TRAFFIC AND PARKING IMPACT ASSESSMENT OF MODIFICATIONS TO FORESTWAY SHOPPING CENTRE AT FOREST WAY, FRENCHS FOREST

Address: Shop 7, 720 Old Princes Highway Sutherland NSW 2232
Postal: P.O Box 66 Sutherland NSW 1499

Telephone: (02) 9521 7199
Web: www.mclarentraffic.com.au
Email: admin@mclarentraffic.com.au

Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

Transport Planning, Traffic Impact Assessments, Road Safety Audits, Expert Witness

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Development Type: **Modifications to Forestway Shopping Centre**

Site Address: **Forest Way, Frenchs Forest**

Prepared for: **Revelop**

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1 INTRODUCTION

McLaren Traffic Engineering was commissioned by *Revelop* to provide a traffic and parking impact assessment of the proposed alterations and additions to the Forestway Shopping Centre at Forest Way, Frenchs Forest.

1.1 Description and Scale of Development

The characteristics of the existing shopping centre are examined in detail in **Section 3**, with a summary of the existing floor areas provided below:

- Existing Gross Leasable Floor Area (GLFA) of approximately 9,242m^2 including:
  - Approximately 4,186m^2 supermarket GLFA (Woolworths, Aldi)
  - Approximately 2,169m^2 speciality shop GLFA;
  - Approximately 1,384m^2 of office GLFA;
  - Approximately 784m^2 of medical GLFA;
  - Approximately 220m^2 of Gym GLFA.
- Vehicle access to the site is presently provided as follows:
  - Left-in, entry only driveway on Forest Way;
  - Two-way driveway on Russell Avenue;
  - Two-way driveway on Grave Avenue.
- The site presently has a total of 428 car parking spaces, comprised of:
  - 348 spaces in off-street car parking areas;
  - Approximately 80 spaces accessible via Sorlie Place.

The proposed alterations and additions to the development will result in the following:

- Future Gross Leasable Floor Area (GLFA) of approximately 14,019m^2 including:
  - Approximately 7,278m^2 supermarket GLFA (Woolworths, Aldi and Mini Major Retail)
  - Approximately 2,946m^2 speciality shop GLFA;
  - Approximately 1,203m^2 of office GLFA;
  - Approximately 784m^2 of medical GLFA;
  - Approximately 705m^2 of Gym GLFA;
  - A swim school with 1,066m^2 GLFA.

- Access to the site will be as per the existing, with the following changes:
    - Construction of a new signalised intersection on Forest Way providing for vehicle access to and from both directions;
    - Construction of a new pedestrian overpass of Forest Way to replace the at-grade signalised pedestrian crossing.
    - Physical restriction of the Russell Avenue driveway to left-in/left out only;
    - A new driveway access on Grace Avenue will provide access into a new basement car parking area.
- The proposed design includes a total of 585 car parking spaces, comprised of:
    - 505 spaces in off-street parking areas;
    - Approximately 80 spaces accessible via Sorlie Place.

1.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

The proposed development qualifies as a traffic generating development with relevant size and/or capacity under *Clause 2.122* of the *SEPP (Transport and Infrastructure) 2021* as it fronts a State Classified Road (Forest Way) and includes greater than 2,500m^2 of commercial Gross Floor Area (GFA). Accordingly, formal referral to Transport for New South Wales (TfNSW) is necessary as part of the application process and should be undertaken by Northern Beaches Council accordingly.

The proposed development has frontage to a classified road of Forest Way and therefore the consent authority must be satisfied that the development meets *Clause 2.119 of SEPP (Transport and Infrastructure) 2021*.

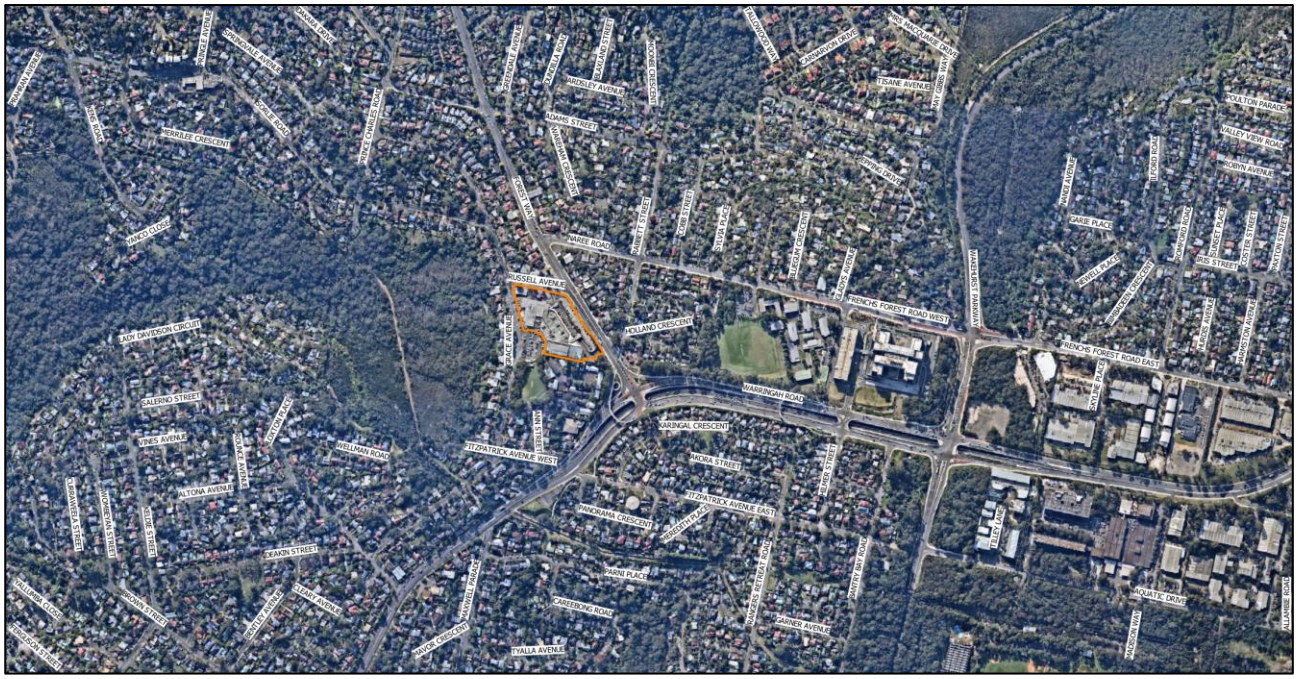
1.3 Site Description

The subject site is currently zoned *E1 – Local Centre* under the Warringah Local Environmental Plan 2011 (WLEP 2011) and is currently occupied by the existing Forestway Shopping Centre. The site has frontages to Forest Way to the east, Russell Avenue to the north and Grace Avenue to the west.

The site is generally surrounded by various low-density residential development with the exception of the Frenchs Forest Public School which adjoins the site to the south.

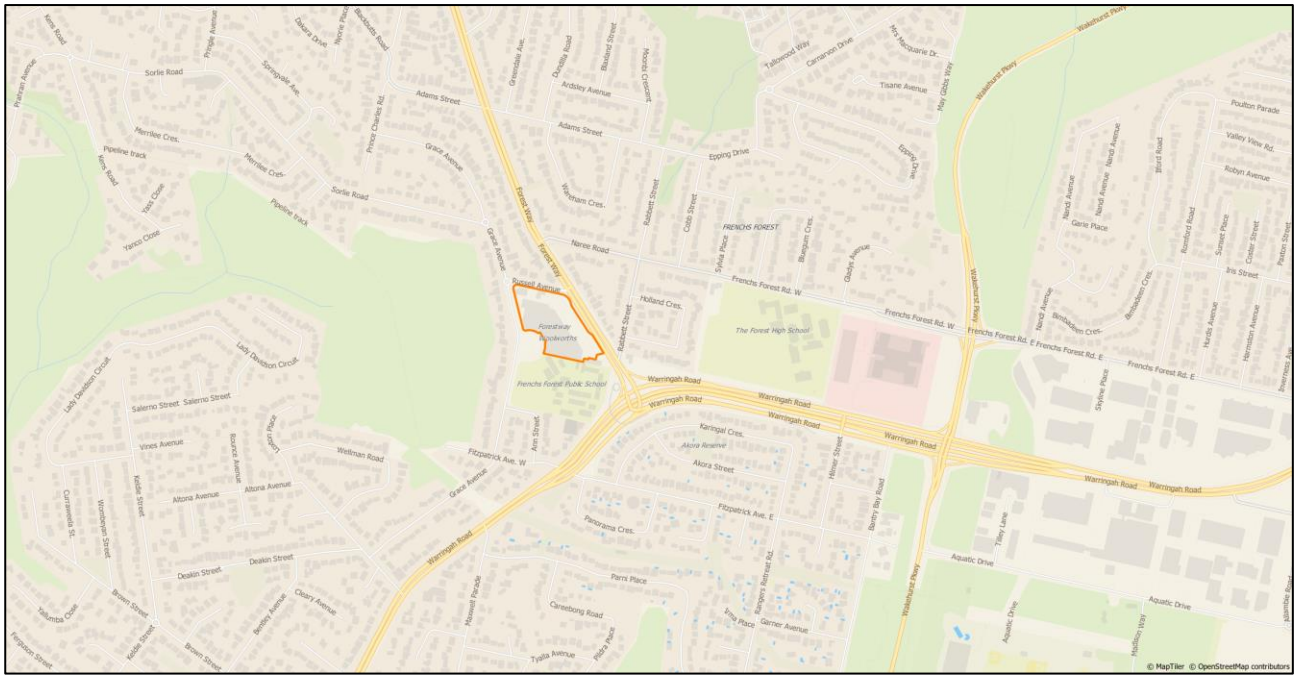
1.4 Site Context

The location of the site is shown on an aerial photo and a street map in **Figure 1** and **Figure 2** respectively.



Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

2 EXISTING TRAFFIC AND PARKING CONDITIONS

2.1 Road Hierarchy

The road network servicing the site has characteristics as described in the following sub-sections.

2.1.1 Forest Way

- Classified State Main Road No. 529
- Approximately 19m wide two-way carriageway, providing for two lanes northbound and three lanes southbound with a narrow concrete median;
- Signposted 70km/h speed limit;
- No parking permitted on either side of the road in the vicinity of the site.

2.1.2 Russell Avenue

- Unclassified Local Road;
- Approximately 8m wide two-way carriageway facilitating a single lane in each direction;
- Signposted “Local Traffic Area” 40km/h speed limit;
- “No Stopping” restrictions on both sides of the road.

2.1.3 Grace Avenue

- Unclassified Local Road;
- Approximately 17.5m wide two-way carriageway facilitating a single traffic lane in either direction and kerbside parking;
- Signposted 40km/h speed limit;
- Unrestricted angle parking on the eastern side of the road, unrestricted parallel parking on the western side of the road.

2.1.4 Sorlie Place

- Unclassified Local Road serving a public car parking area;
- Approximately 7.5m carriageway facilitating a single traffic lane for clockwise circulation only. Parking is permitted at times based on sign posted restrictions;
- Default 50km/h speed restriction applies;
- Parking restrictions include:
    - 1P 8:30 AM – 5:00 PM Monday to Friday;
    - 1P 8:30 AM – 12:30 PM Saturday;
    - Mail Zone;
    - P 5-Minute 8:30 AM – 5:00 PM Monday to Friday;
    - P 5-Minute 8:30 AM – 12:30 PM Saturday;
    - Bus Zone 8:00 AM to 9:30 AM and 2:45 PM – 3:45 PM School Days
    - 2P 8:30 AM – 5:00 PM Monday to Friday;
    - 2P 8:30 AM – 12:30 PM Saturday.

2.1.5 Existing Traffic Management

- Signalised intersection of Forest Way and Warringah Road;
- Signalised intersection of Forest Way and Naree Road;
- Give Way controlled intersection of Forest Way and Russell Avenue;
- Roundabout controlled intersection of Russell Avenue and Grace Avenue;
- Give Way controlled intersection of Sorlie Place and Grace Avenue;
- Pedestrian refuge crossing of Russell Avenue;
- Signalised pedestrian crossing of Forest Way.

2.2 Existing Traffic Environment

Traffic surveys were undertaken on roads and at intersections surrounding the site to provide for a detailed overview of the existing traffic environment. A map depicting the surveys undertaken is provided in **Figure 3**.

The turning movement counts and the pedestrian crossing count were undertaken on Thursday 10 June 2021 between 7:00 AM to 9:30 AM and 2:30 PM to 6:30 PM and on Saturday 12 June 2021 between 10:00 AM to 2:00 PM. The detailed results of the surveys are provided in **Annexure B**.

For the purposes of the traffic analysis, future traffic volumes along Forest Way were provided by TfNSW.

FIGURE 3: TRAFFIC SURVEYS UNDERTAKEN

2.3 Public Transport

The subject site is within 100m walking distance of bus stops on both sides of Forest Way (IDs: 208671 and 208663). These bus stops service existing bus Routes 155 (Bayview Garden Village to Frenchs Forest), 166 (Frenchs Forest to Manly via Dee Why Beach), 260 (Terry Hills to North Sydney), 270 (Terry Hills to City QVB), 271 (Belrose to City QVB), 274 (City QVB to Davidson via Frenchs Forest), 279 (Frenchs Forest to Chatswood), 281 (Davidson to Chatswood), 282 (Davidson and Belrose to Chatswood), 283 (Belrose to Chatswood) and 284 (Duffys Forest and Terrey Hills to Chatswood).

The location of the site subject to the surrounding public transport network is shown in **Figure 4**.

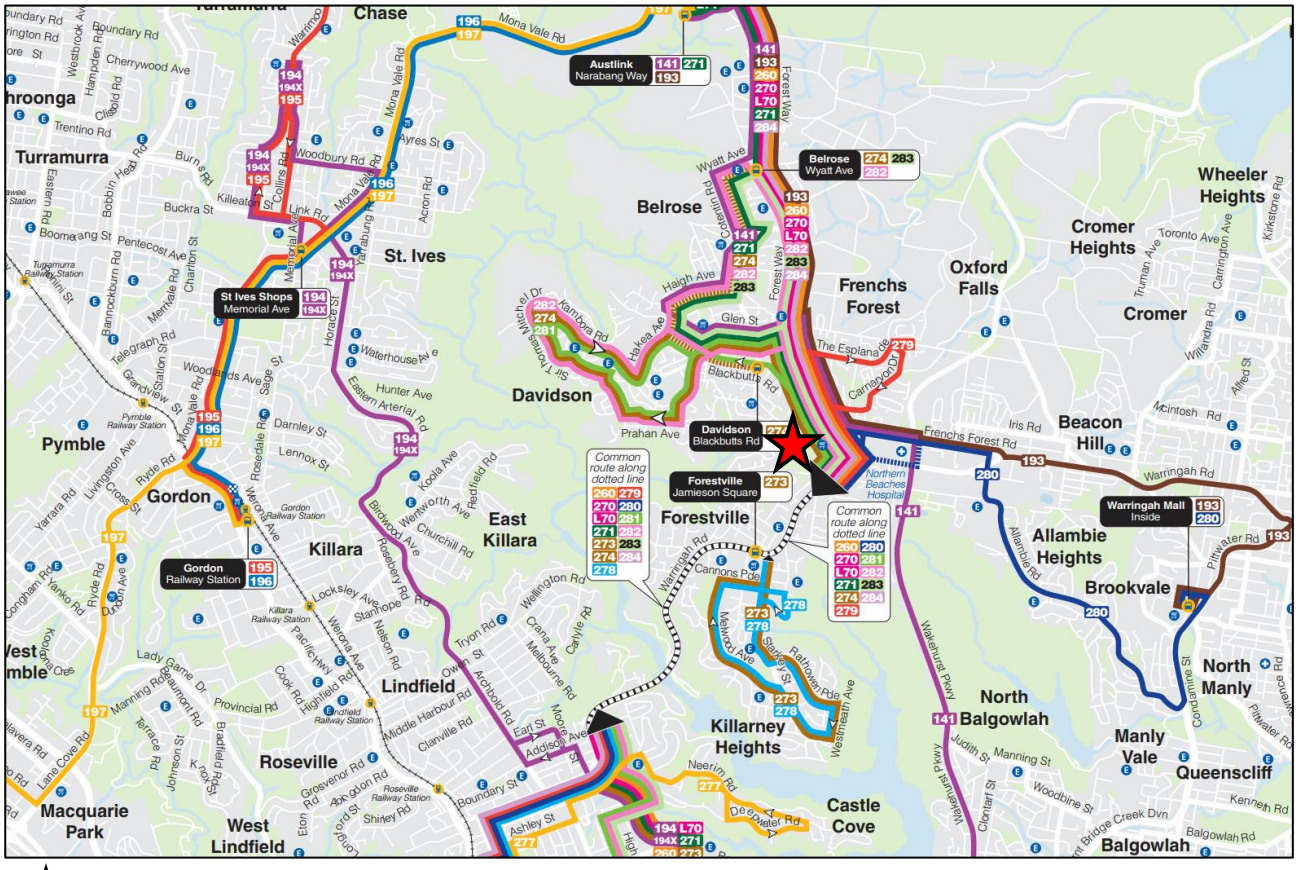


FIGURE 4: PUBLIC TRANSPORT NETWORK MAP

2.4 Future Road and Infrastructure Upgrades

From Northern Beaches Council Development Application tracker and Capital Works Program Map, it appears that there are no future planned road or public transport changes that will affect traffic conditions within the immediate vicinity of the subject site.

Similarly the TfNSW Projects Map does not display any projects in the vicinity of the site.

3 EXISTING SITE

3.1 Details of Existing Shopping Centre

The existing Forestway Shopping Centre has the following scale relevant to traffic and parking impacts:

- Existing Gross Leasable Floor Area (GLFA) of approximately 7,447m^2 including:
  - Approximately 4,186m^2 supermarket GLFA (Woolworths, Aldi)
  - Approximately 2,169m^2 speciality shop GLFA;
  - Approximately 1,384m^2 of office GLFA;
  - Approximately 784m^2 of medical GLFA;
  - Approximately 220m^2 of Gym GLFA.
- Vehicle access to the site is presently provided as follows:
  - Left-in, entry only driveway on Forest Way;
  - Two-way driveway on Russell Avenue;
  - Two-way driveway on Grave Avenue.
- The site presently has a total of 428 car parking spaces, comprised of:
  - 348 spaces in off-street car parking areas;
  - Approximately 80 spaces accessible via Sorlie Place.
- Existing loading and servicing facilities are provided as follows:
  - All stores other than Woolworths receive deliveries and have waste collected in a loading dock accessed from Grace Avenue. The largest vehicle to use this dock is a 15.5m long articulated vehicle serving ALDI, which is required to reverse in from the street.
  - Woolworths presently receives deliveries and undertakes waste collection from Sorlie Place in a dedicated dock. The existing dock does not provide sufficient dimensions for the service vehicles to be fully contained within the site.

The centre has pedestrian entry points from Russell Avenue and from Sorlie Place; pedestrians may also by walking through the existing car park from Forest Way, though this entry is poorly signposted.

3.2 Public and Street Car Parking

3.2.1 Sorlie Place Car Park

A Council car park exists at the rear of the site with a total of 73 to 81 car parking spaces depending on time of day as there is a bus zone along the frontage of the Frenchs Forest Public School during school drop-off and pick-up hours.

The Council car park generally serves users of the Forestway Shopping Centre and parents dropping-off or picking-up children from the Frenchs Forest Public School. All parking spaces within the car park are time restricted to between 15 minute and 2-hour car parking.

3.2.2 Grace Avenue Street Car Parking

Ninety-degree angle car parking for 18 cars is provided along the frontage of the site to Grace Avenue. These spaces are not time restricted and are likely to provide car parking for residents, staff of the school and staff of the shopping centre.

3.3 Existing Parking Demand

The existing parking demands of the shopping centre have been estimated based on the rates provided in the RMS Guide to Traffic Generating Developments 2002 as per the following:

> *The relative parking demand characteristics of different floor area types can be seen in the following indicative model:*
>
> *Peak Parking = 24 A(S) + 40 A(F) + 42 A(SM) + 45 A(SS) + 9 A(OM)*
>
> *Demand (per 1,000m2). Where:*
>
> *A(S): Slow Trade GLFA, includes major Department stores such as David Jones and Grace Brothers, furniture, electrical and utility goods stores.*
>
> *A(F): Faster Trade GLFA, includes discount department stores such as K-Mart and Target, together with larger specialist stores such as Fosseys.*
>
> *A(SM): Supermarket GLFA, includes stores such as Franklins and large fruit markets.*
>
> *A(SS): Speciality Shops and Secondary retail GLFA, includes speciality shops and take-away stores such as McDonalds. These stores are grouped since they tend not be primary attractors to the centre.*
>
> *A(OM): Offices, medical GLFA.*

Using the above rates, the existing centre requires approximately 303 car parking spaces.

3.4 Existing Traffic Generation

The existing peak hour traffic generation has been determined based on the traffic surveys undertaken on a Thursday and a Saturday as outlined in **Section 2.2**. The traffic generation of the centre on the days surveyed is outlined in **Table 1**.

TABLE 1: OBSERVED ENTRY AND EXIT MOVEMENTS

Peak	Trips IN	Trips OUT	Total Trips
AM	214	182	396
PM	290	325	615
Weekend	318	300	618

The RMS Guide to Traffic Generation Developments 2002 provides guidance on the annual fluctuations of the traffic generation of shopping centres, with the relevant extract provided as **Figure 5**.

Month	Variation (compared with average)	Month	Variation % (compared with average)
January	0.89	July	1.03
February	0.87	August	1.01
March	0.97	September	0.96
April	0.96	October	0.98
May	1.01	November	1.08
June	0.97	December	1.28

SOURCE: RMS GUIDE TO TRAFFIC GENERATING DEVELOPMENTS 2002

FIGURE 5: ANNUAL FLUCTUATIONS OF SHOPPING CENTRE TRAFFIC

As provided by **Figure 5**, the traffic generation of shopping centres is typically 97% of the average. The adjusted traffic generation of the site to reflect the average is provided in **Table 2**.

TABLE 2: NORMALISED ENTRY AND EXIT MOVEMENTS

Peak	Trips IN	Trips OUT	Total Trips
AM	221	188	408
PM	299	335	634
Weekend	328	309	637

3.4.1 Comparison to RMS Guide Traffic Generation Rates

The peak hour traffic generation rates of shopping centres are typically estimated by using the following models:

Thursday:

V(P) = 20 A(S) + 51 A(F) + 155 A(SM) + 46 A(SS) + 22 A(OM)

(vehicle trips per 1000m2).

Friday:

V(P)= 11 A(S) + 23 A(F) + 138 A(SM) + 56 A(SS) + 5 A(OM)

(vehicle trips per 1000m2).

Saturday:

PVT= 38 A(S) + 13 A(F) + 147 A(SM) + 107 A(SS)

(vehicle trips per 1000m2).

where:

A(S): Slow Trade gross leasable floor area (Gross Leasable Floor Area in square metres) includes major department stores such as David Jones and Grace Bros., furniture, electrical and whitegoods stores.

A(F): Faster Trade GLFA - includes discount department stores such as K-Mart and Target, together with larger specialist stores such as Fosseys.

A(SM): Supermarket GLFA - includes stores such as Franklins and large fruit markets.

A(SS): Specialty shops, secondary retail GLFA - includes specialty shops and take-away stores such as McDonalds. These stores are grouped as they tend to not be primary attractors to the centre.

A(OM): Office, medical GLFA: includes medical centres and general business offices.

The traffic generation of the existing shopping centre has been estimated using the above rates, with the results summarised below and a comparison to the actual (adjusted) traffic generation provided.

FIGURE 6: OBSERVED VS PREDICTED TRAFFIC GENERATION

Land Use	Peak Hour	Rate	Trips IN[2]	Trips OUT[2]	Total Trips
ESTIMATED TRAFFIC GENERATION					
Shopping Centre	PM	RMS Guide 2002	398	398	796
	Weekend		424	424	786
OBSERVED TRAFFIC GENERATION					
Shopping Centre	AM[1]	N/A	221	188	408
	PM		299	335	634
	Weekend		328	309	637
COMPARISON					
Shopping Centre	AM[1]	N/A	56% of PM Rate	47% of PM Rate	51% of PM Rate
	PM		75%	84%	80%
	Weekend		77%	73%	81%

Notes:

(1) No rate is provided for the AM peak hour traffic generation of a shopping centre in the RMS Guide.

(2) Typical retail traffic split of 50% IN/50% OUT assumed.

As shown, the existing shopping centre is generating traffic at approximately 80% of the rate predicted by the RTA Guide to Traffic Generating Developments.

3.5 Existing Road Network Performance

The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.1, **Table 3** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure C**.

TABLE 3: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.1)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3]	Control Type	Worst Movement	95th Percentile Queue
EXISTING PERFORMANCE							
Forest Way / Naree Road	AM	0.71	20.2	**B**	Signals	RT from Naree Road (E)	33.2 veh (241.4m) Forest Way (N)
	PM	0.68	21.6	**B**		RT from Naree Road (E)	29.4 veh (211.3m) Forest Way (N)
	WE	0.65	25.0	**B**		RT from Naree Road (E)	28.4 veh (211.3m) Forest Way (N)
Warringah Road / Forest Way	AM	0.90	54	**D**	Signals	RT from Warringah Road (E)	38.2 veh (277.3m) Warringah Road (S)
	PM	0.77	42.8	**D**		RT from Forest Way (N)	34.6 veh (244.4m) Warringah Road (S)
	WE	0.91	46.6	**B**		RT from Warringah Road (E)	34.7 veh (243.2m) Warringah Road (S)
Forest Way / Russell Avenue	AM	1.00	3.8 (Worst: >70)	**N/A** (Worst: F)	Give Way	RT from Russell Avenue (W)	6.5 veh (47.6m) Forest Way (N)
	PM	1.57	17.4 (Worst: >70)	**N/A** (Worst: F)		RT from Russell Avenue (W)	14 veh (99.9m) Forest Way (N)
	WE	1.36	7.6	**N/A** (Worst: F)		RT from Russell Avenue (W)	14.1 veh (101.7m) Forest Way (S)
Forest Way Signalised Pedestrian Crossing	AM	0.50	4	**A**	Signals	T from Forest Way (S)	19.6 veh (143.6m) Forest Way (N)
	PM	0.46	2.3	**A**		T from Forest Way (S)	11.3 veh (81.6m) Forest Way (S)
	WE	0.4	3.0	**A**		T from Forest Way (S)	11.3 veh (81.6m) Forest Way (S)
Grace Avenue / Russell Avenue	AM	0.25	4.6 (Worst: 9.4)	**A** (Worst: A)	Roundabout	UT from Russell Avenue (E)	1.5 veh (10.4m) Grace Avenue (N)
	PM	0.34	5.3 (Worst: 9.7)	**A** (Worst: A)		UT from Russell Avenue (E)	2.1 veh (15.2m) Russell Avenue (E)
	WE	0.29	5.1	**A**		UT from Russell Avenue (E)	1.7 veh (12.2m) Russell Avenue (E)

NOTES:
(1) The Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.
(2) The average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.
(3) The Level of Service is a qualitative measure of performance describing operational conditions. There are six levels of service, designated from A to F, with A representing the best operational condition and level of service F the worst. The LoS of the intersection is shown in bold, and the LoS of the most disadvantaged movement is shown in brackets.
(4) No overall Level of Service is provided for Give Way and Stop controlled intersections as the low delays associated with the dominant movements skew the average delay of the intersection. The Level of Service of the worst approach is an indicator of the operation of the intersection, with a worse Level of Service corresponding to long delays and reduced safety outcomes for that approach.

The results of the SIDRA model indicate that other than the intersections of Russell Avenue / Forest Way and Warringah Road / Forest Way, all intersections are operating with a high level of efficiency, exhibiting a Level of Service of A or B.

The intersection of Russell Avenue and Forest Way is presently operating with a poor level of service of “F” in the peak hours, with the right turn from Russell Avenue onto Forest Way being the worst performing movement. Based on the criteria provided in the RTA Guide to Traffic Generating Developments, this intersection should be considered for an upgrade. Notwithstanding this, the poor level of service only applies to the right turn from the minor road onto the major road, which is expected and acts to disincentivize drivers from making this turn.

The intersection of Warringah Road and Forest Way is presently operating with a level of service of ”D” in all peak hours.

3.6 Future Road Network Performance – Background Growth

Transport for NSW has provided future weekday AM and PM peak hour volumes for the base year 2032 for the Forest Way corridor to enable the assessment of the impact on the site on the traffic volumes expected in that year. The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.1, **Table 4** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure C**.

TABLE 4: FUTURE 2032 BASE YEAR INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.1)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3]	Control Type	Worst Movement	95th Percentile Queue
2032 Base Model + Development Performance							
Forest Way / Naree Road	AM	0.76	20.9	**B**	Signals	RT from Naree Road (E)	23.2 veh (168.5m) Forest Way (N)
	PM	0.89	25.7	**B**		RT from Naree Road (E)	34 veh (244.7m) Forest Way (N)
Warringah Road / Forest Way	AM	0.91	52.3	**D**	Signals	RT from Warringah Road (E)	25 veh (181.2m) Warringah Road (S)
	PM	0.91	49.8	**D**		RT from Forest Way (N)	27.1 veh (191.1m) Warringah Road (S)
Forest Wal / Russell Avenue	AM	1.02	6.2 (Worst: >70)	**N/A** (Worst: F)	Give Way	RT from Russell Avenue (W)	3.1 veh (22.7m) Forest Way (N)
	PM	2.73	63.1 (Worst: >70)	**N/A** (Worst: F)		RT from Russell Avenue (W)	12 veh (85m) Forest Way (N)
Forest Way Signalised Pedestrian Crossing	AM	0.54	4.3	**A**	Signals	T from Forest Way (S)	13.7 veh (100m) Forest Way (N)
	PM	0.49	3	**A**		T from Forest Way (S)	7.6 veh (54.4m) Forest Way (N)

As shown, the future 2032 performance is expected to be similar to the existing performance at each of the intersections modelled.

