
North: Subdivision Access														
7	L2	41	5.0	43	5.0	0.040	6.4	LOS A	0.1	1.0	0.29	0.57	0.29	52.5
9	R2	27	5.0	28	5.0	0.066	12.1	LOS A	0.2	1.7	0.61	0.82	0.61	48.5
Approach		68	5.0	72	5.0	0.066	8.7	LOS A	0.2	1.7	0.42	0.67	0.42	50.9
West: Gingers Lane														
10	L2	63	5.0	66	5.0	0.037	5.6	LOS A	0.0	0.0	0.00	0.58	0.00	53.4
11	T1	184	5.0	194	5.0	0.103	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		247	5.0	260	5.0	0.103	1.4	NA	0.0	0.0	0.00	0.15	0.00	58.1
All Vehicles		706	5.0	743	5.0	0.166	2.3	NA	0.4	2.7	0.09	0.20	0.09	57.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
Delay Model: SIDRA Standard (Geometric Delay is included).
Queue Model: SIDRA Standard.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

Organisation: INTERSECT TRAFFIC PTY LTD | Licence: NETWORK / 1PC | Processed: Saturday, 15 May 2021 9:00:41 PM
Project: C:\Work Documents\Projects\2020\2020.158 - Sawyers Gully Residential PP\Sidra\Gingers_Access\Gingers_Access.sip9