4 PARKING ASSESSMENT

4.1 Council Parking Requirement

Reference is made to the *Warringah Development Control Plan 2011* (WDCP) *Appendix 1 Car Parking Requirements* which designates the following parking rates applicable to the proposed development:

> *Office Premises*
>
> *1 space per 40m² GFA*
>
> *Shop (includes retail / business component of shop top housing, retail premises and neighbourhood shop)*
>
> *1 space per 16.4 m² GLFA (6.1 spaces per 100 m² GLFA).*
>
> *The above rate may be varied in shopping centre complexes, such as shopping malls, where multi-purpose trips predominate, in accordance with the following:*
>
> - *for 0-10,000 m² GLFA - 6.1 spaces per 100 m² GLFA*
> - *for 10,000-20,000 m² GLFA - 5.6 spaces per 100 m² GLFA*
> - *for 20,000-30,000 m² GLFA - 4.3 spaces per 100 m² GLFA*
> - *for more than 30,000 m² GLFA - 4.1 spaces per 100 m² GLFA*
>
> *Gymnasium*
>
> *4.5 spaces per 100m² GFA*
>
> *Medical Centre*
>
> *4 spaces per 100m²*

Table 5 presents the parking requirements of the proposal according to the WDCP car parking rates.

TABLE 5: DCP PARKING RATES

Land Use	Scale	Rate	Spaces Required
Office Premises	1,203m²	1 space per 40m²	30
Shops	10,224m²	5.6 spaces per 100m² GLFA	573
Gymnasium	705m²	4.5 spaces per 100m² GFA	32
Swim School	1,066m²	4.5 spaces per 100m² GFA(1)	48
Medical Centre	784m²	4 spaces per 100m²	32
Total	**-**	**-**	**715**

Note: (1) The WDCP does not provide a car parking rate for swim schools and the gym rate has been adopted.

As shown, strict application of the WDCP requires the provision of 715 car parking spaces.

4.2 RTA Guide Parking Assessment

The RTA Guide to Traffic Generating Developments provides a recommendation for the parking requirement of shopping centre developments which can be applied if the gross leasable floor areas of future retail categories within the centre are known. The extract from the RTA Guide is provided below for reference.

> *Peak Parking = 24 A(S) + 40 A(F) + 42 A(SM) + 45 A(SS) + 9 A(OM)*
>
> *Demand (per 1,000m2).*
>
> *where:*
>
> *A(S): Slow Trade GLFA, includes major Department stores such as David Jones and Grace Brothers, furniture, electrical and utility goods stores.*
>
> *A(F): Faster Trade GLFA, includes discount department stores such as K-Mart and Target, together with larger specialist stores such as Fosseys.*
>
> *A(SM): Supermarket GLFA, includes stores such as Franklins and large fruit markets.*
>
> *A(SS): Speciality Shops and Secondary retail GLFA, includes speciality shops and take-away stores such as McDonalds. These stores are grouped since they tend not be primary attractors to the centre.*
>
> *A(OM): Offices, medical GLFA.*

It is noted that the parking requirements of a Gym provided in the RTA Guide are consistent with the WDCP.

The parking requirements of the proposed development according to the rates above are summarised in **Table 6**.

TABLE 6: RTA GUIDE CAR PARKING REQUIREMENTS

Land Use	Scale	Rate	Spaces Required
Office Premises	1,203m^2	9 spaces per 1,000m^2 GLFA	11
Supermarket	7,278m^2	42 spaces per 1,000m^2 GLFA	306
Speciality Shops	2,946m^2	45 spaces per 1,000m^2 GLFA	133
Gymnasium	705m^2	4.5 spaces per 100m^2 GFA	32
Swim School	1,066m^2	4.5 spaces per 100m^2 GFA(1)	48
Total	-	-	530

Note: (1) The RTA Guide does not provide a car parking rate for swim schools and the gym rate has been adopted.

As shown, using the rates provided in the RTA Guide to Traffic Generating Developments 2002, the site requires a total of 530 car parking spaces. A total of 585 car parking spaces are proposed to be available to the site, exceeding this requirement by 55 spaces.

4.3 Disabled Parking

The WDCP does not outline disabled car parking rates for shopping centre developments. As such, reference is made to *D4D6* of the *National Construction Code 2022* (NCC)which categorises shopping centre as a Class 6 building and therefore requires the provision of disable car parking at a rate of:

> *Class 6 (i) with up to 1000 carparking spaces - 1 space for every 50 carparking spaces or part thereof.*

In accordance with the BCA requirements, 12 disabled car parking spaces are to be provided. The proposed car parking layout details the provision of 11 disabled car parking spaces as per with *AS2890.6:2022*, a shortfall of 1 space. The scheme can be easily adjusted to provide for 12 spaces as required and this change can be conditioned.

4.4 Bicycle Parking Requirements

The WDCP 2011 Section C3(A) states the following with regards to bicycle parking requirements:

MINIMUM BICYCLE PARKING REQUIREMENTS		
Land Use	*Column 1 High–Medium Security Level**	*Column 2 High–Low Security Level***
Business and Retail Premises	*1 per 200m2 GFA*	*Visitors: 1 per 600m2 GFA*
Recreation Facility (indoor, outdoor, or major)	*1 per 4 employees PLUS 1 per 1500 spectator places*	*1 per 200m2 GFA 1 per 250 spectator places*

The under a strict application of the WDCP, the proposal requires bicycle parking as outlined in **Table 7**.

TABLE 7: BICYCLE PARKING REQUIREMENTS

Land Use	Scale	High-Medium Security Level		High-Low Security Level	
		Rate	Requirement	Rate	Requirement
Business and Retail Premises	11,427m^2 GFA	1 per 200m^2 GFA	58	1 per 600m^2 GFA	20
Recreation Facility	1,771m^2 GFA 20 staff (assumed)	1 per 4 employees plus 1 per 1,500 spectator places	5	1 per 200m^2 GFA 1 per 250 spectator places	9
Total			63		29

The provision of 63 bicycle spaces for staff and 29 bicycle spaces for visitors can be accommodated on-site and this matter can be subject to condition.

4.5 Motorcycle Parking Requirements

The WDCP 2011 does not require the provision of motorcycle parking. No motorcycle parking has been provided, satisfying the WDCP requirements.

4.6 Servicing & Loading

The WDCP 2011 states the following with regards to on-site loading and servicing areas:

> *On-site loading and unloading*
>
> *6. Facilities for the loading and unloading of service, delivery and emergency vehicles are to be: appropriate to the size and nature of the development; screened from public view; and designed so that vehicles may enter and leave in a forward direction.*

All loading and waste collection activities will take place in the existing loading dock facilities accessed from Grace Avenue and Sorlie Place. The existing loading dock accessed from Grace Avenue will be slightly modified to accommodate an additional dock for the new floor areas of the site. Swept path testing has been undertaken to demonstrate that the design vehicle (a 15.5m long articulated vehicle) will be able to acceptably service the proposed mini-major retail premises, with the results provided in **Annexure D** for reference.

All other loading and servicing activities on the site will remain consistent with the present operation.

It is expected and typical that a loading dock management plan be provided for shopping centre sites and this can be provided prior to the issue of an occupation certificate.

4.7 Car Park Design & Compliance

The car parking layout as depicted in **Annexure A,** has been assessed to achieve the relevant clauses and objectives of *AS2890.1:2004*, *AS2890.2:2018* and *AS2890.6:2022*. Any variances from standards are addressed in the following subsections including required changes, if any. Swept path testing has been undertaken and are reproduced within **Annexure D** for reference.

The proposed car parking and vehicular access design achieves the following:

- 12m width two-way driveway facilitating access to Forest Way;
- 7.5m width two-way driveway facilitating access to Grace Avenue;
- 16.5m width two-way driveway facilitating access to Russell Avenue;
- Pedestrian sight triangle of 2m by 2.5m at the property boundary at each driveway;
- Minimum 6.6m width parking aisles;
- Compliant ramp grades not exceeding 20% and no grade change greater than 12.5% over 2m length;
- Minimum 5.4m length, 2.6m width car parking spaces;
- Minimum 5.4m length, 2.4m width disabled spaces with adjacent associated 5.4m length, 2.4m width shared space;
- Minimum 0.3m clearance to high objects from trafficable areas;
- Minimum headroom of 2.2m for general circulation and 2.5m headroom clearance provided over disabled and adaptable parking areas.

Whilst the plans have been assessed to comply with the relevant standards, it is usual and expected that a design certificate be required at the Construction Certificate stage to account for any changes following the development application.

5 TRAFFIC ASSESSMENT

The impact of the expected traffic generation levels associated with the subject proposal is discussed in the following sub-sections.

5.1 Traffic Generation

Traffic generation rates for the relevant land uses are provided in the *RTA Guide to Traffic Generating Developments (2002)* as adopted by Transport for New South Wales (TfNSW) and recent supplements and are as follows:

Shopping Centres

Thursday:
V(P) = 20 A(S) + 51 A(F) + 155 A(SM) + 46 A(SS) + 22 A(OM) (vehicle trips per 1000m$_2$).

Friday:
V(P)= 11 A(S) + 23 A(F) + 138 A(SM) + 56 A(SS) + 5 A(OM) (vehicle trips per 1000m$_2$).

Saturday:
PVT= 38 A(S) + 13 A(F) + 147 A(SM) + 107 A(SS) (vehicle trips per 1000m$_2$). where:

A(S): Slow Trade gross leasable floor area (Gross Leasable Floor Area in square metres) includes major department stores such as David Jones and Grace Bros., furniture, electrical and whitegoods stores.

A(F): Faster Trade GLFA - includes discount department stores such as K-Mart and Target, together with larger specialist stores such as Fosseys.

A(SM): Supermarket GLFA - includes stores such as Franklins and large fruit markets.

A(SS): Specialty shops, secondary retail GLFA - includes specialty shops and take-away stores such as McDonalds. These stores are grouped as they tend to not be primary attractors to the centre.

A(OM): Office, medical GLFA: includes medical centres and general business offices.

Gymnasiums

Metropolitan Regional CBD Centres.

Evening Peak Hour Vehicle Trips = 3 trips per 100m$_2$ GFA.

The resulting traffic generation is summarised in **Table 8**.

TABLE 8: ESTIMATED TRAFFIC GENERATION

Land Use	Scale	Thursday PM Rate	Total Trips	IN	OUT
Office Premises	1,203m^2	22 trips per 1,000m^2 GLFA	26	13	13
Supermarket	7,278m^2	155 trips per 1,000m^2 GLFA	1128	564	564
Speciality Shops	2,946m^2	46 trips per 1,000m^2 GLFA	136	68	68
Gymnasium	705m^2	9 trips per 100m^2 GFA	21	11	11
Swim School	1,066m^2	9 trips per 100m^2 GFA(1)	32	16	16
Existing Site Generation			634	299	335
Sub-Total New Trips			709	373	337
20% Discount on Shopping Centre Trips			131	69	62
Total New Trips			**578**	**303**	**275**

Note:
(1) The RTA Guide does not provide a traffic generation rate parking rate for swim schools and the gym rate has been adopted.
(2) A 50% IN / 50% OUT distribution of traffic has been adopted for all uses.

As per the existing traffic generation of the site, it is reasonable to assume that the AM peak traffic generation of the site will be 50% of the PM peak.

The expected traffic generation associated with the proposed development is in the order of **289** vehicle trips in the AM peak period (152 in, 137 out) and **578** vehicle trips in the PM peak period (303 in, 275 out).

It is noted that the RTA Guide to Traffic Generating Developments does not provide information regarding the change in traffic generation for the expansion of existing shopping centre sites. The site already includes an anchor tenant (Woolworths) which is expected to draw a significant amount of trade to the site.

It is unlikely that the addition of the additional floor area to the centre will increase the traffic generated by the site by the amount outlined in **Table 8**, however these numbers have been adopted as a conservative approach.

5.2 Traffic Assignment

The road network, traffic surveys and locations of residential areas surrounding the site have been assessed and the traffic assignment shown in **Figure 7** and **Figure 8** has been assumed for all traffic to and from the site.

5.3 Proposed Road Upgrade Works

To ensure that the road network maintains an acceptable level of performance, several modifications to the existing road network are proposed:

- Removal of existing signalised pedestrian crossing of Forest Way;
- New signalised intersection providing for left and right turns into and out of the site from Forest Way.
- Construction of pedestrian overpass including lift facilities to facilitate a safe crossing of Forest Way for pedestrians.
- Construction of a concrete median in Russell Avenue to restrict the Russell Avenue driveway to left-in / left-out movements only.

These road network modifications have been discussed with Transport for NSW and it is understood that this arrangement is acceptable. It is expected that further consultation with Transport for NSW will be required subsequent to Council referring the application as required under Clause 2.122 of State Environmental Planning Policy (Transport and Infrastructure 2021).

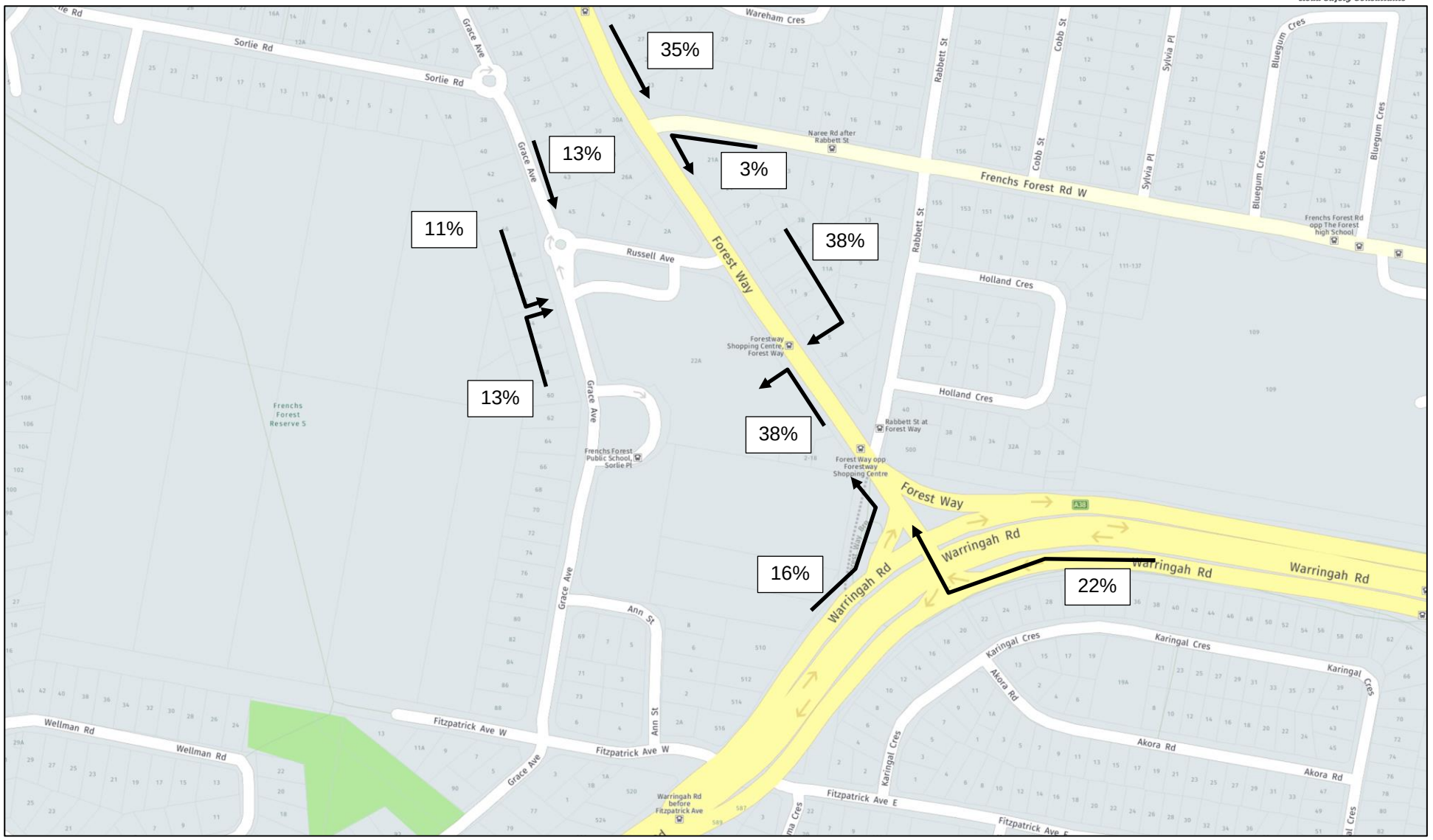


FIGURE 7: TRAFFIC DISTRIBUTION – ENTERING TRAFFIC

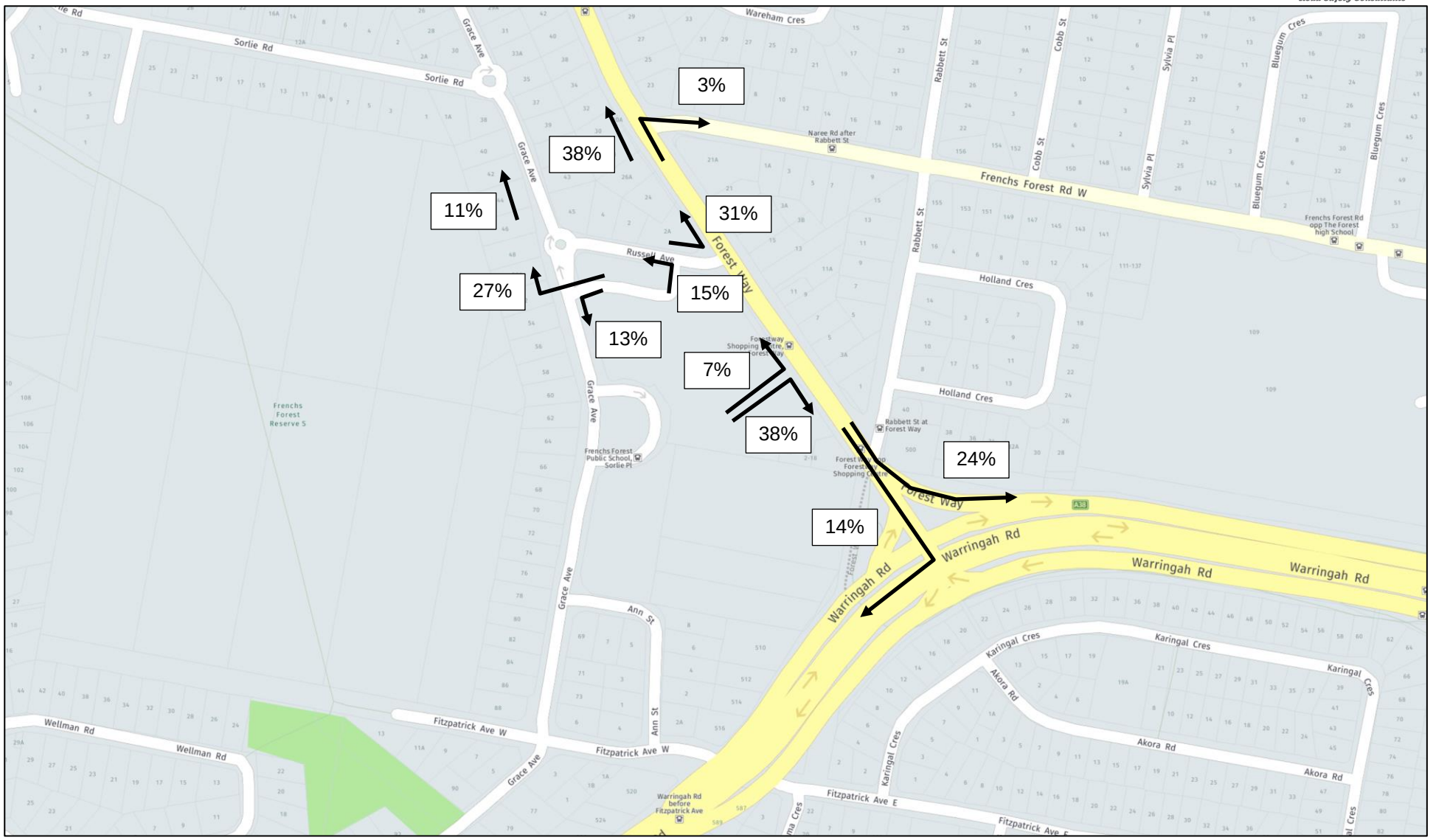


FIGURE 8: TRAFFIC DISTRIBUTION – EXITING TRAFFIC

5.4 Traffic Impact

The traffic generation outlined in **Section 5.1** & **5.2** above has been added to the existing traffic volumes recorded. SIDRA INTERSECTION 9.1 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 9** and **Table 10**.

TABLE 9: INTERSECTION PERFORMANCE – FOREST WAY CORRIDOR (2032 BASE YEAR) (SIDRA INTERSECTION 9.1)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/vehicle)	Level of Service[3]	Control Type	Worst Movement	95th Percentile Queue
2032 + Development Performance							
Forest Way / Naree Road	AM	0.77	20.8	**B**	Signals	RT from Forest Way (S)	38.9 veh (282.6m) Forest Way (N)
	PM	0.95	31.4	**C**		RT from Naree Road (E)	72.2 veh (518.5m) Forest Way (N)
Warringah Road / Forest Way	AM	0.91	53.6	**D**	Signals	RT from Warringah Road (E)	40.8 veh (295.8m) Warringah Road (S)
	PM	0.98	55.6	**D**		RT from Forest Way (N)	45.9 veh (323.3m) Warringah Road (S)
Forest Way / Russell Avenue	AM	1.03	7 (Worst: >70)	**N/A** (Worst: F)	Give Way	RT from Russell Avenue (W)	9.1 veh (66.4m) Forest Way (N)
	PM	2.32	38 (Worst: >70)	**N/A** (Worst: F)		RT from Russell Avenue (W)	29.7 veh (211.3m) Forest Way (N)
Forest Way / Centre Entry	AM	0.64	6.1	**A**	Signals	RT from Centre Entry (W)	15 veh (116.5m) Forest Way (S)
	PM	0.94	10.6	**A**		RT from Forest Way (N)	24.2 veh (175.1m) Forest Way (S)

Notes: Refer to **Table 3**

As shown, the intersections along Forest Way maintain the same level as performance as the 2032 base case under the proposed intersection layout and with the development traffic volumes.

TABLE 10: INTERSECTION PERFORMANCE – LOCAL INTERSECTIONS (SIDRA INTERSECTION 9.1)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3][4]	Control Type	Worst Movement	95th Percentile Queue
FUTURE PERFORMANCE							
Grace Avenue /Russell Avenue	AM	0.28	5.8 (Worst: 10.5)	**A** (Worst: A)	Roundabout	UT from Russell Avenue	1.7 veh (12m) Grace Avenue
	PM	0.46	7 (Worst: 11)	**A** (Worst: A)		UT from Russell Avenue	3.3 veh (23.6m) Russell Avenue
Grace Avenue /Site Driveway	AM	0.15	1.3 (Worst: 7.9)	**NA** (Worst: A)	Give Way	RT from Site Driveway	0.3 veh (1.9m) Site Driveway
	PM	0.20	2.1 (Worst: 9.6)	**NA** (Worst: A)		RT from Site Driveway	0.7 veh (4.8m) Site Driveway
Site Driveway /Russell Avenue	AM	0.10	1.8 (Worst: 6)	**NA** (Worst: A)	Give Way	LT from Site Driveway	0.3 veh (2.1m) Site Driveway
	PM	0.18	2 (Worst: 6.5)	**NA** (Worst: A)		LT from Site Driveway	0.6 veh (4.4m) Site Driveway

As shown, the intersection of Grace Avenue and Russell Avenue and the two driveways to Russell Avenue and Grace Avenue will all maintain an acceptable Level of Service under future conditions.

5.5 Residential Amenity

Noting that the reliance on local streets to facilitate access to the site was a significant factor in the refusal for the previous Development Application on the site, a more modest reliance on local streets is proposed as part of this application. The implementation of a new signalised intersection on Forest Way is expected to result in a net decrease in traffic using the local road network to enter and exit the site, even considering the proposed increased scale of development.

6 CONCLUSIONS

In view of the foregoing, the subject proposal at Forest Way, Frenchs Forest (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts. The following outcomes of this traffic impact assessment are relevant to note:

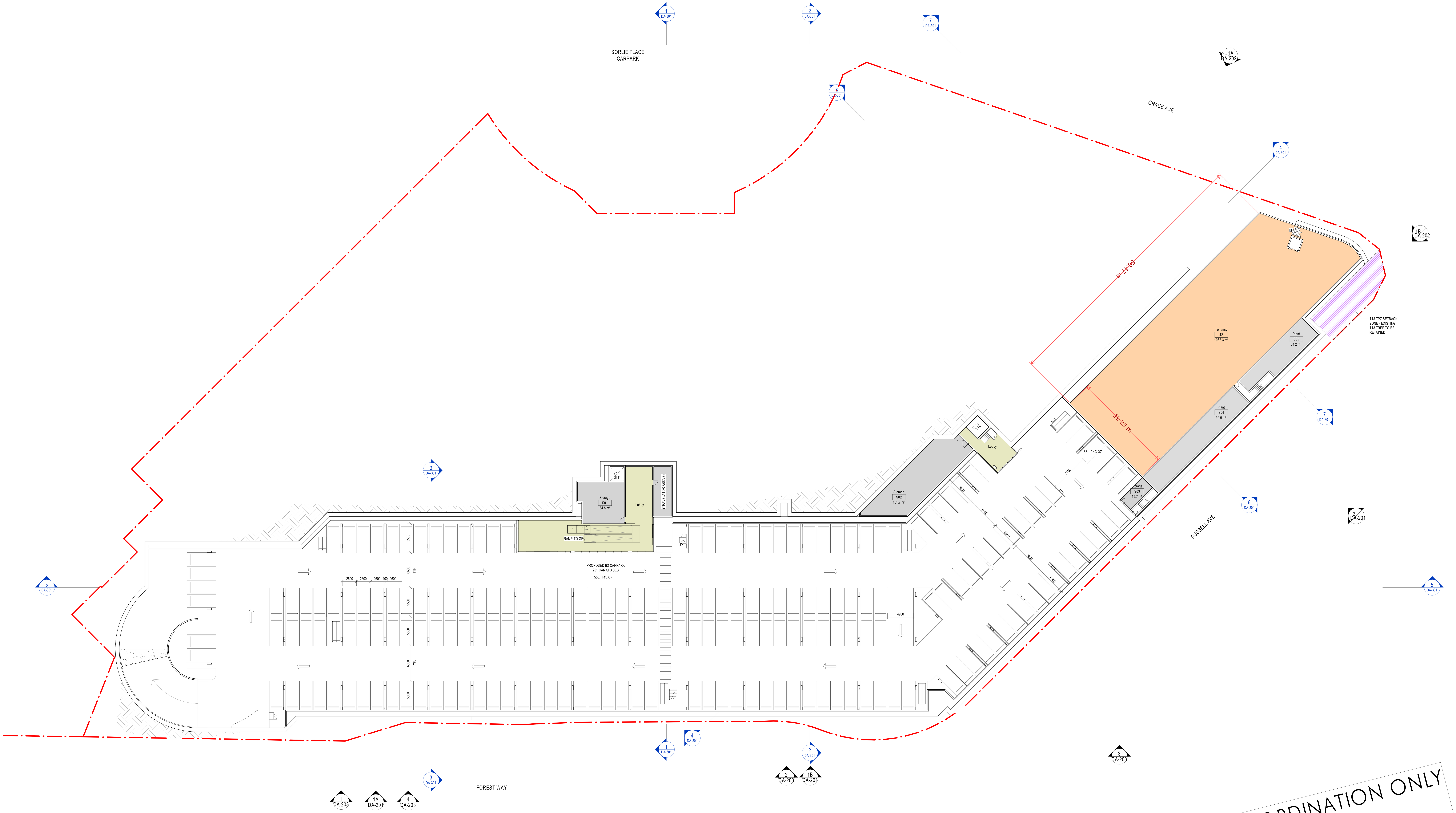
- The proposal includes the provision of 505 car parking spaces within a proposed carpark and the continued use of the approximately 80 spaces available in Sorlie Place. This provision of car parking is adequate to accommodate the parking demand of 530 spaces expected for the site based on the RTA Guide to Traffic Generating Developments 2002.
- The WDCP requires the provision of 63 staff and 29 visitor bicycle parking spaces. There is ample opportunity for these spaces to be provided on-site in accordance with a condition of consent.
- The parking areas of the site have been assessed against the relevant sections of *AS2890.1:2004*, *AS2890.2:2018* and *AS2890.6:2022* and have been found to satisfy the objectives of each standard. Swept path testing of the proposed loading facility is provided in **Annexure D** for reference.
- The traffic generation of the proposed development has been estimated to be some additional **289** trips in the AM peak period (152 in, 137 out) and **578** trips in the PM peak period (303 in, 275 out). The impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.1, indicating that there will be no detrimental impact to the performance of the intersections as a result of the generated traffic.

ANNEXURE A: PROPOSED PLANS
(3 SHEETS)

PHASE LEGEND

- EXISTING TO BE RETAINED
- EXISTING FOR DEMOLITION
- PROPOSED WORKS

PROPOSED PARKING COUNT	
GROUND	123 + 6 PICK UP
BASEMENT 1	175
BASEMENT 2	201



1 DA GENERAL ARRANGEMENT LEVEL B2
1 : 250

FOR COORDINATION ONLY
12/10/21

12/10/2021 8:03:36 PM C:\REVIT LOCAL 2021\11993_FSC_AR_ARCH_PhillipJUTEZY.rvt

Client

REVELOP

Issue	Description	Date
P3	Issued for cilents review	12/10/2021
P2	Issued for coordination	08/10/2021
P1	Issued for coordination	24/09/2021

Builder

Project Name
FORESTWAY SHOPPING CENTRE

Project Address
22 Forest Way Frenchs Forest NSW

Key Plan
0 5000 12500

Drawing Title:
Proposed GA Plan (Basement 2)

Author:	Checker:	Sheet Size:	Scale:
PJ	DC	A0	1:250

Drawing Number: **11993_DA-111** Issue: **P3**

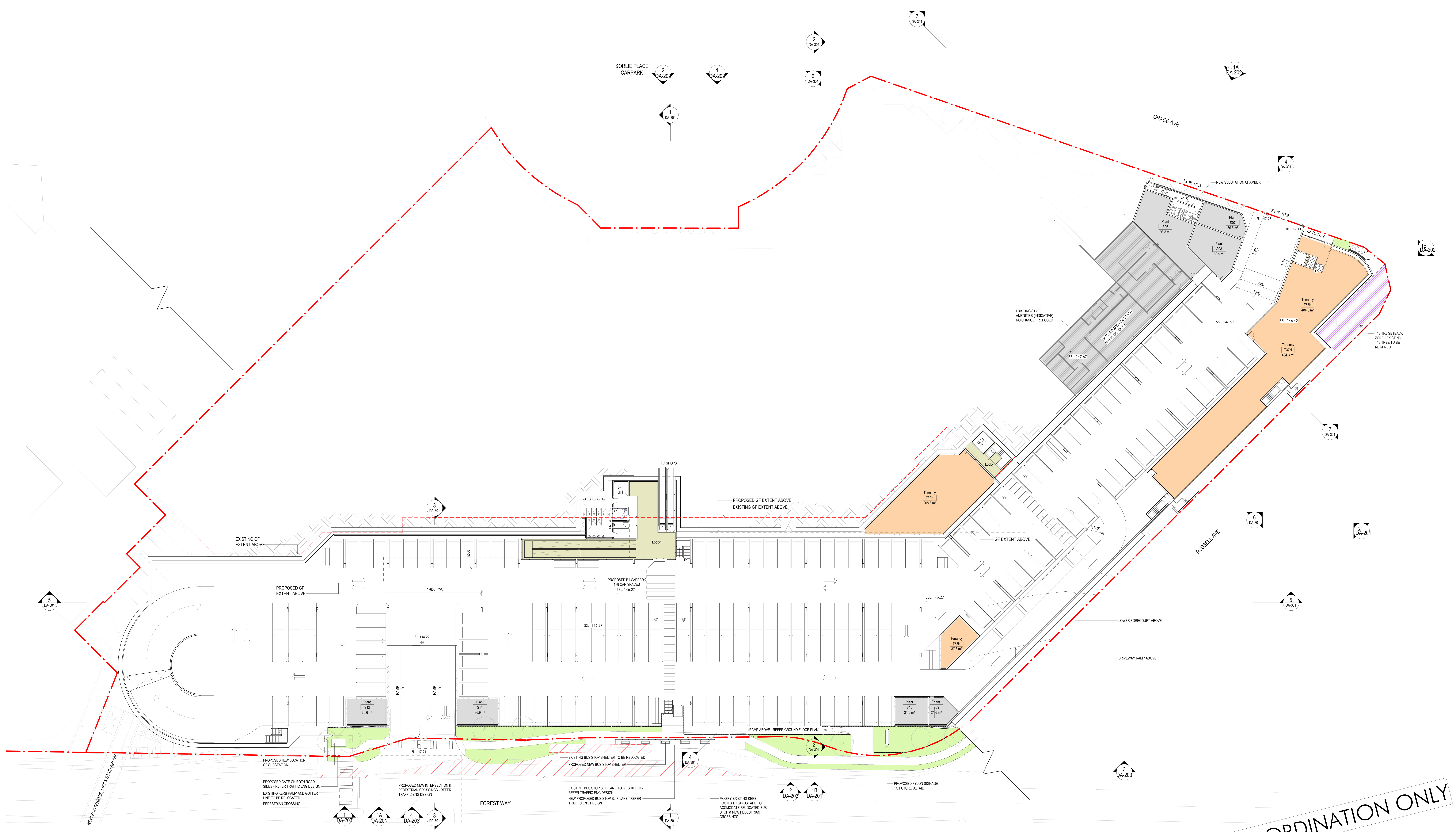
nettletontribe

nettleton tribe partnership pty ltd ABN 58 161 683 122
117 Willoughby Road, Crows Nest, NSW 2065
t +61 2 9431 6431
e: sydney@nettletontribe.com.au w: nettletontribe.com.au

PHASE LEGEND

- EXISTING TO BE RETAINED
- EXISTING FOR DEMOLITION
- PROPOSED WORKS

PROPOSED PARKING COUNT	
GROUND	120 + 6 PICK UP
BASEMENT 1	178
BASEMENT 2	201



FOR COORDINATION ONLY

1 DA GENERAL ARRANGEMENT LEVEL B1
1 : 250

Client
REVELOP

Issue	Description	Date
P5	FOR COORDINATION	07/08/2023
P4	FOR REVIEW	10/07/2023
P3	Issued for cilents review	12/10/2021
P2	Issued for coordination	08/10/2021
P1	Issued for coordination	24/09/2021

Project Name
FORESTWAY SHOPPING CENTRE

Project Address
22 Forest Way Frenchs Forest NSW

Key Plan
0 2000 5000

Drawing Title:
Proposed GA Plan (Basement 1)

Author:	Checker:	Sheet Size:	Scale:
PJ	DC	A0	1:250

Drawing Number: **11993_DA-113**
Issue: **P5**

nettletontribe
nettleton tribe partnership pty ltd ABN 58 161 683 122
117 Willoughby Road, Crows Nest, NSW 2065
t +61 2 9431 6431
e: sydney@nettletontribe.com.au w: nettletontribe.com.au

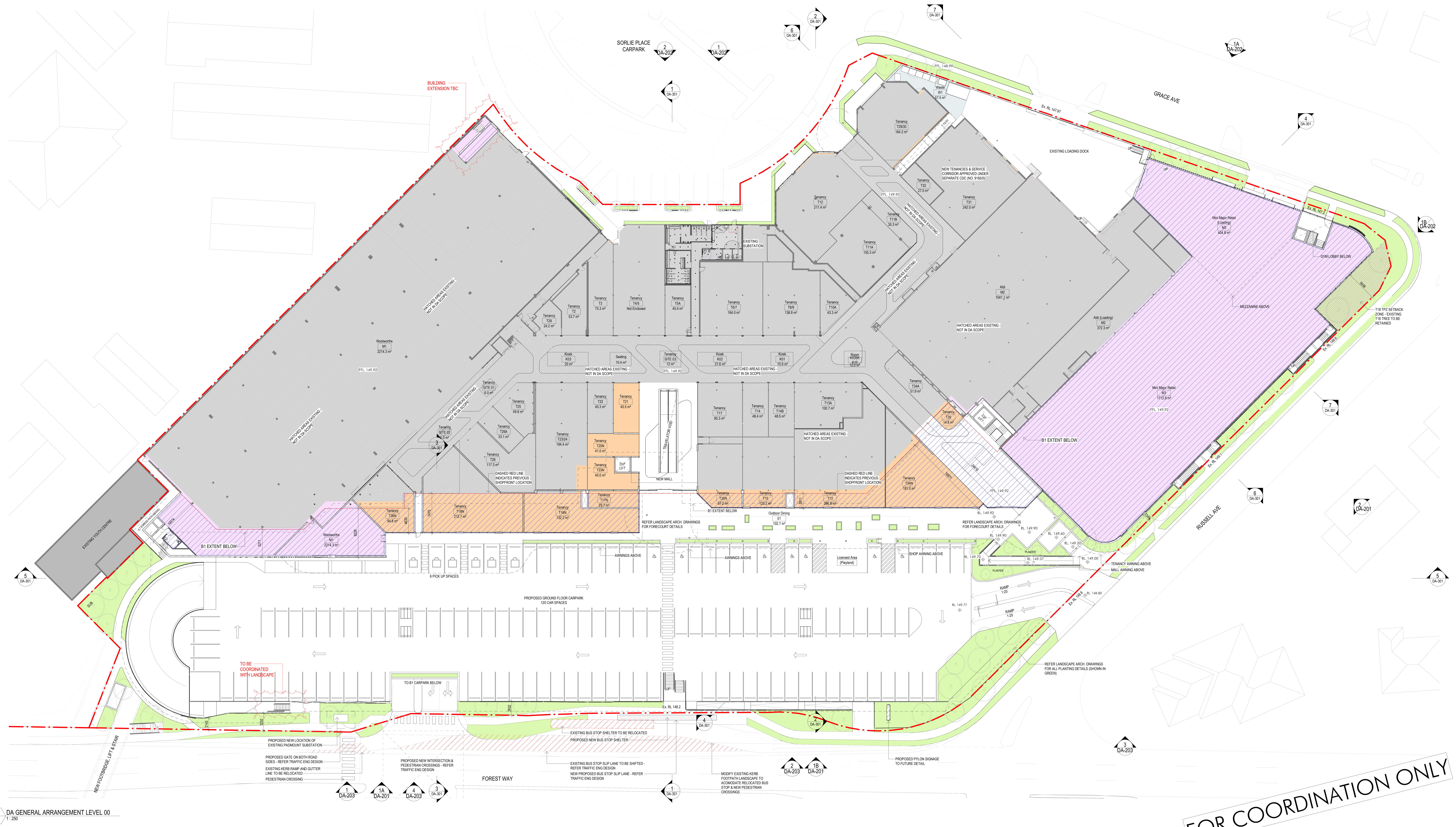
PHASE LEGEND

- EXISTING TO BE RETAINED
- EXISTING FOR DEMOLITION
- PROPOSED WORKS

PROPOSED PARKING COUNT

GROUND	120 + 6 PICK UP
BASEMENT 1	178
BASEMENT 2	201

PROPOSED RETAIL EXTENSION AREA
AREA = 3,177m²



1 DA GENERAL ARRANGEMENT LEVEL 00
1 : 250

FOR COORDINATION ONLY

Client

REVELOP

Issue	Description	Date
P5	FOR COORDINATION	07/08/2023
P4	FOR REVIEW	10/07/2023
P3	Issued for cilents review	12/10/2021
P2	Issued for coordination	08/10/2021
P1	Issued for coordination	24/09/2021

Project Name
FORESTWAY SHOPPING CENTRE

Project Address
22 Forest Way Frenchs Forest NSW

Key Plan

0 2000 5000

Drawing Title:
Proposed GA Plan (Ground Floor)

Author:	Checker:	Sheet Size:	Scale:
PJ	DC	A0	1:250

Drawing Number: **11993_DA-115**
Issue: **P5**

nettletontribe

nettleton tribe partnership pty ltd ABN 58 161 683 122
117 Willoughby Road, Crows Nest, NSW 2065
t +61 2 9431 6431
e: sydney@nettletontribe.com.au w: nettletontribe.com.au

ANNEXURE B: TRAFFIC SURVEY DATA
(14 SHEETS)

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Grace Ave and Russell Ave, Frenchs Fores

GPS -33.749315,151.223243

Date:	Thu 10/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Grace Ave
East:	Russell Ave
South:	Grace Ave
West:	N/A

Survey	AM:	7:00 AM-9:30 AM
Period	PM:	2:30 PM-6:30 PM
Traffic	AM:	8:15 AM-9:15 AM
Peak	PM:	3:30 PM-4:30 PM

All Vehicles

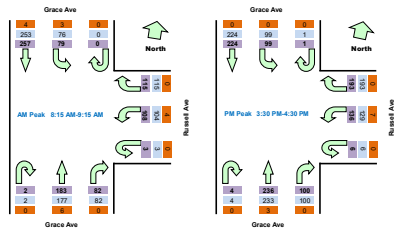
Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
7:00	7:15	0	26	13	0	13	5	0	4	14	520	
7:15	7:30	0	22	12	2	17	10	2	15	15	616	
7:30	7:45	0	35	46	0	27	19	0	10	32	690	
7:45	8:00	1	38	42	0	25	18	0	19	38	710	
8:00	8:15	0	45	33	0	21	17	0	19	36	781	
8:15	8:30	0	49	20	0	23	11	0	17	49	829	Peak
8:30	8:45	0	44	26	0	30	30	0	22	37	819	
8:45	9:00	0	94	17	3	35	26	0	24	53	630	
9:00	9:15	0	70	16	0	27	41	2	19	44	378	
9:15	9:30	0	47	16	1	24	27	0	18	26	159	
14:30	14:45	0	45	14	0	33	30	1	12	37	804	
14:45	15:00	0	45	16	0	34	38	2	20	34	896	
15:00	15:15	0	51	13	1	37	40	1	14	52	944	
15:15	15:30	0	65	17	2	37	33	2	23	55	998	
15:30	15:45	1	47	31	3	50	40	0	37	55	999	Peak
15:45	16:00	0	48	29	2	48	30	1	25	54	938	
16:00	16:15	0	70	25	1	39	39	3	16	70	917	
16:15	16:30	0	59	14	0	56	27	0	22	57	883	
16:30	16:45	0	35	20	1	55	39	0	14	39	871	
16:45	17:00	0	48	17	0	49	37	0	11	54	905	
17:00	17:15	0	46	19	2	54	35	1	17	55	894	
17:15	17:30	0	48	6	0	56	38	0	13	62	840	
17:30	17:45	1	46	15	1	48	36	1	31	58	807	
17:45	18:00	2	38	15	0	49	26	1	22	52	570	
18:00	18:15	0	39	17	1	43	24	0	15	36	365	
18:15	18:30	0	37	12	0	43	26	0	18	54	190	

Peak Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
8:15	9:15	0	257	79	3	115	108	2	82	183	829
15:30	16:30	1	224	99	6	193	136	4	100	236	999

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
7:00	7:15	0	26	12	0	13	5	0	4	14
7:15	7:30	0	22	12	2	17	10	2	15	15
7:30	7:45	0	34	46	0	27	17	0	10	30
7:45	8:00	1	38	42	0	25	15	0	19	37
8:00	8:15	0	44	32	0	21	16	0	19	35
8:15	8:30	0	48	20	0	23	10	0	17	46
8:30	8:45	0	44	26	0	30	30	0	22	36
8:45	9:00	0	91	14	3	35	26	0	24	52
9:00	9:15	0	70	16	0	27	38	2	19	43
9:15	9:30	0	47	16	1	24	20	0	18	26
14:30	14:45	0	45	14	0	33	30	1	12	37
14:45	15:00	0	45	16	0	34	38	2	20	33
15:00	15:15	0	50	13	1	37	39	1	14	52
15:15	15:30	0	65	17	2	37	30	2	23	54
15:30	15:45	1	47	31	3	50	37	0	37	53
15:45	16:00	0	48	29	2	48	27	1	25	54
16:00	16:15	0	70	25	1	39	39	3	16	69
16:15	16:30	0	59	14	0	56	26	0	22	57
16:30	16:45	0	35	20	1	55	39	0	14	38
16:45	17:00	0	48	17	0	49	35	0	11	53
17:00	17:15	0	45	19	2	54	35	1	17	55
17:15	17:30	0	48	6	0	56	36	0	13	62
17:30	17:45	1	45	15	1	48	35	1	31	57
17:45	18:00	2	38	15	0	49	26	1	22	52
18:00	18:15	0	38	17	1	43	24	0	15	36
18:15	18:30	0	37	12	0	43	26	0	18	54

Peak Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
8:15	9:15	0	253	76	3	115	104	2	82	177	812
15:30	16:30	1	224	99	6	193	129	4	100	233	989

Heavy Vehicles

Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
7:00	7:15	0	0	1	0	0	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0	0	0
7:30	7:45	0	1	0	0	0	2	0	0	2
7:45	8:00	0	0	0	0	0	3	0	0	1
8:00	8:15	0	1	1	0	0	1	0	0	1
8:15	8:30	0	1	0	0	0	1	0	0	3
8:30	8:45	0	0	0	0	0	0	0	0	1
8:45	9:00	0	3	3	0	0	0	0	0	1
9:00	9:15	0	0	0	0	0	3	0	0	1
9:15	9:30	0	0	0	0	0	7	0	0	0
14:30	14:45	0	0	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	0	0	1
15:00	15:15	0	1	0	0	0	1	0	0	0
15:15	15:30	0	0	0	0	0	3	0	0	1
15:30	15:45	0	0	0	0	0	3	0	0	2
15:45	16:00	0	0	0	0	0	3	0	0	0
16:00	16:15	0	0	0	0	0	0	0	0	1
16:15	16:30	0	0	0	0	0	1	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	1
16:45	17:00	0	0	0	0	0	2	0	0	1
17:00	17:15	0	1	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	2	0	0	0
17:30	17:45	0	1	0	0	0	1	0	0	1
17:45	18:00	0	0	0	0	0	0	0	0	0
18:00	18:15	0	1	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
8:15	9:15	0	4	3	0	0	4	0	0	6	17
15:30	16:30	0	0	0	0	0	7	0	0	3	10

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Grace Ave and Russell Ave, Frenchs Fore

GPS -33.749315,151.223243

Date:	Sat 12/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Grace Ave
East:	Russell Ave
South:	Grace Ave
West:	N/A

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-2:00 PM
Traffic Peak	AM:	11:00 AM-12:00 PM
	PM:	12:15 PM-1:15 PM

All Vehicles

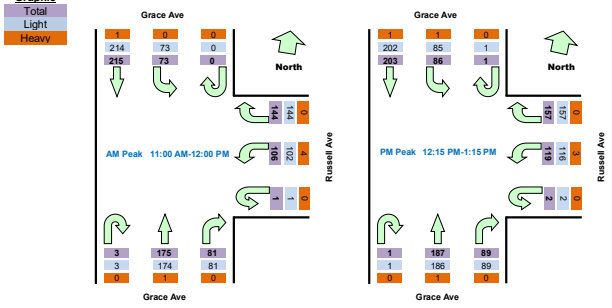
Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
10:00	10:15	0	47	14	0	38	19	0	13	34	720	
10:15	10:30	1	47	15	0	33	22	0	14	33	748	
10:30	10:45	0	62	24	0	33	25	1	23	26	776	
10:45	11:00	0	46	22	2	38	29	0	14	45	782	
11:00	11:15	0	54	19	0	39	25	0	15	41	798	Peak
11:15	11:30	0	61	22	1	26	21	0	21	41		
11:30	11:45	0	57	16	0	42	25	0	19	41		
11:45	12:00	0	43	16	0	37	35	3	26	52		
12:00	12:15	0	61	22	0	27	35	2	26	42	842	
12:15	12:30	1	47	21	1	47	34	0	26	46	845	Peak
12:30	12:45	0	55	19	0	32	25	1	20	49	818	
12:45	13:00	0	46	22	1	39	34	0	19	42	813	
13:00	13:15	0	55	24	0	39	26	0	24	50	785	
13:15	13:30	0	42	9	0	37	43	3	26	36	567	
13:30	13:45	0	45	18	0	43	38	1	18	33	371	
13:45	14:00	0	39	15	0	32	27	3	22	37	175	

Peak Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
11:00	12:00	0	215	73	1	144	106	3	81	175	798
12:15	13:15	1	203	86	2	157	119	1	89	187	845

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
10:00	10:15	0	47	14	0	38	18	0	13	34
10:15	10:30	1	45	15	0	33	22	0	14	33
10:30	10:45	0	62	24	0	33	24	1	23	26
10:45	11:00	0	46	22	2	38	28	0	14	45
11:00	11:15	0	54	19	0	39	23	0	15	41
11:15	11:30	0	60	22	1	26	21	0	21	41
11:30	11:45	0	57	16	0	42	25	0	19	40
11:45	12:00	0	43	16	0	37	33	3	26	52
12:00	12:15	0	61	21	0	27	35	2	26	42
12:15	12:30	1	47	21	1	47	33	0	26	46
12:30	12:45	0	54	18	0	32	23	1	20	49
12:45	13:00	0	46	22	1	39	34	0	19	41
13:00	13:15	0	55	24	0	39	26	0	24	50
13:15	13:30	0	42	9	0	37	41	3	26	35
13:30	13:45	0	45	18	0	43	37	1	18	33
13:45	14:00	0	39	15	0	32	26	3	22	36

Peak Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
11:00	12:00	0	214	73	1	144	102	3	81	174	792
12:15	13:15	1	202	85	2	157	116	1	89	186	839

Heavy Vehicles

Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
10:00	10:15	0	0	0	0	0	1	0	0	0
10:15	10:30	0	2	0	0	0	0	0	0	0
10:30	10:45	0	0	0	0	0	1	0	0	0
10:45	11:00	0	0	0	0	0	1	0	0	0
11:00	11:15	0	0	0	0	0	2	0	0	0
11:15	11:30	0	1	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0	0	1
11:45	12:00	0	0	0	0	0	2	0	0	0
12:00	12:15	0	0	1	0	0	0	0	0	0
12:15	12:30	0	0	0	0	0	1	0	0	0
12:30	12:45	0	1	1	0	0	2	0	0	0
12:45	13:00	0	0	0	0	0	0	0	0	1
13:00	13:15	0	0	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	2	0	0	1
13:30	13:45	0	0	0	0	0	1	0	0	0
13:45	14:00	0	0	0	0	0	1	0	0	1

Peak Time		North Approach Grace Ave			East Approach Russell Ave			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
11:00	12:00	0	1	0	0	0	4	0	0	1	6
12:15	13:15	0	1	1	0	0	3	0	0	1	6

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Grace Ave and Shopping Centre Driveway,

GPS -33.749658,151.223366

Date:	Thu 10/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Grace Ave
East:	Shopping Centre Driveway
South:	Grace Ave
West:	N/A

Survey	AM:	7:00 AM-9:30 AM
Period	PM:	2:30 PM-6:30 PM
Traffic	AM:	8:15 AM-9:15 AM
Peak	PM:	3:15 PM-4:15 PM

All Vehicles

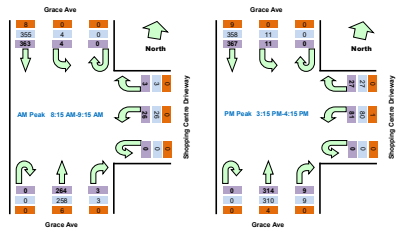
Time		North Approach Grace Ave			proach Shopping Centre D			South Approach Grace Ave			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
7:00	7:15	0	31	0	0	0	4	0	1	18	357	
7:15	7:30	0	34	0	0	0	2	0	1	32	432	
7:30	7:45	0	53	1	0	0	8	0	1	42	496	
7:45	8:00	0	55	1	0	2	14	0	2	55	528	
8:00	8:15	0	62	0	0	4	10	0	2	51	609	
8:15	8:30	0	59	1	0	1	5	0	2	65	663	Peak
8:30	8:45	0	73	1	0	1	4	0	0	58	651	
8:45	9:00	0	120	0	0	1	12	0	1	76	514	
9:00	9:15	0	111	2	0	0	5	0	0	65	304	
9:15	9:30	0	71	3	0	1	1	0	2	43	121	
14:30	14:45	0	70	6	0	3	22	0	4	47	698	
14:45	15:00	0	84	1	0	2	26	0	2	54	745	
15:00	15:15	0	90	2	0	5	6	0	8	62	758	
15:15	15:30	0	97	3	0	3	20	0	4	77	809	Peak
15:30	15:45	0	86	1	0	8	18	0	2	84	795	
15:45	16:00	0	77	2	0	8	21	0	2	72	746	
16:00	16:15	0	107	5	0	8	22	0	1	81	733	
16:15	16:30	0	81	5	0	4	22	0	3	75	677	
16:30	16:45	0	68	6	0	2	19	0	4	51	675	
16:45	17:00	0	75	10	0	7	16	0	3	58	717	
17:00	17:15	0	79	3	0	3	9	0	4	70	707	
17:15	17:30	0	85	1	0	4	17	0	10	71	673	
17:30	17:45	0	78	5	0	4	18	0	1	86	632	
17:45	18:00	0	62	3	0	4	18	0	1	71	440	
18:00	18:15	0	60	3	0	1	17	0	3	50	281	
18:15	18:30	0	59	4	0	2	6	0	6	70	147	

Peak Time		North Approach Grace Ave			proach Shopping Centre D			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
8:15	9:15	0	363	4	0	3	26	0	3	264	663
15:15	16:15	0	367	11	0	27	81	0	9	314	809

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Grace Ave			proach Shopping Centre D			South Approach Grace Ave		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
7:00	7:15	0	31	0	0	0	4	0	1	18
7:15	7:30	0	34	0	0	0	2	0	1	32
7:30	7:45	0	50	1	0	0	8	0	1	40
7:45	8:00	0	52	1	0	2	14	0	2	54
8:00	8:15	0	60	0	0	4	10	0	2	50
8:15	8:30	0	57	1	0	1	5	0	2	62
8:30	8:45	0	73	1	0	1	4	0	0	57
8:45	9:00	0	117	0	0	1	12	0	1	75
9:00	9:15	0	108	2	0	0	5	0	0	64
9:15	9:30	0	65	2	0	1	1	0	2	43
14:30	14:45	0	70	6	0	3	22	0	4	47
14:45	15:00	0	84	1	0	2	26	0	2	53
15:00	15:15	0	88	2	0	5	6	0	8	62
15:15	15:30	0	94	3	0	3	20	0	4	76
15:30	15:45	0	83	1	0	8	18	0	2	82
15:45	16:00	0	74	2	0	8	20	0	2	72
16:00	16:15	0	107	5	0	8	22	0	1	80
16:15	16:30	0	80	5	0	4	22	0	3	75
16:30	16:45	0	68	6	0	2	19	0	4	50
16:45	17:00	0	73	10	0	7	16	0	3	57
17:00	17:15	0	78	3	0	3	9	0	4	70
17:15	17:30	0	83	1	0	4	17	0	10	71
17:30	17:45	0	76	5	0	4	18	0	1	85
17:45	18:00	0	62	3	0	4	18	0	1	71
18:00	18:15	0	59	3	0	1	17	0	3	50
18:15	18:30	0	59	4	0	2	6	0	6	70

Peak Time		North Approach Grace Ave			proach Shopping Centre D			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
8:15	9:15	0	355	4	0	3	26	0	3	258	649
15:15	16:15	0	358	11	0	27	80	0	9	310	795

Heavy Vehicles

Time		North Approach Grace Ave			proach Shopping Centre D			South Approach Grace Ave		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
7:00	7:15	0	0	0	0	0	0	0	0	0
7:15	7:30	0	0	0	0	0	0	0	0	0
7:30	7:45	0	3	0	0	0	0	0	0	2
7:45	8:00	0	3	0	0	0	0	0	0	1
8:00	8:15	0	2	0	0	0	0	0	0	1
8:15	8:30	0	2	0	0	0	0	0	0	3
8:30	8:45	0	0	0	0	0	0	0	0	1
8:45	9:00	0	3	0	0	0	0	0	0	1
9:00	9:15	0	3	0	0	0	0	0	0	1
9:15	9:30	0	6	1	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	0	0	0
14:45	15:00	0	0	0	0	0	0	0	0	1
15:00	15:15	0	2	0	0	0	0	0	0	0
15:15	15:30	0	3	0	0	0	0	0	0	1
15:30	15:45	0	3	0	0	0	0	0	0	2
15:45	16:00	0	3	0	0	0	1	0	0	0
16:00	16:15	0	0	0	0	0	0	0	0	1
16:15	16:30	0	1	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0	0	1
16:45	17:00	0	2	0	0	0	0	0	0	1
17:00	17:15	0	1	0	0	0	0	0	0	0
17:15	17:30	0	2	0	0	0	0	0	0	0
17:30	17:45	0	2	0	0	0	0	0	0	1
17:45	18:00	0	0	0	0	0	0	0	0	0
18:00	18:15	0	1	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0

Peak Time		North Approach Grace Ave			proach Shopping Centre D			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
8:15	9:15	0	8	0	0	0	0	0	0	6	14
15:15	16:15	0	9	0	0	0	1	0	0	4	14

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Grace Ave and Shopping Centre Driveway

GPS *-33.749658,151.223366*

Date:	Sat 12/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Grace Ave
East:	Shopping Centre Driveway
South:	Grace Ave
West:	N/A

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-2:00 PM
Traffic Peak	AM:	11:45 AM-12:45 PM
	PM:	12:00 PM-1:00 PM

All Vehicles

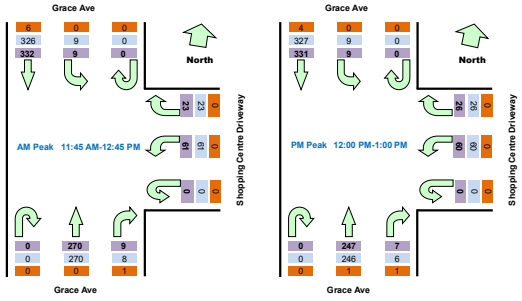
Time		North Approach Grace Ave			pproach Shopping Centre D			South Approach Grace Ave			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
10:00	10:15	0	65	1	0	1	17	0	2	46	594	
10:15	10:30	0	67	2	0	2	14	0	3	45	626	
10:30	10:45	0	87	1	0	3	24	0	2	47	653	
10:45	11:00	0	73	2	0	3	28	0	3	56	648	
11:00	11:15	0	74	5	0	4	27	0	2	52	667	
11:15	11:30	0	81	1	0	6	14	0	2	56	694	
11:30	11:45	0	79	3	0	7	11	0	6	53	697	
11:45	12:00	0	79	2	0	6	20	0	2	75	704	Peak
12:00	12:15	0	96	2	0	4	20	0	3	66	680	
12:15	12:30	0	80	1	0	6	8	0	2	66	666	
12:30	12:45	0	77	4	0	7	13	0	2	63	678	
12:45	13:00	0	78	2	0	9	19	0	0	52	668	
13:00	13:15	0	76	5	0	7	21	0	1	67	657	
13:15	13:30	0	84	4	0	5	19	0	3	60		
13:30	13:45	0	83	1	0	7	16	0	4	45		
13:45	14:00	0	63	6	0	4	15	0	3	58		

Peak Time		North Approach Grace Ave			pproach Shopping Centre D			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
11:45	12:45	0	332	9	0	23	61	0	9	270	704
12:00	13:00	0	331	9	0	26	60	0	7	247	680

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Grace Ave			pproach Shopping Centre D			South Approach Grace Ave		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
10:00	10:15	0	64	1	0	1	17	0	2	46
10:15	10:30	0	65	2	0	2	14	0	3	45
10:30	10:45	0	86	1	0	3	24	0	2	47
10:45	11:00	0	72	2	0	3	28	0	3	56
11:00	11:15	0	72	5	0	4	27	0	2	52
11:15	11:30	0	80	1	0	6	14	0	2	56
11:30	11:45	0	79	3	0	7	11	0	6	52
11:45	12:00	0	77	2	0	6	20	0	2	75
12:00	12:15	0	96	2	0	4	20	0	2	66
12:15	12:30	0	79	1	0	6	8	0	2	66
12:30	12:45	0	74	4	0	7	13	0	2	63
12:45	13:00	0	78	2	0	9	19	0	0	51
13:00	13:15	0	76	5	0	7	21	0	1	67
13:15	13:30	0	82	4	0	5	19	0	3	59
13:30	13:45	0	82	1	0	7	16	0	4	45
13:45	14:00	0	62	6	0	4	15	0	3	57

Peak Time		North Approach Grace Ave			pproach Shopping Centre D			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
11:45	12:45	0	326	9	0	23	61	0	8	270	697
12:00	13:00	0	327	9	0	26	60	0	6	246	674

Heavy Vehicles

Time		North Approach Grace Ave			pproach Shopping Centre D			South Approach Grace Ave		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
10:00	10:15	0	1	0	0	0	0	0	0	0
10:15	10:30	0	2	0	0	0	0	0	0	0
10:30	10:45	0	1	0	0	0	0	0	0	0
10:45	11:00	0	1	0	0	0	0	0	0	0
11:00	11:15	0	2	0	0	0	0	0	0	0
11:15	11:30	0	1	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0	0	1
11:45	12:00	0	2	0	0	0	0	0	0	0
12:00	12:15	0	0	0	0	0	0	0	1	0
12:15	12:30	0	1	0	0	0	0	0	0	0
12:30	12:45	0	3	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0	0	1
13:00	13:15	0	0	0	0	0	0	0	0	0
13:15	13:30	0	2	0	0	0	0	0	0	1
13:30	13:45	0	1	0	0	0	0	0	0	0
13:45	14:00	0	1	0	0	0	0	0	0	1

Peak Time		North Approach Grace Ave			pproach Shopping Centre D			South Approach Grace Ave			Peak
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	total
11:45	12:45	0	6	0	0	0	0	0	1	0	7
12:00	13:00	0	4	0	0	0	0	0	1	1	6

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Russell Ave and Forest Way, Frenchs Fore

GPS -33.749417,151.224822

Date:	Thu 10/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Forest Way
East:	N/A
South:	Forest Way
West:	Russell Ave

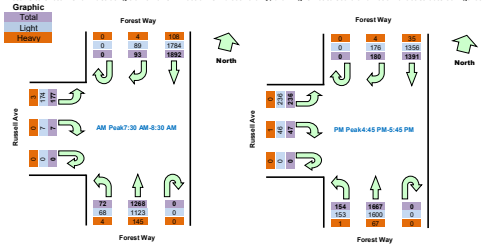
Survey	AM:	7:00 AM-8:30 AM
Period	PM:	2:30 PM-6:30 PM
Traffic	AM:	7:30 AM-8:30 AM
Peak	PM:	4:45 PM-5:45 PM

All Vehicles

Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
7:00	7:15	0	6	422	0	218	16	0	0	17	3200	
7:15	7:30	0	19	439	0	248	12	0	1	32	3396	
7:30	7:45	0	24	492	0	265	18	0	5	38	3509	Peak
7:45	8:00	0	23	484	0	356	19	0	1	45	3509	Peak
8:00	8:15	0	22	439	0	349	18	0	1	46	3359	
8:15	8:30	0	24	477	0	298	17	0	0	48	3258	
8:30	8:45	0	37	439	0	284	27	0	3	52	3195	
8:45	9:00	0	39	370	0	292	29	0	3	45	2353	
9:00	9:15	0	45	393	0	256	28	0	2	50	1575	
9:15	9:30	0	38	365	0	325	21	0	2	50	801	
14:30	14:45	0	33	285	0	346	29	0	14	41	3370	
14:45	15:00	0	51	335	0	382	27	0	9	49	3478	
15:00	15:15	0	54	338	0	385	38	0	11	59	3525	
15:15	15:30	0	47	381	0	365	31	0	11	49	3513	
15:30	15:45	0	54	326	0	360	31	0	14	71	3489	
15:45	16:00	0	45	348	0	395	36	0	15	61	3466	
16:00	16:15	0	47	341	0	376	41	0	6	62	3469	
16:15	16:30	0	46	344	0	369	24	0	19	58	3454	
16:30	16:45	0	47	318	0	363	43	0	10	52	3585	
16:45	17:00	0	41	359	0	402	34	0	13	54	3675	Peak
17:00	17:15	0	50	306	0	384	37	0	16	65	3584	
17:15	17:30	0	46	376	0	466	45	0	8	50	3505	
17:30	17:45	0	43	350	0	415	38	0	10	67	3242	
17:45	18:00	0	29	294	0	379	36	0	20	54	2319	
18:00	18:15	0	44	307	0	334	27	0	17	50	1507	
18:15	18:30	0	30	251	0	348	32	0	14	53	728	

Peak Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
7:30	8:30	0	93	1892	0	1268	72	0	7	177	3509
16:45	17:45	0	180	1391	0	1667	154	0	47	236	3675

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.



Light Vehicles

Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
7:00	7:15	0	6	384	0	195	15	0	0	16
7:15	7:30	0	18	412	0	223	12	0	1	32
7:30	7:45	0	23	458	0	236	17	0	5	37
7:45	8:00	0	21	460	0	321	18	0	1	44
8:00	8:15	0	21	417	0	307	17	0	1	45
8:15	8:30	0	24	449	0	259	16	0	0	48
8:30	8:45	0	37	415	0	249	27	0	2	51
8:45	9:00	0	39	343	0	260	28	0	3	44
9:00	9:15	0	41	361	0	219	26	0	2	49
9:15	9:30	0	36	333	0	285	17	0	2	47
14:30	14:45	0	32	271	0	313	29	0	14	39
14:45	15:00	0	51	318	0	358	27	0	8	49
15:00	15:15	0	54	310	0	350	36	0	11	59
15:15	15:30	0	45	362	0	331	31	0	11	48
15:30	15:45	0	52	310	0	333	31	0	14	70
15:45	16:00	0	44	329	0	363	33	0	15	61
16:00	16:15	0	47	322	0	349	40	0	6	62
16:15	16:30	0	45	329	0	342	24	0	19	57
16:30	16:45	0	47	307	0	340	43	0	10	51
16:45	17:00	0	39	350	0	378	34	0	13	54
17:00	17:15	0	50	301	0	368	37	0	16	65
17:15	17:30	0	45	364	0	449	44	0	8	50
17:30	17:45	0	42	341	0	405	38	0	9	67
17:45	18:00	0	29	285	0	367	36	0	20	53
18:00	18:15	0	44	299	0	323	27	0	17	50
18:15	18:30	0	30	246	0	330	32	0	14	53

Peak Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
7:30	8:30	0	89	1784	0	1123	68	0	7	174	3245
16:45	17:45	0	176	1356	0	1600	153	0	46	236	3567

Heavy Vehicles

Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
7:00	7:15	0	0	38	0	23	1	0	0	1
7:15	7:30	0	1	27	0	25	0	0	0	0
7:30	7:45	0	1	34	0	29	1	0	0	1
7:45	8:00	0	2	24	0	35	1	0	0	1
8:00	8:15	0	1	22	0	42	1	0	0	1
8:15	8:30	0	0	28	0	39	1	0	0	0
8:30	8:45	0	0	24	0	35	0	0	1	1
8:45	9:00	0	0	27	0	32	1	0	0	1
9:00	9:15	0	4	32	0	37	2	0	0	1
9:15	9:30	0	2	32	0	40	4	0	0	3
14:30	14:45	0	1	14	0	33	0	0	0	2
14:45	15:00	0	0	17	0	24	0	0	1	0
15:00	15:15	0	0	28	0	35	2	0	0	0
15:15	15:30	0	2	19	0	34	0	0	0	1
15:30	15:45	0	2	16	0	27	0	0	0	1
15:45	16:00	0	1	19	0	32	3	0	0	0
16:00	16:15	0	0	19	0	27	1	0	0	0
16:15	16:30	0	1	15	0	27	0	0	0	1
16:30	16:45	0	0	11	0	23	0	0	0	1
16:45	17:00	0	2	9	0	24	0	0	0	0
17:00	17:15	0	0	5	0	16	0	0	0	0
17:15	17:30	0	1	12	0	17	1	0	0	0
17:30	17:45	0	1	9	0	10	0	0	1	0
17:45	18:00	0	0	9	0	12	0	0	0	1
18:00	18:15	0	0	8	0	11	0	0	0	0
18:15	18:30	0	0	5	0	18	0	0	0	0

Peak Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
7:30	8:30	0	4	108	0	145	4	0	0	3	264
16:45	17:45	0	4	35	0	67	1	0	1	0	108

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au

Intersection of Russell Ave and Forest Way, Frenchs For

GPS -33.749417,151.224822

Date:	Sat 12/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Forest Way
East:	N/A
South:	Forest Way
West:	Russell Ave

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-2:00 PM
Traffic Peak	AM:	11:00 AM-12:00 PM
	PM:	12:15 PM-1:15 PM

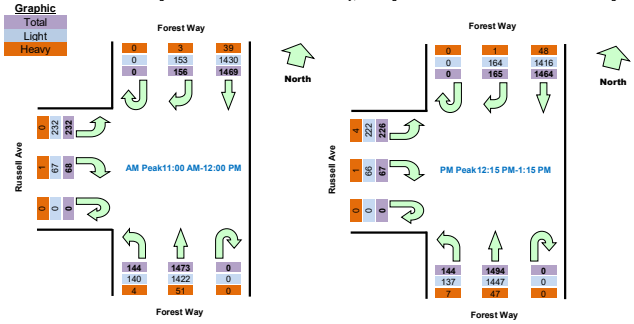
All Vehicles

Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
10:00	10:15	0	36	331	0	373	25	0	22	35	3361	
10:15	10:30	0	34	379	0	326	30	0	14	40	3413	
10:30	10:45	0	58	327	0	358	25	0	18	55	3466	
10:45	11:00	0	48	363	0	386	29	0	18	31	3493	
11:00	11:15	0	38	374	0	359	36	0	20	47	3542	Peak
11:15	11:30	0	35	353	0	366	22	0	16	84		
11:30	11:45	0	37	365	0	363	41	0	12	50		
11:45	12:00	0	46	377	0	385	45	0	20	51		
12:00	12:15	0	56	361	0	372	28	0	18	62	3542	
12:15	12:30	0	44	354	0	387	43	0	16	57	3560	Peak
12:30	12:45	0	35	379	0	356	34	0	11	54	3490	
12:45	13:00	0	40	349	0	376	34	0	22	54	3475	
13:00	13:15	0	46	382	0	375	33	0	18	61	3494	
13:15	13:30	0	51	334	1	341	30	0	13	61	2579	
13:30	13:45	0	43	378	0	331	33	0	16	53	1748	
13:45	14:00	0	42	358	0	379	27	0	22	66	894	

Peak Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
11:00	12:00	0	156	1469	0	1473	144	0	68	232	3542
12:15	13:15	0	165	1464	0	1494	144	0	67	226	3560

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic



Light Vehicles

Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
10:00	10:15	0	36	321	0	357	24	0	22	35
10:15	10:30	0	34	366	0	312	29	0	13	40
10:30	10:45	0	58	317	0	347	24	0	18	55
10:45	11:00	0	47	354	0	370	29	0	18	31
11:00	11:15	0	38	358	0	343	33	0	20	47
11:15	11:30	0	35	345	0	357	21	0	16	84
11:30	11:45	0	37	359	0	352	41	0	12	50
11:45	12:00	0	43	368	0	370	45	0	19	51
12:00	12:15	0	56	351	0	363	28	0	18	61
12:15	12:30	0	44	343	0	372	40	0	15	57
12:30	12:45	0	35	370	0	348	32	0	11	52
12:45	13:00	0	40	335	0	368	34	0	22	53
13:00	13:15	0	45	368	0	359	31	0	18	60
13:15	13:30	0	51	326	1	329	28	0	13	60
13:30	13:45	0	42	368	0	317	33	0	15	52
13:45	14:00	0	41	346	0	366	27	0	22	65

Peak Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
11:00	12:00	0	153	1430	0	1422	140	0	67	232	3444
12:15	13:15	0	164	1416	0	1447	137	0	66	222	3452

Heavy Vehicles

Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave		
Period Start	Period End	U	R	SB	U	NB	L	U	R	L
10:00	10:15	0	0	10	0	16	1	0	0	0
10:15	10:30	0	0	13	0	14	1	0	1	0
10:30	10:45	0	0	10	0	11	1	0	0	0
10:45	11:00	0	1	9	0	16	0	0	0	0
11:00	11:15	0	0	16	0	16	3	0	0	0
11:15	11:30	0	0	8	0	9	1	0	0	0
11:30	11:45	0	0	6	0	11	0	0	0	0
11:45	12:00	0	3	9	0	15	0	0	1	0
12:00	12:15	0	0	10	0	9	0	0	0	1
12:15	12:30	0	0	11	0	15	3	0	1	0
12:30	12:45	0	0	9	0	8	2	0	0	2
12:45	13:00	0	0	14	0	8	0	0	0	1
13:00	13:15	0	1	14	0	16	2	0	0	1
13:15	13:30	0	0	8	0	12	2	0	0	1
13:30	13:45	0	1	10	0	14	0	0	1	1
13:45	14:00	0	1	12	0	13	0	0	0	1

Peak Time		North Approach Forest Way			South Approach Forest Way			West Approach Russell Ave			Peak
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	total
11:00	12:00	0	3	39	0	51	4	0	1	0	98
12:15	13:15	0	1	48	0	47	7	0	1	4	108

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Russell Ave and Shopping Centre Driveway

GPS	-33.749423,151.224293
Date:	Thu 10/08/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	N/A
East:	Russell Ave
South:	Shopping Centre Driveway
West:	Russell Ave

Survey Period	AM:	7:00 AM-9:30 AM
	PM:	2:30 PM-6:30 PM
Traffic Peak	AM:	8:30 AM-9:30 AM
	PM:	3:30 PM-4:30 PM

All Vehicles

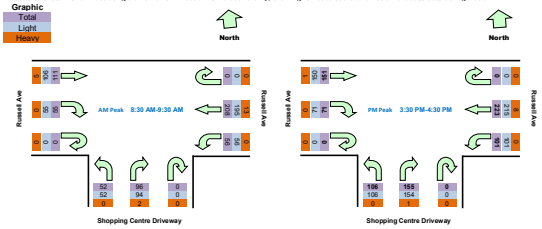
Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
7:00	7:15	0	17	5	0	8	1	0	7	9	396	
7:15	7:30	0	20	11	0	15	13	0	10	18	475	
7:30	7:45	0	27	15	0	24	16	0	24	19	501	
7:45	8:00	0	29	13	0	24	17	0	32	22	521	
8:00	8:15	0	28	12	0	18	17	0	22	29	530	
8:15	8:30	0	24	17	0	24	11	0	13	24	552	
8:30	8:45	0	53	11	0	18	12	0	14	37	578	Peak
8:45	9:00	0	53	15	0	24	16	0	14	24	433	
9:00	9:15	0	56	17	0	28	11	0	12	24	287	
9:15	9:30	0	46	13	0	26	13	0	15	26	139	
14:30	14:45	0	41	21	0	35	15	0	6	20	652	
14:45	15:00	0	60	18	0	31	14	0	10	27	735	
15:00	15:15	0	64	28	0	51	14	0	6	19	777	
15:15	15:30	0	53	25	0	34	18	0	16	26	790	
15:30	15:45	0	64	21	0	33	27	0	24	52	807	Peak
15:45	16:00	0	57	24	0	39	21	0	24	37	773	
16:00	16:15	0	60	28	0	41	22	0	17	27	743	
16:15	16:30	0	42	28	0	42	36	0	6	35	753	
16:30	16:45	0	68	22	0	41	22	0	13	21	739	
16:45	17:00	0	61	14	0	44	18	0	12	23	735	
17:00	17:15	0	58	29	0	48	23	0	14	33	730	
17:15	17:30	0	69	22	0	40	23	0	3	18	690	
17:30	17:45	0	62	19	0	38	13	0	12	39	670	
17:45	18:00	0	48	17	0	38	17	0	11	36	487	
18:00	18:15	0	46	25	0	41	17	0	10	26	320	
18:15	18:30	0	20	42	0	42	20	0	6	25	155	

Peak Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
8:30	9:30	0	208	56	0	96	52	0	55	111	578
15:30	16:30	0	223	101	0	155	106	0	71	151	807

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
7:00	7:15	0	16	5	0	8	1	0	7	8
7:15	7:30	0	19	11	0	15	13	0	10	18
7:30	7:45	0	25	15	0	24	16	0	24	18
7:45	8:00	0	26	13	0	24	17	0	32	21
8:00	8:15	0	26	12	0	18	17	0	22	28
8:15	8:30	0	23	17	0	24	11	0	13	24
8:30	8:45	0	53	11	0	17	12	0	14	36
8:45	9:00	0	52	15	0	23	16	0	14	24
9:00	9:15	0	50	17	0	28	11	0	12	23
9:15	9:30	0	40	13	0	26	13	0	15	23
14:30	14:45	0	40	21	0	34	15	0	6	19
14:45	15:00	0	60	18	0	31	14	0	10	26
15:00	15:15	0	62	28	0	51	14	0	6	19
15:15	15:30	0	51	25	0	34	18	0	16	25
15:30	15:45	0	62	21	0	33	27	0	24	51
15:45	16:00	0	53	24	0	39	21	0	24	37
16:00	16:15	0	59	28	0	41	22	0	17	27
16:15	16:30	0	41	28	0	41	36	0	6	35
16:30	16:45	0	68	22	0	40	22	0	13	21
16:45	17:00	0	59	14	0	44	18	0	12	23
17:00	17:15	0	58	29	0	48	23	0	14	33
17:15	17:30	0	67	22	0	40	23	0	3	18
17:30	17:45	0	61	19	0	38	13	0	12	38
17:45	18:00	0	48	17	0	38	17	0	11	35
18:00	18:15	0	46	25	0	41	17	0	10	26
18:15	18:30	0	20	42	0	42	20	0	6	25

Peak Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
8:30	9:30	0	195	56	0	94	52	0	55	106	558
15:30	16:30	0	215	101	0	154	106	0	71	150	797

Heavy Vehicles

Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
7:00	7:15	0	1	0	0	0	0	0	0	1
7:15	7:30	0	1	0	0	0	0	0	0	0
7:30	7:45	0	2	0	0	0	0	0	0	1
7:45	8:00	0	3	0	0	0	0	0	0	1
8:00	8:15	0	2	0	0	0	0	0	0	1
8:15	8:30	0	1	0	0	0	0	0	0	0
8:30	8:45	0	0	0	0	1	0	0	0	1
8:45	9:00	0	1	0	0	1	0	0	0	0
9:00	9:15	0	6	0	0	0	0	0	0	1
9:15	9:30	0	6	0	0	0	0	0	0	3
14:30	14:45	0	1	0	0	1	0	0	0	1
14:45	15:00	0	0	0	0	0	0	0	0	1
15:00	15:15	0	2	0	0	0	0	0	0	0
15:15	15:30	0	2	0	0	0	0	0	0	1
15:30	15:45	0	2	0	0	0	0	0	0	1
15:45	16:00	0	4	0	0	0	0	0	0	0
16:00	16:15	0	1	0	0	0	0	0	0	0
16:15	16:30	0	1	0	0	1	0	0	0	0
16:30	16:45	0	0	0	0	1	0	0	0	0
16:45	17:00	0	2	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0	0	0
17:15	17:30	0	2	0	0	0	0	0	0	0
17:30	17:45	0	1	0	0	0	0	0	0	1
17:45	18:00	0	0	0	0	0	0	0	0	1
18:00	18:15	0	0	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0	0	0

Peak Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
8:30	9:30	0	13	0	0	2	0	0	0	5	20
15:30	16:30	0	8	0	0	1	0	0	0	1	10

TRANS TRAFFIC SURVEY
trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Russell Ave and Shopping Centre Driveway

GPS -33.749423,151.224293

Date:	Sat 12/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	N/A
East:	Russell Ave
South:	Shopping Centre Driveway
West:	Russell Ave

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-2:00 PM
Traffic Peak	AM:	11:00 AM-12:00 PM
	PM:	12:45 PM-1:45 PM

All Vehicles

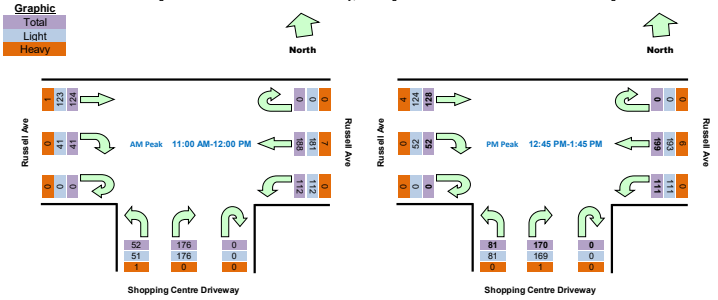
Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
10:00	10:15	0	38	23	0	36	11	0	8	21	622	
10:15	10:30	0	38	26	0	32	18	0	7	22	656	
10:30	10:45	0	45	38	0	37	18	0	14	36	688	
10:45	11:00	0	55	22	0	36	13	0	15	13	662	
11:00	11:15	0	44	30	0	39	19	0	11	28	693	Peak
11:15	11:30	0	32	25	0	62	6	0	12	38		
11:30	11:45	0	53	25	0	33	14	0	8	29		
11:45	12:00	0	59	32	0	42	13	0	10	29		
12:00	12:15	0	53	31	0	39	16	0	13	41	734	
12:15	12:30	0	58	29	0	38	23	0	13	35	737	
12:30	12:45	0	41	28	0	41	18	0	10	24	723	
12:45	13:00	0	51	23	0	42	18	0	15	34	741	Peak
13:00	13:15	0	48	31	0	46	20	0	18	33	735	
13:15	13:30	0	52	29	0	41	21	0	6	33	539	
13:30	13:45	0	48	28	0	41	22	0	13	28	357	
13:45	14:00	0	43	26	0	63	13	0	7	25	177	

Peak Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
11:00	12:00	0	188	112	0	176	52	0	41	124	693
12:45	13:45	0	199	111	0	170	81	0	52	128	741

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
10:00	10:15	0	37	23	0	36	11	0	8	21
10:15	10:30	0	37	26	0	32	18	0	7	21
10:30	10:45	0	44	38	0	37	18	0	14	36
10:45	11:00	0	54	22	0	36	13	0	15	13
11:00	11:15	0	41	30	0	39	18	0	11	28
11:15	11:30	0	31	25	0	62	6	0	12	38
11:30	11:45	0	53	25	0	33	14	0	8	29
11:45	12:00	0	56	32	0	42	13	0	10	28
12:00	12:15	0	53	31	0	39	16	0	13	40
12:15	12:30	0	55	29	0	38	23	0	13	34
12:30	12:45	0	39	28	0	41	18	0	10	22
12:45	13:00	0	51	23	0	42	18	0	15	33
13:00	13:15	0	45	31	0	45	20	0	18	33
13:15	13:30	0	50	29	0	41	21	0	6	32
13:30	13:45	0	47	28	0	41	22	0	13	26
13:45	14:00	0	42	26	0	62	13	0	7	25

Peak Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
11:00	12:00	0	181	112	0	176	51	0	41	123	684
12:45	13:45	0	193	111	0	169	81	0	52	124	730

Heavy Vehicles

Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave		
Period Start	Period End	U	WB	L	U	R	L	U	R	EB
10:00	10:15	0	1	0	0	0	0	0	0	0
10:15	10:30	0	1	0	0	0	0	0	0	1
10:30	10:45	0	1	0	0	0	0	0	0	0
10:45	11:00	0	1	0	0	0	0	0	0	0
11:00	11:15	0	3	0	0	0	1	0	0	0
11:15	11:30	0	1	0	0	0	0	0	0	0
11:30	11:45	0	0	0	0	0	0	0	0	0
11:45	12:00	0	3	0	0	0	0	0	0	1
12:00	12:15	0	0	0	0	0	0	0	0	1
12:15	12:30	0	3	0	0	0	0	0	0	1
12:30	12:45	0	2	0	0	0	0	0	0	2
12:45	13:00	0	0	0	0	0	0	0	0	1
13:00	13:15	0	3	0	0	1	0	0	0	0
13:15	13:30	0	2	0	0	0	0	0	0	1
13:30	13:45	0	1	0	0	0	0	0	0	2
13:45	14:00	0	1	0	0	1	0	0	0	0

Peak Time		East Approach Russell Ave			Approach Shopping Centre D			West Approach Russell Ave			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
11:00	12:00	0	7	0	0	0	1	0	0	1	9
12:45	13:45	0	6	0	0	1	0	0	0	4	11

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY trafficsurvey.com.au

Intersection of Warringah Rd and Forest Way, Frenchs Fo

GPS -33.751685,151.226416

Date:	Thu 10/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Forest Way
East:	Warringah Rd
South:	N/A
West:	Warringah Rd

Survey Period	AM:	7:00 AM-9:30 AM
	PM:	2:30 PM-6:30 PM
Traffic Peak	AM:	7:30 AM-8:30 AM
	PM:	4:45 PM-5:45 PM

All Vehicles

Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
7:00	7:15	0	268	196	0	184	124	0	141	72	4396	
7:15	7:30	0	270	186	0	173	153	0	157	105	4580	
7:30	7:45	0	234	228	0	211	135	0	195	115	4665	Peak
7:45	8:00	0	275	268	0	220	106	0	222	158	4616	
8:00	8:15	0	227	217	0	245	93	0	225	162	4408	
8:15	8:30	0	240	277	0	186	86	0	198	142	4198	
8:30	8:45	0	219	232	0	201	78	0	195	144	4037	
8:45	9:00	0	151	245	0	211	82	0	211	141	2968	
9:00	9:15	0	172	248	0	164	64	0	153	158	1927	
9:15	9:30	0	167	201	0	221	67	0	164	148	968	
14:30	14:45	0	124	194	0	256	52	0	149	178	4264	
14:45	15:00	0	153	212	0	215	61	0	193	217	4463	
15:00	15:15	0	127	221	0	283	76	0	222	193	4501	
15:15	15:30	0	212	220	0	244	69	0	208	185	4539	
15:30	15:45	0	158	214	0	272	56	0	267	185	4525	
15:45	16:00	0	145	227	0	256	62	0	194	205	4514	
16:00	16:15	0	126	233	0	271	66	0	265	199	4632	
16:15	16:30	0	132	240	0	249	60	0	259	184	4593	
16:30	16:45	0	135	258	0	262	59	0	237	190	4750	
16:45	17:00	0	160	237	0	280	48	0	265	217	4787	Peak
17:00	17:15	0	140	239	0	228	72	0	240	202	4644	
17:15	17:30	0	127	257	0	308	78	0	266	245	4498	
17:30	17:45	0	125	235	0	340	46	0	259	173	4196	
17:45	18:00	0	177	199	0	240	61	0	181	206	3018	
18:00	18:15	0	121	243	0	206	38	0	179	188	1954	
18:15	18:30	0	109	158	0	201	40	0	267	204	979	

Peak Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
7:30	8:30	0	976	990	0	862	420	0	840	577	4665
16:45	17:45	0	552	968	0	1156	244	0	1030	837	4787

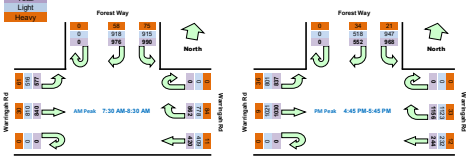
Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

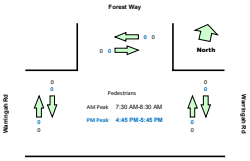
Graphic

Total

Light

Heavy





Light Vehicles

Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
7:00	7:15	0	248	177	0	168	123	0	133	64
7:15	7:30	0	253	174	0	158	151	0	152	95
7:30	7:45	0	217	211	0	191	133	0	189	104
7:45	8:00	0	263	254	0	206	102	0	218	139
8:00	8:15	0	213	196	0	214	91	0	213	149
8:15	8:30	0	225	254	0	167	83	0	190	124
8:30	8:45	0	207	220	0	181	71	0	186	132
8:45	9:00	0	139	224	0	194	81	0	201	125
9:00	9:15	0	161	227	0	143	62	0	145	138
9:15	9:30	0	149	185	0	199	66	0	158	130
14:30	14:45	0	115	177	0	243	51	0	147	159
14:45	15:00	0	143	200	0	202	57	0	192	207
15:00	15:15	0	115	205	0	257	72	0	220	183
15:15	15:30	0	194	207	0	223	66	0	205	170
15:30	15:45	0	149	202	0	258	53	0	262	171
15:45	16:00	0	131	220	0	236	59	0	190	190
16:00	16:15	0	108	221	0	257	55	0	263	183
16:15	16:30	0	122	230	0	238	56	0	259	169
16:30	16:45	0	124	253	0	249	56	0	236	178
16:45	17:00	0	152	230	0	265	47	0	262	208
17:00	17:15	0	132	236	0	221	67	0	239	193
17:15	17:30	0	115	253	0	299	75	0	264	237
17:30	17:45	0	119	228	0	338	43	0	256	163
17:45	18:00	0	167	195	0	236	58	0	180	198
18:00	18:15	0	116	231	0	201	38	0	179	180
18:15	18:30	0	103	157	0	196	39	0	267	193

Peak Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
7:30	8:30	0	918	915	0	778	409	0	810	516	4346
16:45	17:45	0	518	947	0	1123	232	0	1021	801	4642

Heavy Vehicles

Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd		
Period Start	Period End	U	R	L	U	R	WB	U	EB	L
7:00	7:15	0	20	19	0	16	1	0	8	8
7:15	7:30	0	17	12	0	15	2	0	5	10
7:30	7:45	0	17	17	0	20	2	0	6	11
7:45	8:00	0	12	14	0	14	4	0	4	19
8:00	8:15	0	14	21	0	31	2	0	12	13
8:15	8:30	0	15	23	0	19	3	0	8	18
8:30	8:45	0	12	12	0	20	7	0	9	12
8:45	9:00	0	12	21	0	17	1	0	10	16
9:00	9:15	0	11	21	0	21	2	0	8	20
9:15	9:30	0	18	16	0	22	1	0	6	18
14:30	14:45	0	9	17	0	13	1	0	2	19
14:45	15:00	0	10	12	0	13	4	0	1	10
15:00	15:15	0	12	16	0	26	4	0	2	10
15:15	15:30	0	18	13	0	21	3	0	3	15
15:30	15:45	0	9	12	0	14	3	0	5	14
15:45	16:00	0	14	7	0	20	3	0	4	15
16:00	16:15	0	18	12	0	14	11	0	2	16
16:15	16:30	0	10	10	0	11	4	0	0	15
16:30	16:45	0	11	5	0	13	3	0	1	12
16:45	17:00	0	8	7	0	15	1	0	3	9
17:00	17:15	0	8	3	0	7	5	0	1	9
17:15	17:30	0	12	4	0	9	3	0	2	8
17:30	17:45	0	6	7	0	2	3	0	3	10
17:45	18:00	0	10	4	0	4	3	0	1	8
18:00	18:15	0	5	12	0	5	0	0	0	8
18:15	18:30	0	6	1	0	5	1	0	0	11

Peak Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
7:30	8:30	0	58	75	0	84	11	0	30	61	319
16:45	17:45	0	34	21	0	33	12	0	9	36	145

Pedestrians Crossing

Time		North Approach Forest Way		East Approach Warringah Rd		West Approach Warringah Rd		Hourly Total
Period Start	Period End	Eastbound	Westbound	Northbound	Southbound	Northbound	Southbound	
7:00	7:15	0	0	0	0	0	0	1
7:15	7:30	0	1	0	0	0	0	1
7:30	7:45	0	0	0	0	0	0	0
7:45	8:00	0	0	0	0	0	0	1
8:00	8:15	0	0	0	0	0	0	1
8:15	8:30	0	0	0	0	0	0	1
8:30	8:45	0	1	0	0	0	0	1
8:45	9:00	0	0	0	0	0	0	0
9:00	9:15	0	0	0	0	0	0	0
9:15	9:30	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	0	0	7
14:45	15:00	0	0	0	0	0	0	7
15:00	15:15	6	0	0	0	1	0	7
15:15	15:30	0	0	0	0	0	0	0
15:30	15:45	0	0	0	0	0	0	0
15:45	16:00	0	0	0	0	0	0	0
16:00	16:15	0	0	0	0	0	0	0
16:15	16:30	0	0	0	0	0	0	0
16:30	16:45	0	0	0	0	0	0	0
16:45	17:00	0	0	0	0	0	0	0
17:00	17:15	0	0	0	0	0	0	0
17:15	17:30	0	0	0	0	0	0	0
17:30	17:45	0	0	0	0	0	0	0
17:45	18:00	0	0	0	0	0	0	0
18:00	18:15	0	0	0	0	0	0	0
18:15	18:30	0	0	0	0	0	0	0

Peak Time		North Approach Forest Way		East Approach Warringah Rd		West Approach Warringah Rd		Peak total
Period Start	Period End	Eastbound	Westbound	Northbound	Southbound	Northbound	Southbound	
7:30	8:30	0	0	0	0	0	0	0
16:45	17:45	0	0	0	0	0	0	0

Queue

Time		North	East	West
Period Start	Period End			
7:00	7:05	14	12	20
7:05	7:10	16	10	26
7:10	7:15	14	11	24
7:15	7:20	12	16	20
7:20	7:25	17	10	27
7:25	7:30	14	16	21
7:30	7:35	9	12	25
7:35	7:40	15	15	22
7:40	7:45	16	15	27
7:45	7:50	17	14	20
7:50	7:55	19	16	26
7:55	8:00	17	15	22
8:00	8:05	17	13	23
8:05	8:10	16	16	29
8:10	8:15	18	14	20
8:15	8:20	16	14	22
8:20	8:25	11	12	23
8:25	8:30	19	14	22
8:30	8:35	16	12	15
8:35	8:40	15	13	12
8:40	8:45	8	14	15
8:45	8:50	14	15	14
8:50	8:55	18	14	14
8:55	9:00	11	12	16
9:00	9:05	8	14	13
9:05	9:10	13	15	18
9:10	9:15	15	16	19
9:15	9:20	12	15	13
9:20	9:25	12	12	16
9:25	9:30	17	12	13
14:30	14:35	8	8	13
14:35	14:40	14	12	13
14:40	14:45	17	12	11
14:45	14:50	19	9	10
14:50	14:55	17	10	13
14:55	15:00	15	11	11
15:00	15:05	14	11	9
15:05	15:10	11	10	12
15:10	15:15	16	12	14
15:15	15:20	16	15	16
15:20	15:25	19	12	16
15:25	15:30	16	14	18
15:30	15:35	18	14	20
15:35	15:40	22	15	21
15:40	15:45	15	16	11
15:45	15:50	18	15	17
15:50	15:55	17	12	13
15:55	16:00	16	12	10
16:00	16:05	23	11	15
16:05	16:10	19	14	14
16:10	16:15	19	11	14
16:15	16:20	21	15	13
16:20	16:25	22	14	16
16:25	16:30	19	15	17
16:30	16:35	17	13	16
16:35	16:40	22	12	10
16:40	16:45	22	10	11
16:45	16:50	16	15	18
16:50	16:55	22	9	11
16:55	17:00	26	11	18
17:00	17:05	20	11	16
17:05	17:10	18	12	16
17:10	17:15	21	12	11
17:15	17:20	19	14	12
17:20	17:25	18	12	10
17:25	17:30	16	11	14
17:30	17:35	18	14	20
17:35	17:40	20	10	11
17:40	17:45	17	9	19
17:45	17:50	25	14	15
17:50	17:55	15	12	16
17:55	18:00	9	12	10
18:00	18:05	14	13	13
18:05	18:10	9	12	13
18:10	18:15	11	11	17
18:15	18:20	13	12	15
18:20	18:25	15	12	13
18:25	18:30	14	12	7

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY trafficsurvey.com.au

Intersection of Warringah Rd and Forest Way, Frenchs Fo

GPS -33.751685,151.226415

Date:	Sat 12/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Forest Way
East:	Warringah Rd
South:	N/A
West:	Warringah Rd

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-2:00 PM
Traffic Peak	AM:	11:00 AM-12:00 PM
	PM:	12:00 PM-1:00 PM

All Vehicles

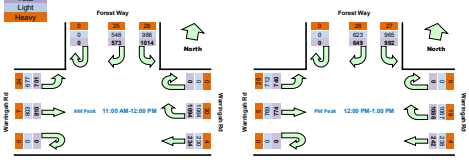
Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd			Hourly Total	
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	Hour	Peak
10:00	10:15	0	142	225	0	272	46	0	159	165	4165	
10:15	10:30	0	158	251	0	243	54	0	156	169	4249	
10:30	10:45	0	129	232	0	259	70	0	176	156	4292	
10:45	11:00	0	125	262	0	289	54	0	205	168	4409	
11:00	11:15	0	150	252	0	263	46	0	198	184	4426	Peak
11:15	11:30	0	147	249	0	255	52	0	209	162		
11:30	11:45	0	140	264	0	288	70	0	209	168		
11:45	12:00	0	136	249	0	288	66	0	194	187		
12:00	12:15	0	171	264	0	253	62	0	194	191	4483	Peak
12:15	12:30	0	166	245	0	296	51	0	200	186	4456	
12:30	12:45	0	150	236	0	262	62	0	186	161	4323	
12:45	13:00	0	162	247	0	275	67	0	194	202	4332	
13:00	13:15	0	145	246	0	279	63	0	198	177	4303	
13:15	13:30	0	145	235	0	244	55	0	167	165	3195	
13:30	13:45	0	145	249	0	258	51	0	201	162	2184	
13:45	14:00	0	145	284	0	244	56	0	191	198	1118	

Peak Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
11:00	12:00	0	573	1014	0	1094	234	0	810	701	4426
12:00	13:00	0	649	992	0	1086	242	0	774	740	4483

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

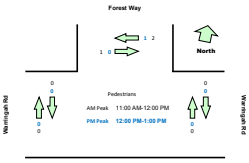
Total
Light
Heavy



Pedestrians Crossing

Time		North Approach Forest Way		East Approach Warringah Rd		West Approach Warringah Rd		Hourly Total
Period Start	Period End	Eastbound	Westbound	Northbound	Southbound	Northbound	Southbound	
10:00	10:15	0	0	0	0	0	0	0
10:15	10:30	0	0	0	0	0	0	0
10:30	10:45	0	0	0	0	0	0	0
10:45	11:00	0	0	0	0	0	0	0
11:00	11:15	0	0	0	0	0	0	3
11:15	11:30	0	0	0	0	0	0	
11:30	11:45	0	0	0	0	0	0	
11:45	12:00	2	1	0	0	0	0	
12:00	12:15	0	0	0	0	0	0	1
12:15	12:30	1	0	0	0	0	0	1
12:30	12:45	0	0	0	0	0	0	0
12:45	13:00	0	0	0	0	0	0	0
13:00	13:15	0	0	0	0	0	0	0
13:15	13:30	0	0	0	0	0	0	0
13:30	13:45	0	0	0	0	0	0	0
13:45	14:00	0	0	0	0	0	0	0

Peak Time		North Approach Forest Way		East Approach Warringah Rd		West Approach Warringah Rd		Peak total
Period Start	Period End	Eastbound	Westbound	Northbound	Southbound	Northbound	Southbound	
11:00	12:00	2	1	0	0	0	0	3
12:00	13:00	1	0	0	0	0	0	1



Queue

Time		North	East	West
Period Start	Period End			
10:00	10:05	13	14	13
10:05	10:10	7	13	11
10:10	10:15	10	6	14
10:15	10:20	12	8	14
10:20	10:25	9	10	16
10:25	10:30	17	14	16
10:30	10:35	8	5	11
10:35	10:40	7	16	13
10:40	10:45	13	9	14
10:45	10:50	13	16	13
10:50	10:55	10	18	12
10:55	11:00	10	13	15
11:00	11:05	14	9	12
11:05	11:10	10	9	10
11:10	11:15	14	13	12
11:15	11:20	15	12	11
11:20	11:25	15	18	11
11:25	11:30	16	17	17
11:30	11:35	8	19	16
11:35	11:40	14	11	9
11:40	11:45	18	16	14
11:45	11:50	11	15	15
11:50	11:55	14	14	10
11:55	12:00	18	16	16
12:00	12:05	12	18	15
12:05	12:10	22	16	17
12:10	12:15	15	16	16
12:15	12:20	25	14	16
12:20	12:25	19	13	14
12:25	12:30	11	15	17
12:30	12:35	10	17	17
12:35	12:40	13	10	17
12:40	12:45	13	15	15
12:45	12:50	11	14	17
12:50	12:55	22	16	14
12:55	13:00	18	16	19
13:00	13:05	14	17	15
13:05	13:10	10	13	12
13:10	13:15	14	17	15
13:15	13:20	13	11	10
13:20	13:25	8	11	20
13:25	13:30	18	9	11
13:30	13:35	10	10	8
13:35	13:40	20	11	13
13:40	13:45	10	12	13
13:45	13:50	17	8	12
13:50	13:55	21	15	11
13:55	14:00	11	10	10

Light Vehicles

Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd			
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
10:00	10:15	0	135	220	0	269	46	0	158	150	
10:15	10:30	0	150	241	0	238	54	0	155	160	
10:30	10:45	0	124	227	0	252	70	0	174	150	
10:45	11:00	0	120	255	0	282	54	0	202	160	
11:00	11:15	0	144	242	0	250	44	0	197	179	
11:15	11:30	0	141	241	0	249	52	0	204	158	
11:30	11:45	0	135	260	0	281	69	0	208	162	
11:45	12:00	0	128	243	0	284	65	0	194	178	
12:00	12:15	0	166	256	0	251	62	0	193	182	
12:15	12:30	0	157	237	0	287	51	0	200	177	
12:30	12:45	0	148	231	0	258	60	0	183	155	
12:45	13:00	0	152	241	0	271	65	0	193	198	
13:00	13:15	0	136	235	0	266	63	0	194	170	
13:15	13:30	0	139	228	0	240	54	0	163	157	
13:30	13:45	0	136	246	0	247	51	0	198	157	
13:45	14:00	0	139	273	0	240	55	0	189	190	

Peak Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
11:00	12:00	0	548	986	0	1064	230	0	803	677	4308
12:00	13:00	0	623	965	0	1067	238	0	769	712	4374

Heavy Vehicles

Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd			
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	
10:00	10:15	0	7	5	0	3	0	0	1	15	
10:15	10:30	0	8	10	0	5	0	0	1	9	
10:30	10:45	0	5	5	0	7	0	0	2	6	
10:45	11:00	0	5	7	0	7	0	0	3	8	
11:00	11:15	0	6	10	0	13	2	0	1	5	
11:15	11:30	0	6	8	0	6	0	0	5	4	
11:30	11:45	0	5	4	0	7	1	0	1	6	
11:45	12:00	0	8	6	0	4	1	0	0	9	
12:00	12:15	0	5	8	0	2	0	0	1	9	
12:15	12:30	0	9	8	0	9	0	0	0	9	
12:30	12:45	0	2	5	0	4	2	0	3	6	
12:45	13:00	0	10	6	0	4	2	0	1	4	
13:00	13:15	0	9	11	0	13	0	0	4	7	
13:15	13:30	0	6	7	0	4	1	0	4	8	
13:30	13:45	0	9	3	0	11	0	0	3	5	
13:45	14:00	0	6	11	0	4	1	0	2	8	

Peak Time		North Approach Forest Way			East Approach Warringah Rd			West Approach Warringah Rd			Peak
Period Start	Period End	U	R	L	U	R	WB	U	EB	L	total
11:00	12:00	0	25	28	0	30	4	0	7	24	118
12:00	13:00	0	26	27	0	19	4	0	5	28	109

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

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Intersection of Forest Way and Naree Rd, Frenchs Forest

GPS -33.749468,151.224066

Date:	Thu 10/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Forest Way
East:	Naree Rd
South:	Forest Way
West:	N/A

Survey Period	AM:	7:00 AM-9:30 AM
	PM:	2:30 PM-6:30 PM
Traffic Peak	AM:	7:45 AM-8:45 AM
	PM:	4:45 PM-5:45 PM

All Vehicles

Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
7:00	7:15	0	399	21	0	42	29	0	15	220	3450	
7:15	7:30	0	426	27	0	51	32	0	21	259	3688	
7:30	7:45	0	484	47	0	35	32	0	22	281	3843	
7:45	8:00	0	458	46	0	53	49	0	25	376	3871	Peak
8:00	8:15	0	412	44	0	64	49	0	43	352	3712	
8:15	8:30	0	459	53	0	71	42	0	32	314	3593	
8:30	8:45	0	419	55	0	62	57	0	41	295	3498	
8:45	9:00	0	372	49	0	53	37	0	34	303	2569	
9:00	9:15	0	402	52	0	49	36	0	31	275	1721	
9:15	9:30	0	370	47	0	51	33	0	47	328	876	
14:30	14:45	0	297	49	0	57	21	0	24	363	3647	
14:45	15:00	0	346	52	0	68	40	0	39	392	3764	
15:00	15:15	0	351	44	0	62	41	0	35	409	3798	
15:15	15:30	0	389	56	0	59	39	0	53	361	3789	
15:30	15:45	0	332	67	0	50	48	0	61	370	3776	
15:45	16:00	0	365	59	0	63	28	0	39	417	3756	
16:00	16:15	0	355	47	0	60	33	0	49	389	3749	
16:15	16:30	0	366	60	0	67	24	0	44	383	3768	
16:30	16:45	0	332	67	0	61	33	0	55	360	3876	
16:45	17:00	0	371	47	0	61	29	0	33	423	3937	Peak
17:00	17:15	0	324	76	0	71	32	0	45	404	3824	
17:15	17:30	0	394	54	0	60	28	0	55	461	3675	
17:30	17:45	0	359	35	0	59	34	0	36	446	3384	
17:45	18:00	0	297	42	0	53	26	0	43	390	2415	
18:00	18:15	0	328	34	0	34	23	0	41	343	1564	
18:15	18:30	0	260	32	0	47	21	0	43	358	761	

Peak Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
7:45	8:45	0	1748	198	0	250	197	0	141	1337	3871
16:45	17:45	0	1448	212	0	251	123	0	169	1734	3937

Pedestrians Crossing

Time		North Approach Forest Way		East Approach Naree Rd		South Approach Forest Way		Hourly Total
Period Start	Period End	Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	
7:00	7:15	0	0	1	0	1	0	5
7:15	7:30	0	0	0	0	0	0	8
7:30	7:45	0	0	0	0	0	1	8
7:45	8:00	0	0	0	0	1	1	7
8:00	8:15	0	0	1	2	1	1	5
8:15	8:30	0	0	0	0	0	0	6
8:30	8:45	0	0	0	0	0	0	7
8:45	9:00	0	0	0	0	0	0	7
9:00	9:15	0	0	0	4	0	2	7
9:15	9:30	0	0	0	0	1	0	1
14:30	14:45	0	0	0	0	0	0	10
14:45	15:00	0	0	0	1	0	1	18
15:00	15:15	0	0	1	1	1	1	25
15:15	15:30	0	0	2	0	2	0	23
15:30	15:45	0	0	2	1	4	1	26
15:45	16:00	0	0	2	0	3	4	19
16:00	16:15	0	0	1	0	0	1	10
16:15	16:30	0	0	3	0	3	1	9
16:30	16:45	0	0	0	0	1	0	5
16:45	17:00	0	0	0	0	0	0	6
17:00	17:15	0	0	1	0	0	0	7
17:15	17:30	0	0	2	0	1	0	7
17:30	17:45	0	0	1	0	1	0	5
17:45	18:00	0	0	0	0	0	1	3
18:00	18:15	0	0	0	0	0	1	2
18:15	18:30	0	0	1	0	0	0	1

Peak Time		North Approach Forest Way		East Approach Naree Rd		South Approach Forest Way		Peak total
Period Start	Period End	Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	
7:45	8:45	0	0	1	2	2	2	7
16:45	17:45	0	0	4	0	2	0	6

Queue

Time		North	East	South
Period Start	Period End			
7:00	7:05	9	5	2
7:05	7:10	11	7	3
7:10	7:15	12	7	4
7:15	7:20	15	8	3
7:20	7:25	17	7	4
7:25	7:30	18	7	7
7:30	7:35	20	9	8
7:35	7:40	17	8	7
7:40	7:45	18	7	13
7:45	7:50	17	6	10
7:50	7:55	15	7	16
7:55	8:00	18	8	13
8:00	8:05	20	9	17
8:05	8:10	16	7	25
8:10	8:15	19	8	26
8:15	8:20	18	8	18
8:20	8:25	21	7	16
8:25	8:30	18	7	14
8:30	8:35	19	6	21
8:35	8:40	17	8	13
8:40	8:45	16	8	9
8:45	8:50	18	9	16
8:50	8:55	15	7	15
8:55	9:00	14	8	18
9:00	9:05	16	8	16
9:05	9:10	17	7	12
9:10	9:15	18	8	16
9:15	9:20	16	7	22
9:20	9:25	18	9	9
9:25	9:30	15	8	13
14:30	14:35	13	7	11
14:35	14:40	15	7	15
14:40	14:45	14	8	13
14:45	14:50	16	8	13
14:50	14:55	17	9	12
14:55	15:00	16	7	16
15:00	15:05	18	8	14
15:05	15:10	18	7	18
15:10	15:15	19	8	12
15:15	15:20	20	8	17
15:20	15:25	17	10	17
15:25	15:30	16	8	18
15:30	15:35	15	7	12
15:35	15:40	18	8	18
15:40	15:45	19	7	20
15:45	15:50	16	9	17
15:50	15:55	17	7	18
15:55	16:00	18	8	16
16:00	16:05	21	8	12
16:05	16:10	15	7	15
16:10	16:15	17	8	16
16:15	16:20	16	8	10
16:20	16:25	15	6	16
16:25	16:30	17	6	14
16:30	16:35	16	7	19
16:35	16:40	15	8	15
16:40	16:45	14	9	14
16:45	16:50	16	7	15
16:50	16:55	13	8	14
16:55	17:00	17	8	14
17:00	17:05	18	7	8
17:05	17:10	14	7	8
17:10	17:15	16	6	19
17:15	17:20	13	8	17
17:20	17:25	15	8	15
17:25	17:30	16	9	16
17:30	17:35	14	7	15
17:35	17:40	12	8	11
17:40	17:45	14	8	15
17:45	17:50	16	7	14
17:50	17:55	14	8	15
17:55	18:00	13	7	10
18:00	18:05	10	8	10
18:05	18:10	14	8	8
18:10	18:15	16	7	6
18:15	18:20	14	6	10
18:20	18:25	13	7	17
18:25	18:30	14	6	12

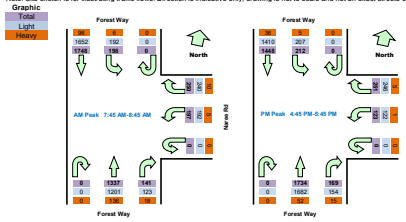
Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

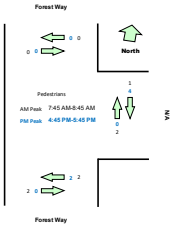
Graphic

Total

Light

Heavy





Light Vehicles

Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
7:00	7:15	0	362	19	0	42	28	0	9	202
7:15	7:30	0	398	26	0	47	32	0	16	239
7:30	7:45	0	449	44	0	34	32	0	18	255
7:45	8:00	0	434	46	0	50	47	0	22	343
8:00	8:15	0	391	42	0	63	47	0	38	314
8:15	8:30	0	431	52	0	69	42	0	29	278
8:30	8:45	0	396	52	0	58	56	0	34	266
8:45	9:00	0	346	49	0	50	36	0	32	272
9:00	9:15	0	367	51	0	44	35	0	25	243
9:15	9:30	0	337	46	0	50	32	0	42	290
14:30	14:45	0	283	48	0	52	20	0	21	331
14:45	15:00	0	329	47	0	66	40	0	34	373
15:00	15:15	0	323	41	0	62	41	0	30	379
15:15	15:30	0	369	53	0	58	38	0	48	331
15:30	15:45	0	317	62	0	49	45	0	54	349
15:45	16:00	0	346	58	0	60	27	0	33	391
16:00	16:15	0	336	46	0	59	33	0	43	368
16:15	16:30	0	351	59	0	64	23	0	40	359
16:30	16:45	0	322	65	0	59	32	0	48	343
16:45	17:00	0	361	46	0	59	28	0	31	401
17:00	17:15	0	319	74	0	70	32	0	40	393
17:15	17:30	0	381	53	0	59	28	0	50	449
17:30	17:45	0	349	34	0	58	34	0	33	439
17:45	18:00	0	288	41	0	51	26	0	39	381
18:00	18:15	0	320	34	0	33	23	0	38	335
18:15	18:30	0	255	29	0	46	21	0	39	344

Peak Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
7:45	8:45	0	1652	192	0	240	192	0	123	1201	3600
16:45	17:45	0	1410	207	0	246	122	0	154	1682	3821

Heavy Vehicles

Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
7:00	7:15	0	37	2	0	0	1	0	6	18
7:15	7:30	0	28	1	0	4	0	0	5	20
7:30	7:45	0	35	3	0	1	0	0	4	26
7:45	8:00	0	24	0	0	3	2	0	3	33
8:00	8:15	0	21	2	0	1	2	0	5	38
8:15	8:30	0	28	1	0	2	0	0	3	36
8:30	8:45	0	23	3	0	4	1	0	7	29
8:45	9:00	0	26	0	0	3	1	0	2	31
9:00	9:15	0	35	1	0	5	1	0	6	32
9:15	9:30	0	33	1	0	1	1	0	5	38
14:30	14:45	0	14	1	0	5	1	0	3	32
14:45	15:00	0	17	5	0	2	0	0	5	19
15:00	15:15	0	28	3	0	0	0	0	5	30
15:15	15:30	0	20	3	0	1	1	0	5	30
15:30	15:45	0	15	5	0	1	3	0	7	21
15:45	16:00	0	19	1	0	3	1	0	6	26
16:00	16:15	0	19	1	0	1	0	0	6	21
16:15	16:30	0	15	1	0	3	1	0	4	24
16:30	16:45	0	10	2	0	2	1	0	7	17
16:45	17:00	0	10	1	0	2	1	0	2	22
17:00	17:15	0	5	2	0	1	0	0	5	11
17:15	17:30	0	13	1	0	1	0	0	5	12
17:30	17:45	0	10	1	0	1	0	0	3	7
17:45	18:00	0	9	1	0	2	0	0	4	9
18:00	18:15	0	8	0	0	1	0	0	3	8
18:15	18:30	0	5	3	0	1	0	0	4	14

Peak Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
7:45	8:45	0	96	6	0	10	5	0	18	136	271
16:45	17:45	0	38	5	0	5	1	0	15	52	116

TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of Forest Way and Naree Rd, Frenchs Forest

GPS -33.749468,151.224066

Date:	Sat 12/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Forest Way
East:	Naree Rd
South:	Forest Way
West:	N/A

Survey Period	AM:	10:00 AM-12:00 PM
	PM:	12:00 PM-2:00 PM
Traffic Peak	AM:	11:00 AM-12:00 PM
	PM:	12:00 PM-1:00 PM

All Vehicles

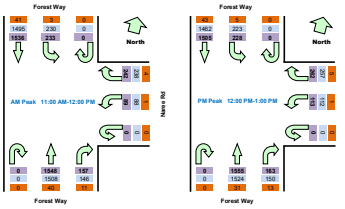
Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
10:00	10:15	0	345	34	0	57	22	0	31	377	3579	
10:15	10:30	0	392	37	0	55	21	0	27	339	3648	
10:30	10:45	0	354	60	0	61	31	0	38	375	3738	
10:45	11:00	0	387	38	0	57	24	0	30	387	3760	
11:00	11:15	0	393	49	0	68	19	0	35	371	3805	Peak
11:15	11:30	0	371	52	0	71	17	0	48	402		
11:30	11:45	0	381	74	0	52	21	0	29	384		
11:45	12:00	0	391	58	0	51	32	0	45	391		
12:00	12:15	0	384	54	0	68	33	0	40	394	3826	Peak
12:15	12:30	0	368	57	0	73	30	0	41	403	3816	
12:30	12:45	0	386	54	0	49	28	0	42	368	3737	
12:45	13:00	0	367	63	0	72	22	0	40	390	3719	
13:00	13:15	0	411	44	0	55	17	0	32	404	3718	
13:15	13:30	0	353	47	0	59	32	0	40	362	2755	
13:30	13:45	0	393	44	0	60	28	0	33	351	1862	
13:45	14:00	0	378	53	0	55	22	0	51	394	953	

Peak Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
11:00	12:00	0	1536	233	0	242	89	0	157	1548	3805
12:00	13:00	0	1505	228	0	262	113	0	163	1555	3826

Note: Site sketch is for illustrating traffic flows. Direction is indicative only, drawing is not to scale and not an exact streets configuration.

Graphic

Total
Light
Heavy



Light Vehicles

Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
10:00	10:15	0	335	34	0	56	22	0	27	365
10:15	10:30	0	379	36	0	53	21	0	23	329
10:30	10:45	0	344	60	0	59	31	0	34	368
10:45	11:00	0	377	36	0	55	24	0	27	374
11:00	11:15	0	378	49	0	67	18	0	32	358
11:15	11:30	0	363	51	0	70	17	0	45	396
11:30	11:45	0	375	74	0	52	21	0	26	376
11:45	12:00	0	379	56	0	49	32	0	43	378
12:00	12:15	0	374	54	0	67	33	0	36	388
12:15	12:30	0	358	55	0	71	29	0	37	392
12:30	12:45	0	377	53	0	49	28	0	38	362
12:45	13:00	0	353	61	0	70	22	0	39	382
13:00	13:15	0	396	43	0	55	17	0	30	389
13:15	13:30	0	345	45	0	56	32	0	35	354
13:30	13:45	0	382	44	0	59	28	0	31	338
13:45	14:00	0	365	51	0	53	22	0	49	382

Peak Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
11:00	12:00	0	1495	230	0	238	88	0	146	1508	3705
12:00	13:00	0	1462	223	0	257	112	0	150	1524	3728

Heavy Vehicles

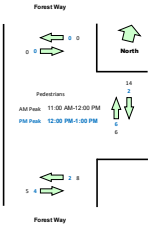
Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way		
Period Start	Period End	U	SB	L	U	R	L	U	R	NB
10:00	10:15	0	10	0	0	1	0	0	4	12
10:15	10:30	0	13	1	0	2	0	0	4	10
10:30	10:45	0	10	0	0	2	0	0	4	7
10:45	11:00	0	10	2	0	2	0	0	3	13
11:00	11:15	0	15	0	0	1	1	0	3	13
11:15	11:30	0	8	1	0	1	0	0	3	6
11:30	11:45	0	6	0	0	0	0	0	3	8
11:45	12:00	0	12	2	0	2	0	0	2	13
12:00	12:15	0	10	0	0	1	0	0	4	6
12:15	12:30	0	10	2	0	2	1	0	4	11
12:30	12:45	0	9	1	0	0	0	0	4	6
12:45	13:00	0	14	2	0	2	0	0	1	8
13:00	13:15	0	15	1	0	0	0	0	2	15
13:15	13:30	0	8	2	0	3	0	0	5	8
13:30	13:45	0	11	0	0	1	0	0	2	13
13:45	14:00	0	13	2	0	2	0	0	2	12

Peak Time		North Approach Forest Way			East Approach Naree Rd			South Approach Forest Way			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
11:00	12:00	0	41	3	0	4	1	0	11	40	100
12:00	13:00	0	43	5	0	5	1	0	13	31	98

Pedestrians Crossing

Time		North Approach Forest Way		East Approach Naree Rd		South Approach Forest Way		Hourly Total
Period Start	Period End	Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	
10:00	10:15	0	0	0	1	0	1	27
10:15	10:30	0	0	1	3	0	0	28
10:30	10:45	0	0	2	3	2	4	44
10:45	11:00	0	0	2	3	3	2	41
11:00	11:15	0	0	1	1	0	1	33
11:15	11:30	0	0	10	3	6	1	
11:30	11:45	0	0	3	0	2	3	
11:45	12:00	0	0	0	2	0	0	
12:00	12:15	0	0	0	2	0	2	14
12:15	12:30	0	0	0	2	2	0	20
12:30	12:45	0	0	2	0	0	0	17
12:45	13:00	0	0	0	2	0	2	22
13:00	13:15	0	0	5	0	5	0	29
13:15	13:30	0	0	0	0	0	1	19
13:30	13:45	0	0	3	0	4	0	18
13:45	14:00	0	0	0	3	2	6	11

Peak Time		North Approach Forest Way		East Approach Naree Rd		South Approach Forest Way		Peak total
Period Start	Period End	Eastbound	Westbound	Northbound	Southbound	Eastbound	Westbound	
11:00	12:00	0	0	14	6	8	5	33
12:00	13:00	0	0	2	6	2	4	14



Queue

Time		North	East	South
Period Start	Period End			
10:00	10:05	12	7	8
10:05	10:10	14	8	13
10:10	10:15	12	9	7
10:15	10:20	14	7	4
10:20	10:25	16	8	9
10:25	10:30	14	8	6
10:30	10:35	13	7	10
10:35	10:40	15	7	9
10:40	10:45	14	6	6
10:45	10:50	16	8	10
10:50	10:55	14	8	3
10:55	11:00	14	9	20
11:00	11:05	16	7	16
11:05	11:10	15	8	20
11:10	11:15	14	9	14
11:15	11:20	16	9	11
11:20	11:25	17	12	14
11:25	11:30	18	7	16
11:30	11:35	20	8	12
11:35	11:40	16	10	14
11:40	11:45	17	12	12
11:45	11:50	18	10	9
11:50	11:55	17	8	7
11:55	12:00	15	12	7
12:00	12:05	17	10	7
12:05	12:10	14	8	14
12:10	12:15	17	8	10
12:15	12:20	14	10	13
12:20	12:25	15	9	11
12:25	12:30	14	8	12
12:30	12:35	14	9	5
12:35	12:40	14	7	12
12:40	12:45	16	8	12
12:45	12:50	14	8	13
12:50	12:55	15	7	18
12:55	13:00	15	8	10
13:00	13:05	14	6	12
13:05	13:10	16	8	8
13:10	13:15	14	8	11
13:15	13:20	14	7	9
13:20	13:25	13	7	10
13:25	13:30	15	6	8
13:30	13:35	15	8	12
13:35	13:40	14	7	17
13:40	13:45	15	9	7
13:45	13:50	16	8	13
13:50	13:55	15	6	9
13:55	14:00	14	7	15

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TURNING MOVEMENT SURVEY

Intersection of N/A and Forest Way, Frenchs Forest

GPS *-33.750311, 151.225550*

Date:	Thu 10/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Forest Way
East:	N/A
South:	Forest Way
West:	N/A

Survey Period	AM:	7:00 AM-9:30 AM
	PM:	2:30 PM-6:30 PM
Traffic Peak	AM:	N/A
	PM:	N/A

Time		an Crossing Of Fo	
Period Start	Period End	Eastboun	Westbound
7:00	7:15	12	9
7:15	7:30	22	10
7:30	7:45	54	24
7:45	8:00	100	24
8:00	8:15	52	31
8:15	8:30	16	11
8:30	8:45	18	7
8:45	9:00	8	12
9:00	9:15	8	7
9:15	9:30	7	5
14:30	14:45	4	14
14:45	15:00	2	4
15:00	15:15	13	11
15:15	15:30	18	63
15:30	15:45	15	17
15:45	16:00	5	52
16:00	16:15	20	86
16:15	16:30	23	29
16:30	16:45	14	7
16:45	17:00	8	9
17:00	17:15	11	8
17:15	17:30	8	13
17:30	17:45	11	10
17:45	18:00	6	2
18:00	18:15	9	8
18:15	18:30	11	3

TRANS TRAFFIC SURVEY

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TURNING MOVEMENT SURVEY

Intersection of N/A and Forest Way, Frenchs Forest

GPS *-33.750311, 151.225550*

Date:	Sat 12/06/21
Weather:	Fine
Suburban:	Frenchs Forest
Customer:	McLaren

North:	Forest Way
East:	N/A
South:	Forest Way
West:	N/A

Survey Period	AM:	10:00 AM-12:30 PM
	PM:	12:30 PM-2:00 PM
Traffic Peak	AM:	N/A
	PM:	N/A

Time		an Crossing Of Fo	
Period Start	Period End	Eastboun	Westbound
10:00	10:15	4	7
10:15	10:30	3	5
10:30	10:45	5	4
10:45	11:00	7	7
11:00	11:15	4	8
11:15	11:30	6	7
11:30	11:45	8	7
11:45	12:00	8	3
12:00	12:15	6	5
12:15	12:30	6	11
12:30	12:45	4	3
12:45	13:00	6	11
13:00	13:15	5	8
13:15	13:30	5	5
13:30	13:45	4	3
13:45	14:00	3	8

ANNEXURE C: SIDRA RESULTS
(52 SHEETS)

2021 BASE RESULTS

MOVEMENT SUMMARY

Site: 103 [EX AM - Naree Rd / Forest Way - 07:45 - 08:45 (Site Folder: Existing AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM EX - 07:45 - 08:45 (Network Folder: Existing)]

Naree Road / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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: Forest Way (S)															
2	T1	All MCs	1407	9.9	1407	9.9	0.377	5.7	LOS A	10.3	78.0	0.28	0.25	0.28	55.0
3	R2	All MCs	148	12.4	148	12.4	* 0.710	57.8	LOS E	10.1	78.5	0.90	0.80	0.91	21.5
Approach			1555	10.2	1555	10.2	0.710	10.6	LOS A	10.3	78.5	0.34	0.31	0.34	45.4
East: Naree Road (E)															
4	L2	All MCs	208	2.5	208	2.5	0.371	37.9	LOS C	10.4	74.0	0.69	0.75	0.69	24.7
6	R2	All MCs	264	3.9	264	3.9	* 0.701	66.6	LOS E	18.9	136.8	0.97	0.83	0.97	24.0
Approach			471	3.3	471	3.3	0.701	53.9	LOS D	18.9	136.8	0.85	0.79	0.85	24.2
North: Forest Way (N)															
7	L2	All MCs	209	2.9	209	2.9	0.709	13.0	LOS A	33.2	241.4	0.69	0.69	0.69	37.7
8	T1	All MCs	1842	5.3	1842	5.3	* 0.709	20.5	LOS B	33.2	241.4	0.66	0.62	0.66	32.1
Approach			2051	5.1	2051	5.1	0.709	19.7	LOS B	33.2	241.4	0.66	0.62	0.66	33.3
All Vehicles			4078	6.8	4078	6.8	0.710	20.2	LOS B	33.2	241.4	0.56	0.52	0.56	34.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX AM - Warringah Road/Forest Way - 07:45 - 08:45 (Site Folder: Existing AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM EX - 07:45 - 08:45 (Network Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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
East: Warringah Road (E)															
5	T1	All MCs	396	4.7	396	4.7	0.436	31.3	LOS C	20.1	146.0	0.71	0.63	0.71	45.1
6	R2	All MCs	934	10.5	934	10.5	* 0.904	90.3	LOS F	27.7	211.0	1.00	0.98	1.21	16.2
Approach			1330	8.8	1330	8.8	0.904	72.7	LOS F	27.7	211.0	0.91	0.87	1.06	22.9
North: Forest Way (N)															
7	L2	All MCs	1087	7.5	1087	7.5	* 0.539	29.8	LOS C	5.7	42.6	0.07	1.02	0.07	48.2
9	R2	All MCs	1045	5.5	1045	5.5	0.455	57.3	LOS E	25.3	179.5	0.77	0.80	0.77	29.5
Approach			2132	6.5	2132	6.5	0.539	43.3	LOS D	25.3	179.5	0.41	0.91	0.41	36.8
West: Warringah Road (S)															
10	L2	All MCs	664	10.9	664	10.9	0.288	20.1	LOS B	9.5	72.5	0.40	0.71	0.40	43.9
11	T1	All MCs	916	4.2	916	4.2	* 0.893	76.3	LOS F	38.2	277.3	1.00	1.01	1.14	29.6
Approach			1581	7.0	1581	7.0	0.893	52.7	LOS D	38.2	277.3	0.75	0.88	0.83	32.5
All Vehicles			5042	7.3	5042	7.3	0.904	54.0	LOS D	38.2	277.3	0.65	0.89	0.71	30.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX AM - Russell Ave / Forest Way - 07:45 - 08:45 (Site Folder: Existing AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM EX - 07:45 - 08:45 (Network Folder: Existing)]

Russell Avenue / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	85	3.7	85	3.7	0.270	5.8	LOS A	0.0	0.0	0.00	0.11	0.00	58.7
2	T1	All MCs	1355	11.7	1355	11.7	0.270	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	66.2
Approach			1440	11.3	1440	11.3	0.270	0.4	NA	0.0	0.0	0.00	0.04	0.00	65.7
North: Forest Way (N)															
8	T1	All MCs	1936	5.3	1936	5.3	0.518	1.8	LOS A	6.5	47.6	0.15	0.12	0.17	51.6
9	R2	All MCs	112	2.8	112	2.8	0.862	65.9	LOS E	3.7	26.2	0.98	1.23	2.09	5.2
Approach			2047	5.2	2047	5.2	0.862	5.3	NA	6.5	47.6	0.19	0.18	0.27	34.1
West: Russell Avenue (W)															
10	L2	All MCs	201	1.6	201	1.6	0.231	5.5	LOS A	0.9	6.7	0.49	0.66	0.49	19.9
12	R2	All MCs	5	20.0	5	20.0	1.000	274.1	LOS F	2.0	16.1	1.00	1.01	1.04	0.7
Approach			206	2.0	206	2.0	1.000	12.4	LOS A	2.0	16.1	0.50	0.67	0.50	11.4
All Vehicles			3694	7.4	3694	7.4	1.000	3.8	NA	6.5	47.6	0.14	0.15	0.18	40.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 102 [EX AM - Pedestrian Crossing (Forest Way) - 07:45 - 08:45 (Site Folder: Existing AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM EX - 07:45 - 08:45 (Network Folder: Existing)]

Pedestrian Crossing (Forest Way)
Existing AM Peak
X.XX AM to XX.XX PM
Site Category: (None)
Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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: Forest Way (S)															
2	T1	All MCs	1440	11.3	1440	11.3	0.344	5.0	LOS A	10.6	81.6	0.31	0.27	0.31	26.7
Approach			1440	11.3	1440	11.3	0.344	5.0	LOS A	10.6	81.6	0.31	0.27	0.31	26.7
North: Forest Way (N)															
8	T1	All MCs	1941	5.4	1941	5.4	* 0.500	3.3	LOS A	19.6	143.6	0.22	0.20	0.22	44.2
Approach			1941	5.4	1941	5.4	0.500	3.3	LOS A	19.6	143.6	0.22	0.20	0.22	44.2
All Vehicles			3381	7.9	3381	7.9	0.500	4.0	LOS A	19.6	143.6	0.26	0.23	0.26	37.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX AM - Forest Way Entry to Centre - 07:45 - 08:45 (Site Folder: Existing AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM EX - 07:45 - 08:45 (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	75	0.0	75	0.0	0.377	9.3	LOS A	0.0	0.0	0.00	0.19	0.00	58.8
2	T1	All MCs	1460	10.5	1460	10.5	0.377	0.0	LOS A	1.7	13.1	0.00	0.05	0.00	65.1
Approach			1535	10.0	1535	10.0	0.377	0.5	NA	1.7	13.1	0.00	0.06	0.00	63.7
North: Forest Way (N)															
8	T1	All MCs	2058	6.3	2058	6.3	0.374	0.0	LOS A	2.8	20.8	0.00	0.00	0.00	69.7
Approach			2058	6.3	2058	6.3	0.374	0.0	NA	2.8	20.8	0.00	0.00	0.00	69.7
All Vehicles			3593	7.9	3593	7.9	0.377	0.2	NA	2.8	20.8	0.00	0.02	0.00	65.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [EX AM - Grace Ave / Russell Ave - 07:45 - 08:45 (Site Folder: Existing AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM EX - 07:45 - 08:45 (Network Folder: Existing)]

Grace Avenue / Russell Avenue
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Roundabout

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: Grace Avenue (S)															
2	T1	All MCs	168	3.8	168	3.8	0.208	2.8	LOS A	1.2	8.7	0.31	0.49	0.31	44.1
3	R2	All MCs	81	0.0	81	0.0	0.208	5.6	LOS A	1.2	8.7	0.31	0.49	0.31	23.5
3u	U	All MCs	1	0.0	1	0.0	0.208	7.0	LOS A	1.2	8.7	0.31	0.49	0.31	23.5
Approach			251	2.5	251	2.5	0.208	3.7	LOS A	1.2	8.7	0.31	0.49	0.31	42.6
East: Russell Avenue (E)															
4	L2	All MCs	80	6.6	80	6.6	0.174	4.9	LOS A	0.9	6.7	0.39	0.58	0.39	25.7
6	R2	All MCs	104	0.0	104	0.0	0.174	7.9	LOS A	0.9	6.7	0.39	0.58	0.39	41.4
6u	U	All MCs	1	0.0	1	0.0	0.174	9.4	LOS A	0.9	6.7	0.39	0.58	0.39	25.7
Approach			185	2.8	185	2.8	0.174	6.6	LOS A	0.9	6.7	0.39	0.58	0.39	38.6
North: Grace Avenue (N)															
7	L2	All MCs	127	0.8	127	0.8	0.245	4.2	LOS A	1.5	10.4	0.27	0.44	0.27	44.2
8	T1	All MCs	185	1.1	185	1.1	0.245	4.1	LOS A	1.5	10.4	0.27	0.44	0.27	44.2
9u	U	All MCs	1	0.0	1	0.0	0.245	8.8	LOS A	1.5	10.4	0.27	0.44	0.27	45.7
Approach			314	1.0	314	1.0	0.245	4.1	LOS A	1.5	10.4	0.27	0.44	0.27	44.2
All Vehicles			749	2.0	749	2.0	0.245	4.6	LOS A	1.5	10.4	0.31	0.49	0.31	42.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [EX AM - Grace Avenue/Site Driveway - 07:45 - 08:45 (Site Folder: Existing AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM EX - 07:45 - 08:45 (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Grace Avenue (S)															
2	T1	All MCs	241	2.6	241	2.6	0.130	0.0	LOS A	0.1	0.4	0.02	0.03	0.02	49.6
3	R2	All MCs	6	0.0	6	0.0	0.130	8.2	LOS A	0.1	0.4	0.02	0.03	0.02	16.8
Approach			247	2.6	247	2.6	0.130	0.2	NA	0.1	0.4	0.02	0.03	0.02	45.3
East: Site Driveway (E)															
4	L2	All MCs	35	0.0	35	0.0	0.038	0.8	LOS A	0.1	1.0	0.35	0.22	0.35	16.2
6	R2	All MCs	8	0.0	8	0.0	0.038	2.2	LOS A	0.1	1.0	0.35	0.22	0.35	9.9
Approach			43	0.0	43	0.0	0.038	1.1	LOS A	0.1	1.0	0.35	0.22	0.35	15.2
North: Grace Avenue (N)															
7	L2	All MCs	3	0.0	3	0.0	0.139	6.1	LOS A	0.0	0.0	0.00	0.02	0.00	46.2
8	T1	All MCs	262	2.8	262	2.8	0.139	0.0	LOS A	0.0	0.0	0.00	0.02	0.00	49.9
Approach			265	2.8	265	2.8	0.139	0.1	NA	0.0	0.0	0.00	0.02	0.00	49.8
All Vehicles			556	2.5	556	2.5	0.139	0.2	NA	0.1	1.0	0.04	0.04	0.04	37.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [EX AM - Russell Avenue/Site Driveway - 07:45 - 08:45 (Site Folder: Existing AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM EX - 07:45 - 08:45 (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Site Driveway (S)															
1	L2	All MCs	60	0.0	60	0.0	0.041	0.4	LOS A	0.2	1.2	0.23	0.11	0.23	10.0
3	R2	All MCs	88	1.2	88	1.2	0.097	1.6	LOS A	0.3	2.3	0.39	0.30	0.39	9.9
Approach			148	0.7	148	0.7	0.097	1.1	LOS A	0.3	2.3	0.32	0.22	0.32	9.9
East: Russell Avenue (E)															
4	L2	All MCs	56	0.0	56	0.0	0.104	6.6	LOS A	0.0	0.0	0.00	0.35	0.00	44.3
5	T1	All MCs	141	4.5	141	4.5	0.104	0.0	LOS A	0.0	0.0	0.00	0.35	0.00	32.3
Approach			197	3.2	197	3.2	0.104	1.9	NA	0.0	0.0	0.00	0.35	0.00	41.5
West: Russell Avenue (W)															
11	T1	All MCs	118	2.7	118	2.7	0.119	0.0	LOS A	0.5	3.6	0.26	0.44	0.26	31.2
12	R2	All MCs	85	0.0	85	0.0	0.119	8.7	LOS A	0.5	3.6	0.26	0.44	0.26	11.2
Approach			203	1.6	203	1.6	0.119	3.7	NA	0.5	3.6	0.26	0.44	0.26	12.6
All Vehicles			548	1.9	548	1.9	0.119	2.3	NA	0.5	3.6	0.18	0.35	0.18	13.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 103 [EX PM - Naree Rd / Forest Way - 16:45 - 17:45 (Site Folder: Existing PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [PM EX - 16:45 - 17:45 (Network Folder: Existing)]

Naree Road / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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: Forest Way (S)															
2	T1	All MCs	1864	3.7	1864	3.7	0.498	11.7	LOS A	19.2	138.7	0.48	0.44	0.48	45.6
3	R2	All MCs	184	10.7	184	10.7	* 0.670	58.7	LOS E	12.3	93.8	0.89	0.80	0.89	21.7
Approach			2048	4.3	2048	4.3	0.670	15.9	LOS B	19.2	138.7	0.51	0.47	0.51	39.9
East: Naree Road (E)															
4	L2	All MCs	132	1.0	132	1.0	0.206	30.0	LOS C	5.3	37.4	0.56	0.69	0.56	27.7
6	R2	All MCs	269	2.4	269	2.4	* 0.668	64.3	LOS E	18.9	135.3	0.96	0.83	0.96	24.5
Approach			401	2.0	401	2.0	0.668	53.0	LOS D	18.9	135.3	0.82	0.78	0.82	25.2
North: Forest Way (N)															
7	L2	All MCs	228	2.9	228	2.9	0.682	15.2	LOS B	29.4	211.3	0.70	0.70	0.70	36.2
8	T1	All MCs	1555	3.2	1555	3.2	* 0.682	22.0	LOS B	29.4	211.3	0.64	0.59	0.64	31.3
Approach			1783	3.2	1783	3.2	0.682	21.1	LOS B	29.4	211.3	0.65	0.61	0.65	32.5
All Vehicles			4232	3.6	4232	3.6	0.682	21.6	LOS B	29.4	211.3	0.60	0.56	0.60	33.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX PM - Warringah Road/Forest Way - 16:45 - 17:45 (Site Folder: Existing PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [PM EX - 16:45 - 17:45 (Network Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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
East: Warringah Road (E)															
5	T1	All MCs	263	5.4	263	5.4	0.187	7.4	LOS A	6.0	44.3	0.33	0.28	0.33	62.2
6	R2	All MCs	1242	3.2	1242	3.2	* 0.670	62.2	LOS E	28.5	204.9	0.95	0.85	0.95	21.3
Approach			1505	3.5	1505	3.5	0.670	52.6	LOS D	28.5	204.9	0.84	0.75	0.84	26.4
North: Forest Way (N)															
7	L2	All MCs	1039	2.4	1029	2.4	0.490	11.8	LOS A	6.6	47.1	0.08	0.59	0.08	47.7
9	R2	All MCs	592	6.3	586	6.4	* 0.766	89.3	LOS F	20.0	142.9	0.95	0.82	0.96	23.2
Approach			1631	3.8	1615	3.8	0.766	40.0	LOS C	20.0	142.9	0.40	0.67	0.40	34.5
West: Warringah Road (S)															
10	L2	All MCs	901	4.7	901	4.7	0.465	29.8	LOS C	19.5	142.2	0.61	0.78	0.61	35.4
11	T1	All MCs	1104	1.0	1104	1.0	* 0.665	44.0	LOS D	34.6	244.4	0.88	0.79	0.88	39.3
Approach			2005	2.7	2005	2.7	0.665	37.6	LOS C	34.6	244.4	0.76	0.78	0.76	38.1
All Vehicles			5141	3.3	5125	3.3	0.766	42.8	LOS D	34.6	244.4	0.67	0.74	0.67	33.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX PM - Russell Ave / Forest Way - 16:45 - 17:45 (Site Folder: Existing PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [PM EX - 16:45 - 17:45 (Network Folder: Existing)]

Russell Avenue / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	162	0.6	162	0.6	0.411	5.8	LOS A	2.5	18.0	0.00	0.13	0.00	57.3
2	T1	All MCs	1755	4.0	1755	4.0	0.411	0.0	LOS A	2.5	18.0	0.00	0.05	0.00	64.8
Approach			1917	3.7	1917	3.7	0.411	0.5	NA	2.5	18.0	0.00	0.05	0.00	64.1
North: Forest Way (N)															
8	T1	All MCs	1464	2.5	1464	2.5	0.361	2.0	LOS A	1.9	13.6	0.07	0.07	0.08	50.0
9	R2	All MCs	189	2.2	189	2.2	1.069	140.6	LOS F	14.0	99.9	1.00	1.93	5.19	2.5
Approach			1654	2.5	1654	2.5	1.069	17.9	NA	14.0	99.9	0.17	0.28	0.67	15.4
West: Russell Avenue (W)															
10	L2	All MCs	248	0.0	248	0.0	0.726	10.5	LOS A	2.5	17.2	0.80	1.07	1.30	12.9
12	R2	All MCs	49	2.1	49	2.1	1.569	687.0	LOS F	12.2	87.0	1.00	1.89	4.43	0.3
Approach			298	0.4	298	0.4	1.569	122.9	LOS F	12.2	87.0	0.83	1.21	1.82	1.4
All Vehicles			3868	2.9	3868	2.9	1.569	17.4	NA	14.0	99.9	0.14	0.24	0.43	16.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 102 [EX PM - Pedestrian Crossing (Forest Way) - 16:45 - 17:45 (Site Folder: Existing PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [PM EX - 16:45 - 17:45 (Network Folder: Existing)]

Pedestrian Crossing (Forest Way)
Existing AM Peak
X.XX AM to XX.XX PM
Site Category: (None)
Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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: Forest Way (S)															
2	T1	All MCs	1917	3.7	1917	3.7	* 0.458	3.4	LOS A	11.3	81.6	0.25	0.23	0.25	33.4
Approach			1917	3.7	1917	3.7	0.458	3.4	LOS A	11.3	81.6	0.25	0.23	0.25	33.4
North: Forest Way (N)															
8	T1	All MCs	1514	2.5	1496	2.5	0.337	0.9	LOS A	3.4	24.6	0.07	0.07	0.07	60.5
Approach			1514	2.5	1496	2.5	0.337	0.9	LOS A	3.4	24.6	0.07	0.07	0.07	60.5
All Vehicles			3431	3.2	3413	3.2	0.458	2.3	LOS A	11.3	81.6	0.17	0.16	0.17	45.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX PM - Forest Way Entry to Centre - 16:45 - 17:45 (Site Folder: Existing PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [PM EX - 16:45 - 17:45 (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	135	0.0	135	0.0	0.650	9.4	LOS A	0.0	0.0	0.00	0.20	0.00	58.2
2	T1	All MCs	1963	3.7	1963	3.7	0.650	0.1	LOS A	0.0	0.0	0.00	0.07	0.00	63.1
Approach			2098	3.5	2098	3.5	0.650	0.7	NA	0.0	0.0	0.00	0.07	0.00	61.7
North: Forest Way (N)															
8	T1	All MCs	1600	3.6	1582	3.6	0.349	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.7
Approach			1600	3.6	1582	3.6	0.349	0.0	NA	0.0	0.0	0.00	0.00	0.00	69.7
All Vehicles			3698	3.5	3680	3.5	0.650	0.4	NA	0.0	0.0	0.00	0.04	0.00	63.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [EX PM - Grace Ave / Russell Ave - 16:45 - 17:45 (Site Folder: Existing PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [PM EX - 16:45 - 17:45 (Network Folder: Existing)]

Grace Avenue / Russell Avenue
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Roundabout

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: Grace Avenue (S)															
2	T1	All MCs	241	0.9	241	0.9	0.301	3.6	LOS A	1.9	13.4	0.49	0.53	0.49	43.7
3	R2	All MCs	76	0.0	76	0.0	0.301	6.4	LOS A	1.9	13.4	0.49	0.53	0.49	21.9
3u	U	All MCs	1	0.0	1	0.0	0.301	7.9	LOS A	1.9	13.4	0.49	0.53	0.49	21.9
Approach			318	0.7	318	0.7	0.301	4.3	LOS A	1.9	13.4	0.49	0.53	0.49	42.6
East: Russell Avenue (E)															
4	L2	All MCs	154	3.4	152	3.4	0.339	5.1	LOS A	2.1	15.2	0.46	0.59	0.46	25.2
6	R2	All MCs	218	0.0	216	0.0	0.339	8.2	LOS A	2.1	15.2	0.46	0.59	0.46	41.2
6u	U	All MCs	3	0.0	3	0.0	0.339	9.7	LOS A	2.1	15.2	0.46	0.59	0.46	25.2
Approach			375	1.4	371	1.4	0.339	6.9	LOS A	2.1	15.2	0.46	0.59	0.46	38.5
North: Grace Avenue (N)															
7	L2	All MCs	60	0.0	60	0.0	0.205	4.1	LOS A	1.2	8.7	0.27	0.43	0.27	44.2
8	T1	All MCs	198	1.1	198	1.1	0.205	4.0	LOS A	1.2	8.7	0.27	0.43	0.27	44.2
9u	U	All MCs	1	0.0	1	0.0	0.205	8.7	LOS A	1.2	8.7	0.27	0.43	0.27	45.7
Approach			259	0.8	259	0.8	0.205	4.1	LOS A	1.2	8.7	0.27	0.43	0.27	44.2
All Vehicles			952	1.0	948	1.0	0.339	5.3	LOS A	2.1	15.2	0.42	0.53	0.42	41.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [EX PM - Grace Avenue/Site Driveway - 16:45 - 17:45 (Site Folder: Existing PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [PM EX - 16:45 - 17:45 (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Grace Avenue (S)															
2	T1	All MCs	304	2.1	304	2.1	0.173	0.0	LOS A	0.2	1.2	0.07	0.10	0.07	49.1
3	R2	All MCs	19	0.0	19	0.0	0.173	10.1	LOS A	0.2	1.2	0.07	0.10	0.07	16.7
Approach			323	2.0	323	2.0	0.173	0.6	NA	0.2	1.2	0.07	0.10	0.07	40.5
East: Site Driveway (E)															
4	L2	All MCs	63	0.0	63	0.0	0.081	1.2	LOS A	0.3	2.1	0.42	0.31	0.42	16.2
6	R2	All MCs	19	0.0	19	0.0	0.081	3.4	LOS A	0.3	2.1	0.42	0.31	0.42	9.9
Approach			82	0.0	82	0.0	0.081	1.7	LOS A	0.3	2.1	0.42	0.31	0.42	14.9
North: Grace Avenue (N)															
7	L2	All MCs	20	0.0	20	0.0	0.183	6.1	LOS A	0.0	0.0	0.00	0.08	0.00	45.8
8	T1	All MCs	334	2.2	332	2.2	0.183	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	49.5
Approach			354	2.1	352	2.1	0.183	0.3	NA	0.0	0.0	0.00	0.08	0.00	49.3
All Vehicles			759	1.8	757	1.8	0.183	0.6	NA	0.3	2.1	0.07	0.11	0.07	33.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [EX PM - Russell Avenue/Site Driveway - 16:45 - 17:45 (Site Folder: Existing PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [PM EX - 16:45 - 17:45 (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Site Driveway (S)															
1	L2	All MCs	81	0.0	81	0.0	0.062	0.8	LOS A	0.2	1.7	0.33	0.20	0.33	10.0
3	R2	All MCs	180	0.6	180	0.6	0.432	3.1	LOS A	1.0	7.2	0.55	0.61	0.67	9.8
Approach			261	0.4	261	0.4	0.432	2.4	LOS A	1.0	7.2	0.48	0.48	0.57	9.9
East: Russell Avenue (E)															
4	L2	All MCs	88	0.0	85	0.0	0.178	6.6	LOS A	0.0	0.0	0.00	0.31	0.00	44.6
5	T1	All MCs	263	2.0	254	2.0	0.178	0.0	LOS A	0.0	0.0	0.00	0.31	0.00	33.8
Approach			352	1.5	339	1.5	0.178	1.7	NA	0.0	0.0	0.00	0.31	0.00	41.8
West: Russell Avenue (W)															
11	T1	All MCs	119	0.9	119	0.9	0.165	0.0	LOS A	0.3	2.4	0.26	0.38	0.26	34.4
12	R2	All MCs	43	0.0	43	0.0	0.165	10.3	LOS A	0.3	2.4	0.26	0.38	0.26	11.3
Approach			162	0.6	162	0.6	0.165	2.7	NA	0.3	2.4	0.26	0.38	0.26	14.1
All Vehicles			775	1.0	762	1.0	0.432	2.1	NA	1.0	7.2	0.22	0.38	0.25	13.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 103 [EX Sat - Naree Rd / Forest Way - 11:30 - 12:30 (Site Folder: Existing WE)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [SAT EX - 11:30 - 12:30 (Network Folder: Existing)]

Naree Road / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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: Forest Way (S)															
2	T1	All MCs	1603	3.0	1603	3.0	0.461	21.3	LOS B	19.3	138.7	0.73	0.46	0.73	35.5
3	R2	All MCs	160	10.2	160	10.2	* 0.427	49.9	LOS D	10.8	82.5	0.93	0.86	0.93	25.8
Approach			1764	3.6	1764	3.6	0.461	23.9	LOS B	19.3	138.7	0.75	0.49	0.75	33.8
East: Naree Road (E)															
4	L2	All MCs	118	1.1	118	1.1	0.196	32.8	LOS C	5.0	35.5	0.59	0.70	0.59	26.6
6	R2	All MCs	249	2.5	249	2.5	* 0.638	64.8	LOS E	17.4	124.6	0.95	0.82	0.95	24.4
Approach			367	2.1	367	2.1	0.638	54.5	LOS D	17.4	124.6	0.83	0.78	0.83	24.8
North: Forest Way (N)															
7	L2	All MCs	247	2.0	247	2.0	0.647	14.7	LOS B	28.4	203.2	0.68	0.70	0.68	36.7
8	T1	All MCs	1555	3.1	1555	3.1	* 0.647	21.0	LOS B	28.4	203.2	0.61	0.57	0.61	32.2
Approach			1802	2.9	1802	2.9	0.647	20.1	LOS B	28.4	203.2	0.62	0.59	0.62	33.4
All Vehicles			3932	3.2	3932	3.2	0.647	25.0	LOS B	28.4	203.2	0.70	0.56	0.70	31.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX Sat - Warringah Road/Forest Way - 11:30 - 12:30 (Site Folder: Existing WE)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [SAT EX - 11:30 - 12:30 (Network Folder: Existing)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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
East: Warringah Road (E)															
5	T1	All MCs	251	1.0	251	1.0	0.270	27.3	LOS B	11.5	81.5	0.64	0.55	0.64	46.6
6	R2	All MCs	1139	2.4	1139	2.4	* 0.911	86.5	LOS F	31.8	227.6	1.00	0.96	1.15	16.8
Approach			1391	2.2	1391	2.2	0.911	75.8	LOS F	31.8	227.6	0.94	0.89	1.06	20.8
North: Forest Way (N)															
7	L2	All MCs	1081	3.0	1069	3.0	* 0.491	16.4	LOS B	5.4	38.9	0.07	1.02	0.07	50.1
9	R2	All MCs	649	4.9	642	4.9	0.286	30.3	LOS C	10.4	74.9	0.46	0.70	0.46	37.4
Approach			1730	3.7	1711	3.7	0.491	21.6	LOS B	10.4	74.9	0.22	0.90	0.22	44.4
West: Warringah Road (S)															
10	L2	All MCs	777	5.3	777	5.3	0.349	18.7	LOS B	12.6	92.0	0.46	0.73	0.46	41.8
11	T1	All MCs	839	0.3	839	0.3	* 0.899	75.0	LOS F	34.7	243.2	1.00	0.99	1.13	29.1
Approach			1616	2.7	1616	2.7	0.899	48.0	LOS D	34.7	243.2	0.74	0.87	0.81	32.2
All Vehicles			4737	2.9	4719	2.9	0.911	46.6	LOS D	34.7	243.2	0.61	0.88	0.67	30.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX Sat Russell Ave / Forest Way - 11:30 - 12:30 (Site Folder: Existing WE)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [SAT EX - 11:30 - 12:30 (Network Folder: Existing)]

Russell Avenue / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	165	1.9	165	1.9	0.314	5.8	LOS A	8.5	61.0	0.00	0.18	0.00	54.4
2	T1	All MCs	1586	3.3	1586	3.3	0.314	0.0	LOS A	14.1	101.7	0.00	0.05	0.00	64.9
Approach			1752	3.2	1752	3.2	0.314	0.6	NA	14.1	101.7	0.00	0.06	0.00	63.8
North: Forest Way (N)															
8	T1	All MCs	1534	2.5	1534	2.5	0.361	0.7	LOS A	1.8	12.9	0.10	0.10	0.10	61.8
9	R2	All MCs	193	1.6	193	1.6	0.571	27.7	LOS B	2.9	20.6	0.93	1.08	1.37	11.1
Approach			1726	2.4	1726	2.4	0.571	3.7	NA	2.9	20.6	0.19	0.21	0.24	40.4
West: Russell Avenue (W)															
10	L2	All MCs	232	0.5	232	0.5	0.529	6.9	LOS A	3.1	22.0	0.63	0.79	0.81	17.3
12	R2	All MCs	69	3.0	69	3.0	1.362	284.0	LOS F	8.7	62.2	1.00	1.59	3.24	0.6
Approach			301	1.0	301	1.0	1.362	70.8	LOS F	8.7	62.2	0.72	0.98	1.37	2.4
All Vehicles			3779	2.6	3779	2.6	1.362	7.6	NA	14.1	101.7	0.14	0.20	0.22	28.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 102 [EX Sat - Pedestrian Crossing (Forest Way) - 11:30 - 12:30 (Site Folder: Existing WE)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [SAT EX - 11:30 - 12:30 (Network Folder: Existing)]

Pedestrian Crossing (Forest Way)
Existing AM Peak
X.XX AM to XX.XX PM
Site Category: (None)
Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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: Forest Way (S)															
2	T1	All MCs	1752	3.2	1752	3.2	* 0.401	4.9	LOS A	11.3	81.6	0.32	0.27	0.32	27.1
Approach			1752	3.2	1752	3.2	0.401	4.9	LOS A	11.3	81.6	0.32	0.27	0.32	27.1
North: Forest Way (N)															
8	T1	All MCs	1603	2.5	1585	2.5	0.351	0.9	LOS A	5.3	38.0	0.08	0.07	0.08	60.0
Approach			1603	2.5	1585	2.5	0.351	0.9	LOS A	5.3	38.0	0.08	0.07	0.08	60.0
All Vehicles			3355	2.9	3336	2.9	0.401	3.0	LOS A	11.3	81.6	0.21	0.18	0.21	41.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX Sat - Forest Way Entry to Centre - 11:30 - 12:30 (Site Folder: Existing WE)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [SAT EX - 11:30 - 12:30 (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	143	0.0	143	0.0	0.626	9.4	LOS A	0.0	0.0	0.00	0.25	0.00	57.6
2	T1	All MCs	1812	3.2	1812	3.2	0.626	0.1	LOS A	0.0	0.0	0.00	0.07	0.00	62.7
Approach			1955	3.0	1955	3.0	0.626	0.8	NA	0.0	0.0	0.00	0.08	0.00	61.2
North: Forest Way (N)															
8	T1	All MCs	1721	3.2	1703	3.2	0.303	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	69.8
Approach			1721	3.2	1703	3.2	0.303	0.0	NA	0.0	0.0	0.00	0.00	0.00	69.8
All Vehicles			3676	3.1	3657	3.1	0.626	0.4	NA	0.0	0.0	0.00	0.05	0.00	63.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [EX Sat - Grace Ave / Russell Ave - 11:30 - 12:30 (Site Folder: Existing WE)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [SAT EX - 11:30 - 12:30 (Network Folder: Existing)]

Grace Avenue / Russell Avenue
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Roundabout

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: Grace Avenue (S)															
2	T1	All MCs	191	0.6	191	0.6	0.262	3.2	LOS A	1.6	11.4	0.41	0.52	0.41	43.8
3	R2	All MCs	102	0.0	102	0.0	0.262	6.0	LOS A	1.6	11.4	0.41	0.52	0.41	22.3
3u	U	All MCs	5	0.0	5	0.0	0.262	7.5	LOS A	1.6	11.4	0.41	0.52	0.41	22.3
Approach			298	0.4	298	0.4	0.262	4.2	LOS A	1.6	11.4	0.41	0.52	0.41	41.8
East: Russell Avenue (E)															
4	L2	All MCs	138	3.8	138	3.8	0.286	5.3	LOS A	1.7	12.2	0.47	0.59	0.47	25.3
6	R2	All MCs	161	0.0	161	0.0	0.286	8.3	LOS A	1.7	12.2	0.47	0.59	0.47	41.3
6u	U	All MCs	1	0.0	1	0.0	0.286	9.8	LOS A	1.7	12.2	0.47	0.59	0.47	25.3
Approach			300	1.8	300	1.8	0.286	6.9	LOS A	1.7	12.2	0.47	0.59	0.47	38.2
North: Grace Avenue (N)															
7	L2	All MCs	79	1.3	79	1.3	0.244	4.3	LOS A	1.5	10.4	0.32	0.45	0.32	44.0
8	T1	All MCs	219	0.0	219	0.0	0.244	4.2	LOS A	1.5	10.4	0.32	0.45	0.32	44.0
9u	U	All MCs	1	0.0	1	0.0	0.244	8.9	LOS A	1.5	10.4	0.32	0.45	0.32	45.5
Approach			299	0.4	299	0.4	0.244	4.3	LOS A	1.5	10.4	0.32	0.45	0.32	44.0
All Vehicles			897	0.8	897	0.8	0.286	5.1	LOS A	1.7	12.2	0.40	0.52	0.40	41.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [EX Sat Grace Avenue/Site Driveway - 11:30 - 12:30 (Site Folder: Existing WE)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [SAT EX - 11:30 - 12:30 (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Grace Avenue (S)															
2	T1	All MCs	274	0.4	274	0.4	0.153	0.0	LOS A	0.1	0.9	0.06	0.08	0.06	49.3
3	R2	All MCs	14	7.7	14	7.7	0.153	10.7	LOS A	0.1	0.9	0.06	0.08	0.06	16.7
Approach			287	0.7	287	0.7	0.153	0.5	NA	0.1	0.9	0.06	0.08	0.06	41.9
East: Site Driveway (E)															
4	L2	All MCs	62	0.0	62	0.0	0.088	1.3	LOS A	0.3	2.3	0.44	0.33	0.44	16.2
6	R2	All MCs	24	0.0	24	0.0	0.088	3.2	LOS A	0.3	2.3	0.44	0.33	0.44	9.9
Approach			86	0.0	86	0.0	0.088	1.8	LOS A	0.3	2.3	0.44	0.33	0.44	14.6
North: Grace Avenue (N)															
7	L2	All MCs	8	0.0	8	0.0	0.186	6.1	LOS A	0.0	0.0	0.00	0.03	0.00	46.1
8	T1	All MCs	352	0.9	352	0.9	0.186	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	49.7
Approach			360	0.9	360	0.9	0.186	0.1	NA	0.0	0.0	0.00	0.03	0.00	49.6
All Vehicles			734	0.7	734	0.7	0.186	0.5	NA	0.3	2.3	0.07	0.09	0.07	33.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [EX Sat - Russell Avenue/Site Driveway - 11:30 - 12:30 (Site Folder: Existing WE)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [SAT EX - 11:30 - 12:30 (Network Folder: Existing)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Site Driveway (S)															
1	L2	All MCs	69	0.0	69	0.0	0.052	0.8	LOS A	0.2	1.4	0.32	0.18	0.32	10.0
3	R2	All MCs	160	0.0	160	0.0	0.265	2.6	LOS A	0.8	5.3	0.49	0.48	0.53	9.9
Approach			229	0.0	229	0.0	0.265	2.1	LOS A	0.8	5.3	0.44	0.39	0.47	9.9
East: Russell Avenue (E)															
4	L2	All MCs	123	0.0	123	0.0	0.189	6.6	LOS A	0.0	0.0	0.00	0.42	0.00	43.9
5	T1	All MCs	235	2.7	235	2.7	0.189	0.0	LOS A	0.0	0.0	0.00	0.42	0.00	30.2
Approach			358	1.8	358	1.8	0.189	2.3	NA	0.0	0.0	0.00	0.42	0.00	41.2
West: Russell Avenue (W)															
11	T1	All MCs	141	2.2	141	2.2	0.139	0.0	LOS A	0.4	2.6	0.25	0.36	0.25	35.0
12	R2	All MCs	46	0.0	46	0.0	0.139	10.5	LOS A	0.4	2.6	0.25	0.36	0.25	11.3
Approach			187	1.7	187	1.7	0.139	2.6	NA	0.4	2.6	0.25	0.36	0.25	14.4
All Vehicles			775	1.2	775	1.2	0.265	2.3	NA	0.8	5.3	0.19	0.40	0.20	14.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

2021 BASE + DEVELOPMENT RESULTS
(LOCAL INTERSECTIONS)

MOVEMENT SUMMARY

Site: 101 [AM EX + DEV - Grace Ave / Russell Ave - 07:45 - 08:45 - Import (Site Folder: AM Existing + Development - Existing Layout)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Grace Avenue / Russell Avenue
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Roundabout

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: Grace Avenue (S)															
2	T1	All MCs	180	3.5	180	3.5	0.237	3.4	LOS A	1.4	10.1	0.39	0.54	0.39	50.0
3	R2	All MCs	87	0.0	87	0.0	0.237	6.1	LOS A	1.4	10.1	0.39	0.54	0.39	30.7
3u	U	All MCs	1	0.0	1	0.0	0.237	7.8	LOS A	1.4	10.1	0.39	0.54	0.39	24.8
Approach			268	2.4	268	2.4	0.237	4.3	LOS A	1.4	10.1	0.39	0.54	0.39	47.0
East: Russell Avenue (E)															
4	L2	All MCs	80	6.6	80	6.6	0.222	5.6	LOS A	1.3	9.1	0.44	0.62	0.44	26.6
6	R2	All MCs	104	0.0	104	0.0	0.222	8.9	LOS A	1.3	9.1	0.44	0.62	0.44	45.9
6u	U	All MCs	49	0.0	49	0.0	0.222	10.5	LOS A	1.3	9.1	0.44	0.62	0.44	30.0
Approach			233	2.3	233	2.3	0.222	8.1	LOS A	1.3	9.1	0.44	0.62	0.44	39.9
North: Grace Avenue (N)															
7	L2	All MCs	127	0.8	127	0.8	0.282	5.5	LOS A	1.7	12.0	0.36	0.51	0.36	48.2
8	T1	All MCs	206	1.0	206	1.0	0.282	5.5	LOS A	1.7	12.0	0.36	0.51	0.36	48.7
9u	U	All MCs	1	0.0	1	0.0	0.282	10.4	LOS A	1.7	12.0	0.36	0.51	0.36	52.1
Approach			334	0.9	334	0.9	0.282	5.5	LOS A	1.7	12.0	0.36	0.51	0.36	48.5
All Vehicles			835	1.8	835	1.8	0.282	5.8	LOS A	1.7	12.0	0.39	0.55	0.39	45.9

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.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [AM EX + DEV - Grace Avenue/Site Driveway - 07:45 - 08:45 - Import (Site Folder: AM Existing + Development - Existing Layout)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Grace Avenue (S)															
2	T1	All MCs	241	2.6	241	2.6	0.146	0.2	LOS A	0.2	1.6	0.10	0.11	0.10	58.2
3	R2	All MCs	27	0.0	27	0.0	0.146	6.5	LOS A	0.2	1.6	0.10	0.11	0.10	56.3
Approach			268	2.4	268	2.4	0.146	0.8	NA	0.2	1.6	0.10	0.11	0.10	57.8
East: Site Driveway (E)															
4	L2	All MCs	53	0.0	53	0.0	0.075	6.4	LOS A	0.3	1.9	0.38	0.62	0.38	51.8
6	R2	All MCs	26	0.0	26	0.0	0.075	7.9	LOS A	0.3	1.9	0.38	0.62	0.38	29.4
Approach			79	0.0	79	0.0	0.075	6.9	LOS A	0.3	1.9	0.38	0.62	0.38	44.6
North: Grace Avenue (N)															
7	L2	All MCs	24	0.0	24	0.0	0.150	2.9	LOS A	0.0	0.0	0.00	0.05	0.00	55.0
8	T1	All MCs	262	2.8	262	2.8	0.150	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	59.5
Approach			286	2.6	286	2.6	0.150	0.3	NA	0.0	0.0	0.00	0.05	0.00	59.1
All Vehicles			634	2.2	634	2.2	0.150	1.3	NA	0.3	1.9	0.09	0.15	0.09	55.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [AM EX + DEV - Russell Avenue/Site Driveway - 07:45 - 08:45 - Import (Site Folder: AM Existing + Development - Existing Layout)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Site Driveway (S)															
1	L2	All MCs	107	0.0	107	0.0	0.074	6.0	LOS A	0.3	2.1	0.24	0.55	0.24	47.8
Approach			107	0.0	107	0.0	0.074	6.0	LOS A	0.3	2.1	0.24	0.55	0.24	47.8
East: Russell Avenue (E)															
4	L2	All MCs	56	0.0	56	0.0	0.104	3.3	LOS A	0.0	0.0	0.00	0.16	0.00	54.0
5	T1	All MCs	141	4.5	141	4.5	0.104	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	53.2
Approach			197	3.2	197	3.2	0.104	0.9	NA	0.0	0.0	0.00	0.16	0.00	53.7
West: Russell Avenue (W)															
11	T1	All MCs	165	1.9	165	1.9	0.086	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach			165	1.9	165	1.9	0.086	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles			469	2.0	469	2.0	0.104	1.8	NA	0.3	2.1	0.06	0.19	0.06	51.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [PM EX + DEV - Grace Ave / Russell Ave - 16:45 - 17:45 - Import (Site Folder: PM Existing + Development - Existing Layout)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Grace Avenue / Russell Avenue
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Roundabout

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: Grace Avenue (S)															
2	T1	All MCs	272	0.8	272	0.8	0.383	4.8	LOS A	2.6	18.2	0.63	0.62	0.63	48.9
3	R2	All MCs	85	0.0	85	0.0	0.383	7.6	LOS A	2.6	18.2	0.63	0.62	0.63	28.7
3u	U	All MCs	1	0.0	1	0.0	0.383	9.2	LOS A	2.6	18.2	0.63	0.62	0.63	22.5
Approach			358	0.6	358	0.6	0.383	5.5	LOS A	2.6	18.2	0.63	0.62	0.63	46.6
East: Russell Avenue (E)															
4	L2	All MCs	154	3.4	154	3.4	0.457	6.1	LOS A	3.3	23.6	0.57	0.64	0.57	25.9
6	R2	All MCs	218	0.0	218	0.0	0.457	9.4	LOS A	3.3	23.6	0.57	0.64	0.57	45.4
6u	U	All MCs	113	0.0	113	0.0	0.457	11.0	LOS A	3.3	23.6	0.57	0.64	0.57	29.3
Approach			484	1.1	484	1.1	0.457	8.7	LOS A	3.3	23.6	0.57	0.64	0.57	39.3
North: Grace Avenue (N)															
7	L2	All MCs	60	0.0	60	0.0	0.273	5.9	LOS A	1.6	11.5	0.44	0.53	0.44	47.8
8	T1	All MCs	234	0.9	234	0.9	0.273	6.0	LOS A	1.6	11.5	0.44	0.53	0.44	48.2
9u	U	All MCs	1	0.0	1	0.0	0.273	10.8	LOS A	1.6	11.5	0.44	0.53	0.44	51.8
Approach			295	0.7	295	0.7	0.273	6.0	LOS A	1.6	11.5	0.44	0.53	0.44	48.1
All Vehicles			1137	0.8	1137	0.8	0.457	7.0	LOS A	3.3	23.6	0.56	0.60	0.56	44.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
Delay Model: SIDRA Standard (Control Delay: Geometric Delay is included).
Queue Model: SIDRA queue estimation methods are used for Back of Queue and Queue at Start of Gap.
Gap-Acceptance Capacity Formula: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.

MOVEMENT SUMMARY

Site: 101 [PM EX + DEV - Grace Avenue/Site Driveway - 16:45 - 17:45 - Import (Site Folder: PM Existing + Development - Existing Layout)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Grace Avenue (S)															
2	T1	All MCs	304	2.1	304	2.1	0.204	0.4	LOS A	0.5	3.5	0.18	0.21	0.18	57.1
3	R2	All MCs	55	0.0	55	0.0	0.204	7.1	LOS A	0.5	3.5	0.18	0.21	0.18	55.8
Approach			359	1.8	359	1.8	0.204	1.4	NA	0.5	3.5	0.18	0.21	0.18	56.8
East: Site Driveway (E)															
4	L2	All MCs	103	0.0	103	0.0	0.180	6.8	LOS A	0.7	4.8	0.48	0.70	0.48	51.2
6	R2	All MCs	59	0.0	59	0.0	0.180	9.6	LOS A	0.7	4.8	0.48	0.70	0.48	29.0
Approach			162	0.0	162	0.0	0.180	7.8	LOS A	0.7	4.8	0.48	0.70	0.48	43.5
North: Grace Avenue (N)															
7	L2	All MCs	56	0.0	56	0.0	0.204	2.9	LOS A	0.0	0.0	0.00	0.08	0.00	54.7
8	T1	All MCs	334	2.2	334	2.2	0.204	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	59.1
Approach			389	1.9	389	1.9	0.204	0.4	NA	0.0	0.0	0.00	0.08	0.00	58.4
All Vehicles			911	1.5	911	1.5	0.204	2.1	NA	0.7	4.8	0.16	0.24	0.16	53.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [PM EX + DEV - Russell Avenue/Site Driveway - 16:45 - 17:45 - Import (Site Folder: PM Existing + Development - Existing Layout)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Site Driveway (S)															
1	L2	All MCs	191	0.0	191	0.0	0.148	6.5	LOS A	0.6	4.4	0.36	0.61	0.36	47.3
Approach			191	0.0	191	0.0	0.148	6.5	LOS A	0.6	4.4	0.36	0.61	0.36	47.3
East: Russell Avenue (E)															
4	L2	All MCs	88	0.0	88	0.0	0.184	3.3	LOS A	0.0	0.0	0.00	0.14	0.00	54.2
5	T1	All MCs	263	2.0	263	2.0	0.184	0.0	LOS A	0.0	0.0	0.00	0.14	0.00	53.9
Approach			352	1.5	352	1.5	0.184	0.8	NA	0.0	0.0	0.00	0.14	0.00	54.1
West: Russell Avenue (W)															
11	T1	All MCs	228	0.5	228	0.5	0.117	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach			228	0.5	228	0.5	0.117	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles			771	0.8	771	0.8	0.184	2.0	NA	0.6	4.4	0.09	0.22	0.09	51.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Parameter Settings dialog (Options tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

2032 BASE RESULTS
(FOREST WAY CORRIDOR)

MOVEMENT SUMMARY

Site: 103 [EX AM - Naree Rd / Forest Way - 07:45 - 08:45 - Copy - Import (Site Folder: EX AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM FU vols - existing geometry - Import (Network Folder: General)]

Naree Road / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
2	T1	All MCs	1466	9.9	1466	9.9	0.389	5.4	LOS A	6.5	49.5	0.28	0.25	0.28	55.5
3	R2	All MCs	148	12.4	148	12.4	* 0.748	65.4	LOS E	6.6	51.3	0.95	0.81	0.98	20.0
Approach			1614	10.1	1614	10.1	0.748	10.9	LOS A	6.6	51.3	0.34	0.30	0.34	45.0
East: Naree Road (E)															
4	L2	All MCs	224	2.3	224	2.3	0.414	40.1	LOS C	7.2	51.2	0.72	0.76	0.72	24.0
6	R2	All MCs	274	3.7	274	3.7	* 0.756	69.2	LOS E	12.4	89.9	0.99	0.85	1.02	23.5
Approach			498	3.1	498	3.1	0.756	56.1	LOS D	12.4	89.9	0.87	0.81	0.88	23.7
North: Forest Way (N)															
7	L2	All MCs	225	2.7	225	2.7	0.752	13.0	LOS A	23.2	168.5	0.73	0.72	0.73	37.6
8	T1	All MCs	1983	5.3	1983	5.3	* 0.752	21.0	LOS B	23.2	168.5	0.70	0.65	0.70	31.7
Approach			2208	5.1	2208	5.1	0.752	20.2	LOS B	23.2	168.5	0.70	0.66	0.70	32.9
All Vehicles			4320	6.7	4320	6.7	0.756	20.9	LOS B	23.2	168.5	0.59	0.54	0.59	33.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX AM - Warringah Road/Forest Way - 07:45 - 08:45 - Copy - Import (Site Folder: EX AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM FU vols - existing geometry - Import (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Warringah Road (E)															
5	T1	All MCs	424	4.4	424	4.4	0.455	30.7	LOS C	13.1	95.0	0.71	0.63	0.71	45.6
6	R2	All MCs	973	10.6	973	10.6	* 0.906	90.0	LOS F	17.7	135.0	1.00	0.98	1.21	16.3
Approach			1397	8.7	1397	8.7	0.906	72.0	LOS F	17.7	135.0	0.91	0.87	1.06	23.1
North: Forest Way (N)															
7	L2	All MCs	1164	7.0	1164	7.0	0.512	13.3	LOS A	7.4	54.7	0.14	0.60	0.14	45.2
9	R2	All MCs	1125	5.5	1125	5.5	* 0.506	63.6	LOS E	15.5	110.0	0.82	0.82	0.82	27.9
Approach			2289	6.3	2289	6.3	0.512	38.0	LOS C	15.5	110.0	0.48	0.71	0.48	34.7
West: Warringah Road (S)															
10	L2	All MCs	693	10.9	693	10.9	0.303	21.7	LOS B	6.3	47.9	0.42	0.71	0.42	43.4
11	T1	All MCs	956	4.3	956	4.3	* 0.909	79.7	LOS F	25.0	181.2	1.00	1.03	1.16	29.1
Approach			1648	7.1	1648	7.1	0.909	55.3	LOS D	25.0	181.2	0.76	0.90	0.85	31.9
All Vehicles			5335	7.2	5335	7.2	0.909	52.3	LOS D	25.0	181.2	0.68	0.81	0.74	30.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX AM - Russell Ave / Forest Way - 07:45 - 08:45 - Copy - Import (Site Folder: EX AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM FU vols - existing geometry - Import (Network Folder: General)]

Russell Avenue / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	88	3.6	88	3.6	0.286	5.8	LOS A	0.0	0.0	0.00	0.11	0.00	34.5
2	T1	All MCs	1412	11.7	1412	11.7	0.286	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	66.2
Approach			1500	11.2	1500	11.2	0.286	0.4	NA	0.0	0.0	0.00	0.04	0.00	61.8
North: Forest Way (N)															
8	T1	All MCs	2105	5.2	2105	5.2	0.500	3.4	LOS A	3.1	22.7	0.10	0.09	0.16	41.6
9	R2	All MCs	119	2.7	119	2.7	1.015	120.5	LOS F	3.0	21.4	1.00	1.53	3.51	3.8
Approach			2224	5.1	2224	5.1	1.015	9.7	NA	3.1	22.7	0.15	0.17	0.34	24.0
West: Russell Avenue (W)															
10	L2	All MCs	209	1.5	209	1.5	0.248	5.7	LOS A	0.4	2.9	0.50	0.68	0.50	19.4
12	R2	All MCs	5	20.0	5	20.0	1.000	249.4	LOS F	0.8	6.4	1.00	1.00	1.02	0.7
Approach			215	2.0	215	2.0	1.000	11.7	LOS A	0.8	6.4	0.52	0.68	0.52	11.9
All Vehicles			3939	7.2	3939	7.2	1.015	6.2	NA	3.1	22.7	0.11	0.15	0.22	31.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 102 [EX AM - Pedestrian Crossing (Forest Way) - 07:45 - 08:45 - Copy - Import (Site Folder: EX AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM FU vols - existing geometry - Import (Network Folder: General)]

Pedestrian Crossing (Forest Way)
Existing AM Peak
X.XX AM to XX.XX PM
Site Category: (None)
Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
2	T1	All MCs	1520	12.4	1520	12.4	0.366	5.3	LOS A	6.5	50.0	0.32	0.28	0.32	25.9
Approach			1520	12.4	1520	12.4	0.366	5.3	LOS A	6.5	50.0	0.32	0.28	0.32	25.9
North: Forest Way (N)															
8	T1	All MCs	2089	5.3	2089	5.3	* 0.538	3.7	LOS A	13.7	100.0	0.25	0.22	0.25	42.4
Approach			2089	5.3	2089	5.3	0.538	3.7	LOS A	13.7	100.0	0.25	0.22	0.25	42.4
All Vehicles			3609	8.3	3609	8.3	0.538	4.3	LOS A	13.7	100.0	0.28	0.24	0.28	35.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX AM - Forest Way Entry to Centre - 07:45 - 08:45 - Copy - Import (Site Folder: EX AM)]

Output produced by SIDRA INTERSECTION Version: 9.1.3.210

Network: N101 [AM FU vols - existing geometry - Import (Network Folder: General)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	87	0.0	87	0.0	0.349	9.3	LOS A	0.0	0.0	0.00	0.27	0.00	57.8
2	T1	All MCs	1531	11.3	1531	11.3	0.349	0.0	LOS A	1.9	14.5	0.00	0.05	0.00	65.1
Approach			1618	10.7	1618	10.7	0.349	0.5	NA	1.9	14.5	0.00	0.06	0.00	63.3
North: Forest Way (N)															
8	T1	All MCs	2216	6.3	2216	6.3	0.402	0.0	LOS A	4.6	34.0	0.00	0.00	0.00	69.7
Approach			2216	6.3	2216	6.3	0.402	0.0	NA	4.6	34.0	0.00	0.00	0.00	69.7
All Vehicles			3834	8.1	3834	8.1	0.402	0.2	NA	4.6	34.0	0.00	0.03	0.00	65.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 103 [EX PM - Naree Rd / Forest Way - 16:45 - 17:45 - Copy - Import (Site Folder: EX PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [PM FU vols - existing geometry - Import (Network Folder: General)]

Naree Road / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
2	T1	All MCs	2094	3.6	2094	3.6	0.539	9.1	LOS A	11.8	85.0	0.43	0.40	0.43	49.4
3	R2	All MCs	206	10.2	206	10.2	* 0.844	63.4	LOS E	9.4	71.8	0.98	0.85	1.03	20.6
Approach			2300	4.2	2300	4.2	0.844	13.9	LOS A	11.8	85.0	0.48	0.44	0.48	41.3
East: Naree Road (E)															
4	L2	All MCs	157	0.8	157	0.8	0.276	36.0	LOS C	4.5	31.6	0.64	0.72	0.64	25.4
6	R2	All MCs	302	2.2	302	2.2	0.865	76.1	LOS F	14.8	105.7	1.00	0.93	1.12	22.3
Approach			460	1.7	460	1.7	0.865	62.4	LOS E	14.8	105.7	0.88	0.86	0.96	23.0
North: Forest Way (N)															
7	L2	All MCs	273	2.9	273	2.9	* 0.889	19.7	LOS B	34.0	244.7	0.88	0.86	0.92	33.9
8	T1	All MCs	1867	3.2	1867	3.2	0.889	32.0	LOS C	34.0	244.7	0.87	0.85	0.92	24.7
Approach			2140	3.2	2140	3.2	0.889	30.4	LOS C	34.0	244.7	0.87	0.85	0.92	26.6
All Vehicles			4899	3.5	4899	3.5	0.889	25.7	LOS B	34.0	244.7	0.69	0.66	0.72	30.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX PM - Warringah Road/Forest Way - 16:45 - 17:45 - Copy - Import (Site Folder: EX PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [PM FU vols - existing geometry - Import (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
East: Warringah Road (E)															
5	T1	All MCs	293	4.9	293	4.9	0.208	7.7	LOS A	4.2	30.6	0.33	0.29	0.33	62.1
6	R2	All MCs	1396	3.1	1396	3.1	* 0.771	64.8	LOS E	20.4	146.5	0.99	0.87	0.99	20.7
Approach			1688	3.4	1688	3.4	0.771	54.9	LOS D	20.4	146.5	0.88	0.77	0.88	25.7
North: Forest Way (N)															
7	L2	All MCs	1246	2.4	1227	2.4	0.614	20.9	LOS B	3.0	21.6	0.05	0.70	0.05	49.4
9	R2	All MCs	708	5.9	698	6.0	* 0.913	105.7	LOS F	15.4	110.0	1.00	0.91	1.12	20.6
Approach			1954	3.7	1925	3.7	0.913	51.6	LOS D	15.4	110.0	0.40	0.77	0.44	26.2
West: Warringah Road (S)															
10	L2	All MCs	1008	4.4	1008	4.4	0.514	36.3	LOS C	13.8	100.2	0.63	0.79	0.63	35.2
11	T1	All MCs	1323	0.8	1323	0.8	* 0.785	51.1	LOS D	27.1	191.1	0.94	0.85	0.94	38.3
Approach			2331	2.3	2331	2.3	0.785	44.7	LOS D	27.1	191.1	0.81	0.82	0.81	33.8
All Vehicles			5974	3.1	5944	3.1	0.913	49.8	LOS D	27.1	191.1	0.69	0.79	0.71	29.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX PM - Russell Ave / Forest Way - 16:45 - 17:45 - Copy - Import (Site Folder: EX PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [PM FU vols - existing geometry - Import (Network Folder: General)]

Russell Avenue / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	182	0.6	182	0.6	0.461	5.8	LOS A	1.3	9.2	0.00	0.13	0.00	34.1
2	T1	All MCs	1972	4.0	1972	4.0	0.461	0.0	LOS A	1.6	11.5	0.00	0.05	0.00	64.7
Approach			2154	3.7	2154	3.7	0.461	0.5	NA	1.6	11.5	0.00	0.05	0.00	59.0
North: Forest Way (N)															
8	T1	All MCs	1746	1.9	1746	1.9	0.441	2.1	LOS A	0.8	5.9	0.05	0.05	0.06	49.4
9	R2	All MCs	226	1.9	226	1.9	1.862	823.9	LOS F	12.0	85.0	1.00	3.85	14.40	0.6
Approach			1973	1.9	1973	1.9	1.862	96.4	NA	12.0	85.0	0.16	0.48	1.70	3.6
West: Russell Avenue (W)															
10	L2	All MCs	279	0.0	279	0.0	0.902	16.7	LOS B	1.7	12.1	0.92	1.49	2.37	9.0
12	R2	All MCs	47	2.2	47	2.2	2.729	1799.8	LOS F	8.6	61.4	1.00	1.79	4.10	0.1
Approach			326	0.3	326	0.3	2.729	275.5	LOS F	8.6	61.4	0.93	1.53	2.62	0.7
All Vehicles			4453	2.7	4453	2.7	2.729	63.1	NA	12.0	85.0	0.14	0.35	0.95	5.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 102 [EX PM - Pedestrian Crossing (Forest Way) - 16:45 - 17:45 - Copy - Import (Site Folder: EX PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [PM FU vols - existing geometry - Import (Network Folder: General)]

Pedestrian Crossing (Forest Way)
Existing AM Peak
X.XX AM to XX.XX PM
Site Category: (None)
Pedestrian Crossing (Signalised) - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
2	T1	All MCs	2154	3.7	2154	3.7	* 0.492	3.8	LOS A	6.9	50.0	0.27	0.25	0.27	31.4
Approach			2154	3.7	2154	3.7	0.492	3.8	LOS A	6.9	50.0	0.27	0.25	0.27	31.4
North: Forest Way (N)															
8	T1	All MCs	1815	2.4	1785	2.4	0.449	2.0	LOS A	7.6	54.4	0.16	0.14	0.16	51.4
Approach			1815	2.4	1785	2.4	0.449	2.0	LOS A	7.6	54.4	0.16	0.14	0.16	51.4
All Vehicles			3968	3.1	3938	3.2	0.492	3.0	LOS A	7.6	54.4	0.22	0.20	0.22	41.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX PM - Forest Way Entry to Centre - 16:45 - 17:45 - Copy - Import (Site Folder: EX PM)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [PM FU vols - existing geometry - Import (Network Folder: General)]

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

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	Aver. Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	135	0.0	135	0.0	0.804	9.6	LOS A	0.0	0.0	0.00	0.19	0.00	57.1
2	T1	All MCs	2197	3.3	2197	3.3	0.804	0.3	LOS A	0.0	0.0	0.00	0.06	0.00	61.8
Approach			2332	3.1	2332	3.1	0.804	0.9	NA	0.0	0.0	0.00	0.07	0.00	60.6
North: Forest Way (N)															
8	T1	All MCs	1920	3.6	1890	3.6	0.338	0.0	LOS A	1.1	7.9	0.00	0.00	0.00	69.8
Approach			1920	3.6	1890	3.6	0.338	0.0	NA	1.1	7.9	0.00	0.00	0.00	69.8
All Vehicles			4252	3.3	4222	3.4	0.804	0.5	NA	1.1	7.9	0.00	0.04	0.00	62.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

2032 BASE + DEVELOPMENT RESULTS
(FOREST WAY CORRIDOR)

MOVEMENT SUMMARY

Site: 101v [FU-noxing-+170EX AM - Forest Way Entry to Centre - 07:45 - 08:45 - Copy - Copy (2) - Conversion - Co (Site Folder: AM Overpass with RT Out)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [AM FU vols - TFNSW layout + 2 phase (overpass) - Import - RT Out 3 Phase (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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: Forest Way (S)															
1	L2	All MCs	62	0.0	62	0.0	0.392	8.0	LOS A	11.6	88.9	0.31	0.33	0.31	50.4
2	T1	All MCs	1520	12.4	1520	12.4	0.392	6.4	LOS A	15.0	116.5	0.34	0.32	0.34	39.8
Approach			1582	11.9	1582	11.9	0.392	6.4	LOS A	15.0	116.5	0.34	0.32	0.34	41.0
North: Forest Way (N)															
8	T1	All MCs	2089	5.3	2089	5.3	* 0.637	0.8	LOS A	11.5	83.9	0.14	0.13	0.14	61.9
9	R2	All MCs	62	0.0	62	0.0	0.420	88.5	LOS F	4.9	34.6	1.00	0.79	1.00	17.7
Approach			2152	5.2	2152	5.2	0.637	3.4	LOS A	11.5	83.9	0.16	0.15	0.16	46.8
West: Centre Entry (W)															
10	L2	All MCs	11	0.0	11	0.0	0.575	77.2	LOS F	2.9	20.3	1.00	0.78	1.07	15.1
12	R2	All MCs	53	0.0	53	0.0	* 0.575	96.6	LOS F	2.9	20.3	1.00	0.78	1.08	15.0
Approach			63	0.0	63	0.0	0.575	93.4	LOS F	2.9	20.3	1.00	0.78	1.07	15.0
All Vehicles			3797	7.9	3797	7.9	0.637	6.1	LOS A	15.0	116.5	0.25	0.23	0.25	39.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX AM - Russell Ave / Forest Way - 07:45 - 08:45 - Copy - Copy - Import - Copy (Site Folder: AM Overpass with RT Out)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [AM FU vols - TFNSW layout + 2 phase (overpass) - Import - RT Out 3 Phase (Network Folder: General)]

Russell Avenue / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	88	3.6	88	3.6	0.292	6.1	LOS A	0.0	0.0	0.00	0.11	0.00	35.6
2	T1	All MCs	1421	11.6	1421	11.6	0.292	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	66.2
Approach			1510	11.2	1510	11.2	0.292	0.4	NA	0.0	0.0	0.00	0.04	0.00	62.2
North: Forest Way (N)															
8	T1	All MCs	2167	5.1	2167	5.1	0.514	4.5	LOS A	9.1	66.4	0.11	0.09	0.18	37.0
9	R2	All MCs	119	2.7	119	2.7	1.027	127.4	LOS F	7.9	56.6	1.00	1.56	3.66	3.6
Approach			2286	4.9	2286	4.9	1.027	10.9	NA	9.1	66.4	0.15	0.17	0.36	22.2
West: Russell Avenue (W)															
10	L2	All MCs	257	1.2	257	1.2	0.307	6.2	LOS A	1.4	10.0	0.53	0.71	0.57	18.6
12	R2	All MCs	5	20.0	5	20.0	1.000	250.6	LOS F	1.9	15.8	1.00	1.00	1.02	0.7
Approach			262	1.6	262	1.6	1.000	11.1	LOS A	1.9	15.8	0.54	0.72	0.58	12.4
All Vehicles			4058	7.0	4058	7.0	1.027	7.0	NA	9.1	66.4	0.12	0.15	0.24	29.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [EX AM - Warringah Road/Forest Way - 07:45 - 08:45 - Copy - Copy - Import - Copy (Site Folder: AM Overpass with RT Out)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [AM FU vols - TFNSW layout + 2 phase (overpass) - Import - RT Out 3 Phase (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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
East: Warringah Road (E)															
5	T1	All MCs	424	4.4	424	4.4	0.449	30.1	LOS C	21.1	153.2	0.70	0.62	0.70	46.0
6	R2	All MCs	1010	10.2	1010	10.2	* 0.905	89.2	LOS F	29.8	227.1	1.00	0.98	1.20	16.4
Approach			1434	8.5	1434	8.5	0.905	71.7	LOS F	29.8	227.1	0.91	0.87	1.05	23.1
North: Forest Way (N)															
7	L2	All MCs	1190	6.9	1190	6.9	* 0.594	14.6	LOS B	8.1	60.2	0.09	1.02	0.09	47.7
9	R2	All MCs	1151	5.4	1151	5.4	0.527	69.2	LOS E	34.5	244.8	0.87	0.83	0.87	27.4
Approach			2341	6.1	2341	6.1	0.594	41.5	LOS C	34.5	244.8	0.48	0.92	0.48	30.5
West: Warringah Road (S)															
10	L2	All MCs	719	10.5	719	10.5	0.317	22.3	LOS B	10.9	83.4	0.43	0.71	0.43	42.9
11	T1	All MCs	956	4.3	956	4.3	* 0.909	79.7	LOS F	40.8	295.8	1.00	1.03	1.16	29.1
Approach			1675	7.0	1675	7.0	0.909	55.0	LOS D	40.8	295.8	0.76	0.90	0.85	30.2
All Vehicles			5450	7.0	5450	7.0	0.909	53.6	LOS D	40.8	295.8	0.68	0.90	0.74	28.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 103 [EX AM - Naree Rd / Forest Way - 07:45 - 08:45 - Copy - Copy - Import - Copy (Site Folder: AM Overpass with RT Out)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [AM FU vols - TFNSW layout + 2 phase (overpass) - Import - RT Out 3 Phase (Network Folder: General)]

Naree Road / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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: Forest Way (S)															
2	T1	All MCs	1518	9.5	1518	9.5	0.402	5.0	LOS A	10.6	80.2	0.26	0.24	0.26	56.5
3	R2	All MCs	154	12.0	154	12.0	* 0.772	69.3	LOS E	11.5	88.8	0.98	0.82	1.01	19.3
Approach			1672	9.8	1672	9.8	0.772	10.9	LOS A	11.5	88.8	0.33	0.29	0.33	45.1
East: Naree Road (E)															
4	L2	All MCs	230	2.2	230	2.2	0.426	40.3	LOS C	12.1	86.4	0.72	0.76	0.72	24.0
6	R2	All MCs	274	3.7	274	3.7	* 0.756	69.2	LOS E	20.3	146.7	0.99	0.85	1.02	23.5
Approach			504	3.1	504	3.1	0.756	56.0	LOS D	20.3	146.7	0.87	0.81	0.88	23.7
North: Forest Way (N)															
7	L2	All MCs	225	2.7	225	2.7	0.763	13.0	LOS A	38.9	282.6	0.74	0.73	0.74	37.5
8	T1	All MCs	2039	5.2	2039	5.2	* 0.763	21.2	LOS B	38.9	282.6	0.71	0.66	0.71	31.5
Approach			2264	4.9	2264	4.9	0.763	20.4	LOS B	38.9	282.6	0.71	0.67	0.71	32.7
All Vehicles			4440	6.5	4440	6.5	0.772	20.8	LOS B	38.9	282.6	0.58	0.54	0.59	33.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101v [FU-noxing+170EX PM - Forest Way Entry to Centre - 16:45 - 17:45 - Copy - Copy (2) - Conversion - Cop (Site Folder: PM Overpass with RT Out)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [PM FU vols - TFNSW layout + 2 phase (overpass) - Import - RT OUT - 3 Phase (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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: Forest Way (S)															
1	L2	All MCs	108	0.0	108	0.0	0.532	8.5	LOS A	23.6	169.8	0.45	0.46	0.45	47.3
2	T1	All MCs	2154	3.7	2154	3.7	* 0.532	8.6	LOS A	24.2	175.1	0.45	0.42	0.45	34.9
Approach			2261	3.5	2261	3.5	0.532	8.6	LOS A	24.2	175.1	0.45	0.42	0.45	36.5
North: Forest Way (N)															
8	T1	All MCs	1816	2.4	1789	2.4	0.514	0.5	LOS A	4.6	32.7	0.08	0.07	0.08	64.8
9	R2	All MCs	108	0.0	107	0.0	0.938	103.2	LOS F	9.3	65.4	1.00	0.95	1.29	15.9
Approach			1924	2.3	1896	2.3	0.938	6.3	LOS A	9.3	65.4	0.13	0.12	0.14	38.0
West: Centre Entry (W)															
10	L2	All MCs	21	0.0	21	0.0	* 0.867	86.0	LOS F	6.9	48.0	1.00	0.96	1.35	14.3
12	R2	All MCs	121	0.0	121	0.0	0.867	102.6	LOS F	6.9	48.0	1.00	0.95	1.37	14.2
Approach			142	0.0	142	0.0	0.867	100.1	LOS F	6.9	48.0	1.00	0.95	1.37	14.3
All Vehicles			4327	2.9	4299	2.9	0.938	10.6	LOS A	24.2	175.1	0.32	0.30	0.34	32.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 101 [EX PM - Russell Ave / Forest Way - 16:45 - 17:45 - Copy - Copy - Import - Copy (Site Folder: PM Overpass with RT Out)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [PM FU vols - TFNSW layout + 2 phase (overpass) - Import - RT OUT - 3 Phase (Network Folder: General)]

Russell Avenue / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Forest Way (S)															
1	L2	All MCs	182	0.6	182	0.6	0.626	6.3	LOS A	0.0	0.0	0.00	0.16	0.00	34.3
2	T1	All MCs	1995	4.0	1995	4.0	0.626	0.1	LOS A	0.0	0.0	0.00	0.04	0.00	64.4
Approach			2177	3.7	2177	3.7	0.626	0.6	NA	0.0	0.0	0.00	0.05	0.00	58.9
North: Forest Way (N)															
8	T1	All MCs	1854	1.8	1854	1.8	0.455	2.5	LOS A	2.9	20.8	0.07	0.07	0.09	46.5
9	R2	All MCs	226	1.9	226	1.9	1.424	427.7	LOS F	29.7	211.3	1.00	3.34	11.68	1.1
Approach			2080	1.8	2080	1.8	1.424	48.8	NA	29.7	211.3	0.17	0.42	1.35	6.7
West: Russell Avenue (W)															
10	L2	All MCs	385	0.0	385	0.0	0.918	16.6	LOS B	7.2	50.6	0.98	1.58	2.60	9.0
12	R2	All MCs	49	2.2	49	2.2	2.322	1413.9	LOS F	20.2	143.7	1.00	1.85	4.30	0.1
Approach			434	0.2	434	0.2	2.322	174.1	LOS F	20.2	143.7	0.98	1.61	2.79	1.0
All Vehicles			4691	2.5	4691	2.5	2.322	38.0	NA	29.7	211.3	0.17	0.36	0.86	8.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data tab).

Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA (TWSC): Level of Service is not defined for major road approaches or the intersection as a whole for Two-Way Sign Control (HCM LOS rule).

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

Site: 101 [EX PM - Warringah Road/Forest Way - 16:45 - 17:45 - Copy - Copy - Import - Copy (Site Folder: PM Overpass with RT Out)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [PM FU vols - TFNSW layout + 2 phase (overpass) - Import - RT OUT - 3 Phase (Network Folder: General)]

New Site
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

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
East: Warringah Road (E)															
5	T1	All MCs	293	4.9	293	4.9	0.208	7.7	LOS A	6.9	50.0	0.33	0.29	0.33	62.1
6	R2	All MCs	1458	3.0	1458	3.0	* 0.837	68.1	LOS E	40.6	291.4	1.00	0.91	1.05	20.0
Approach			1751	3.3	1751	3.3	0.837	58.0	LOS E	40.6	291.4	0.89	0.81	0.93	24.7
North: Forest Way (N)															
7	L2	All MCs	1324	2.2	1306	2.2	0.653	26.9	LOS B	5.5	39.3	0.06	0.69	0.06	49.8
9	R2	All MCs	753	5.5	743	5.6	* 0.975	120.5	LOS F	31.5	224.6	1.00	0.98	1.23	19.1
Approach			2077	3.4	2049	3.5	0.975	60.8	LOS E	31.5	224.6	0.40	0.80	0.48	24.7
West: Warringah Road (S)															
10	L2	All MCs	1053	4.2	1053	4.2	0.610	41.9	LOS C	27.2	197.0	0.71	0.82	0.71	33.0
11	T1	All MCs	1323	0.8	1323	0.8	* 0.823	55.0	LOS D	45.9	323.3	0.97	0.88	0.97	37.1
Approach			2375	2.3	2375	2.3	0.823	49.2	LOS D	45.9	323.3	0.85	0.85	0.86	32.0
All Vehicles			6203	3.0	6176	3.0	0.975	55.6	LOS D	45.9	323.3	0.71	0.82	0.75	27.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

MOVEMENT SUMMARY

Site: 103 [EX PM - Naree Rd / Forest Way - 16:45 - 17:45 - Copy - Copy - Import - Copy (Site Folder: PM Overpass with RT Out)]

Output produced by SIDRA INTERSECTION Version: 9.1.4.221

Network: N101 [PM FU vols - TFNSW layout + 2 phase (overpass) - Import - RT OUT - 3 Phase (Network Folder: General)]

Naree Road / Forest Way
Existing AM Peak
X.XX AM to XX.XX AM
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 160 seconds (Network User-Given Cycle Time)

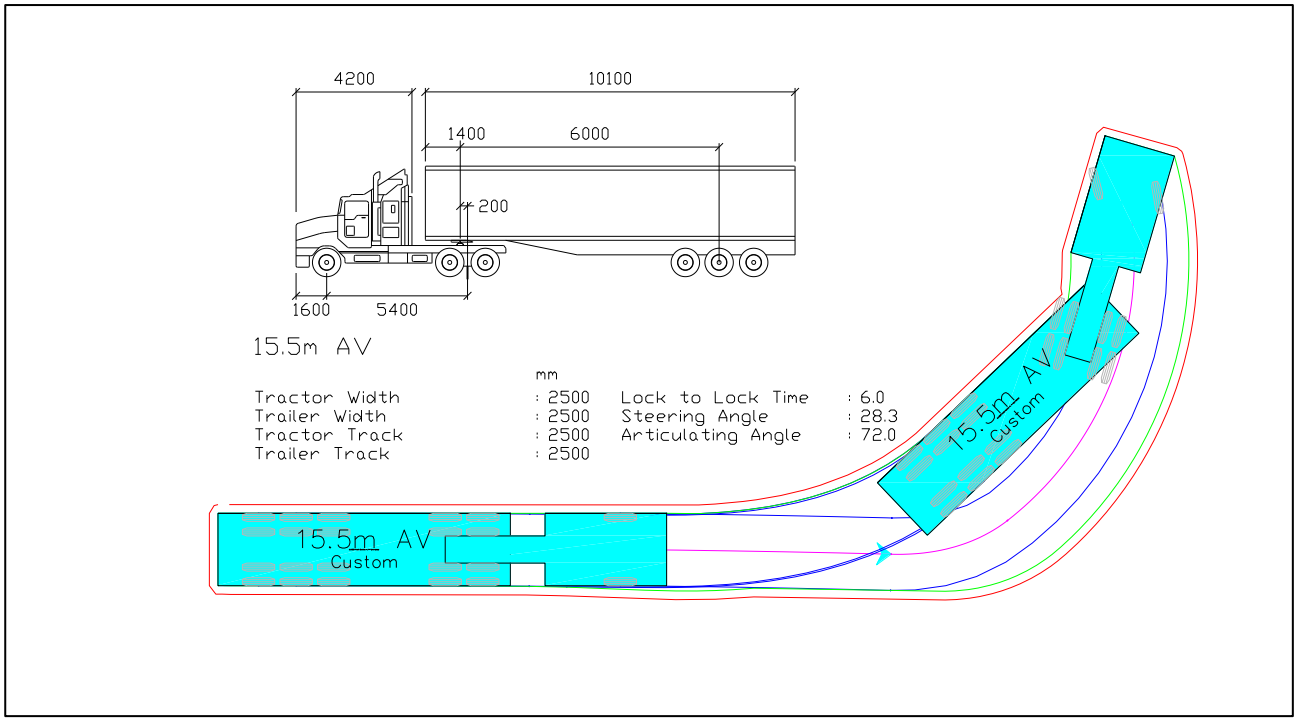
Vehicle Movement Performance

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: Forest Way (S)															
2	T1	All MCs	2212	3.4	2212	3.4	0.549	5.4	LOS A	18.3	131.9	0.32	0.30	0.32	55.6
3	R2	All MCs	216	9.7	216	9.7	* 0.754	60.4	LOS E	15.3	116.1	0.94	0.83	0.96	21.0
Approach			2429	4.0	2429	4.0	0.754	10.3	LOS A	18.3	131.9	0.38	0.35	0.38	45.9
East: Naree Road (E)															
4	L2	All MCs	166	0.8	166	0.8	0.281	34.5	LOS C	7.5	53.1	0.63	0.72	0.63	25.9
6	R2	All MCs	302	2.2	302	2.2	0.937	87.8	LOS F	26.4	187.9	1.00	1.01	1.24	20.5
Approach			468	1.7	468	1.7	0.937	68.9	LOS E	26.4	187.9	0.87	0.91	1.02	21.7
North: Forest Way (N)															
7	L2	All MCs	273	2.9	273	2.9	* 0.952	35.3	LOS C	71.5	513.3	0.97	0.99	1.10	28.7
8	T1	All MCs	1966	3.1	1966	3.1	0.952	48.0	LOS D	72.2	518.5	0.97	1.01	1.12	18.3
Approach			2239	3.0	2239	3.0	0.952	46.5	LOS D	72.2	518.5	0.97	1.01	1.12	20.2
All Vehicles			5135	3.4	5135	3.4	0.952	31.4	LOS C	72.2	518.5	0.68	0.69	0.76	27.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Override Site Data 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)

ANNEXURE D: SWEPT PATH TESTING
(2 SHEETS)



15.5M LONG ARTICULATED VEHICLE (AV)

Blue – Tyre Path

Green – Vehicle Body

Red – 300mm Clearance

MCLAREN TRAFFIC ENGINEERING
A division of RAMTRANS Australia Pty. Ltd.

Shop 7, 716-720 Old Princes Hwy, Sutherland NSW 2232
P : (02) 9521 7199

E : admin@mclarentraffic.com.au
www.mclarentraffic.com.au

CLIENT / Project:
REVELOP

Project Address:
20 Forest Way, Frenchs Forest NSW 2086

Notes:
CONCEPT PLAN ONLY.
NOT FOR CONSTRUCTION.

Tested Using:
*AutoTURN 11
*ZWCAD 2019 Professional Edition

Drawing Title:
15.5M Site S Access / Egress

Project No:	Drawing No:
2021/0112	2021-0112-A

Revision	Date	Details
A	26/09/2023	SPTesting (Detail Design Recquired)