



**TRAFFIC AND PARKING IMPACT ASSESSMENT OF
PROPOSED RE-ZONING AND RETAIL/COMMERCIAL AND RESIDENTIAL
DEVELOPMENT
AT APPIN ROAD & KELLERMAN DRIVE, ST HELENS PARK**



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Development Type: Proposed Re-Zoning and Retail/Commercial and Residential Development

Site Address: Appin Road & Kellerman Drive, St Helens Park

Prepared for: Premise

Document reference: 200578.01FA

Status	Issue	Prepared By	Checked By	Date
Draft	A	SI/DW	TS	2 nd February 2021
Draft	B	DW/TS	TS	2 nd March 2021
Final	A	DW	TS	5 th March 2021

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1 **INTRODUCTION**

McLaren Traffic Engineering was commissioned by Premise to provide a traffic and parking impact assessment of the Proposed Re-Zoning and Retail/Commercial and Residential Development at Appin Road & Kellerman Drive, St Helens Park with concept layout depicted in **Annexure A**.

1.1 Description and Scale of Development

The concept development scale has the following characteristics relevant to traffic and parking:

- 200m² GFA Service Station Shop (Existing);
- 660m² GFA Neighbourhood Supermarket;
- Two (2) x 160m² GFA Take Away Restaurants;
- 270m² GFA Neighbourhood shops;
- 210m² GFA Restaurant;
- 240m² GFA Gymnasium;
- Eleven (11) units consisting of:
 - Two (2) x one-bedroom apartments;
 - Nine (9) x two-bedroom apartments.
- Ground level and basement level car park with existing vehicular access via a two-way driveway from Kellerman Drive and separated entry and exit driveways from Appin Road, accommodating a total of **121** car spaces.

1.2 State Environmental Planning Policy (Infrastructure) 2007

The proposed development has frontage to a classified road with reference to Clause 101 of SEPP (Infrastructure) 2007. The development therefore must satisfy that:

the safety, efficiency, and ongoing operation of the classified road will not be adversely affected by the development as a result of:

- a. the design of the vehicular access to the land.*
- b. the emission of smoke or dust from the development*
- c. the nature, volume or frequency of vehicles using the classified road to gain access to the land.*

The subject site has access via Appin Road, a TfNSW classified road (MR. 177). Accordingly, formal referral to *Transport for New South Wales (TfNSW)* is necessary in conjunction with *Campbelltown City Council* officers.

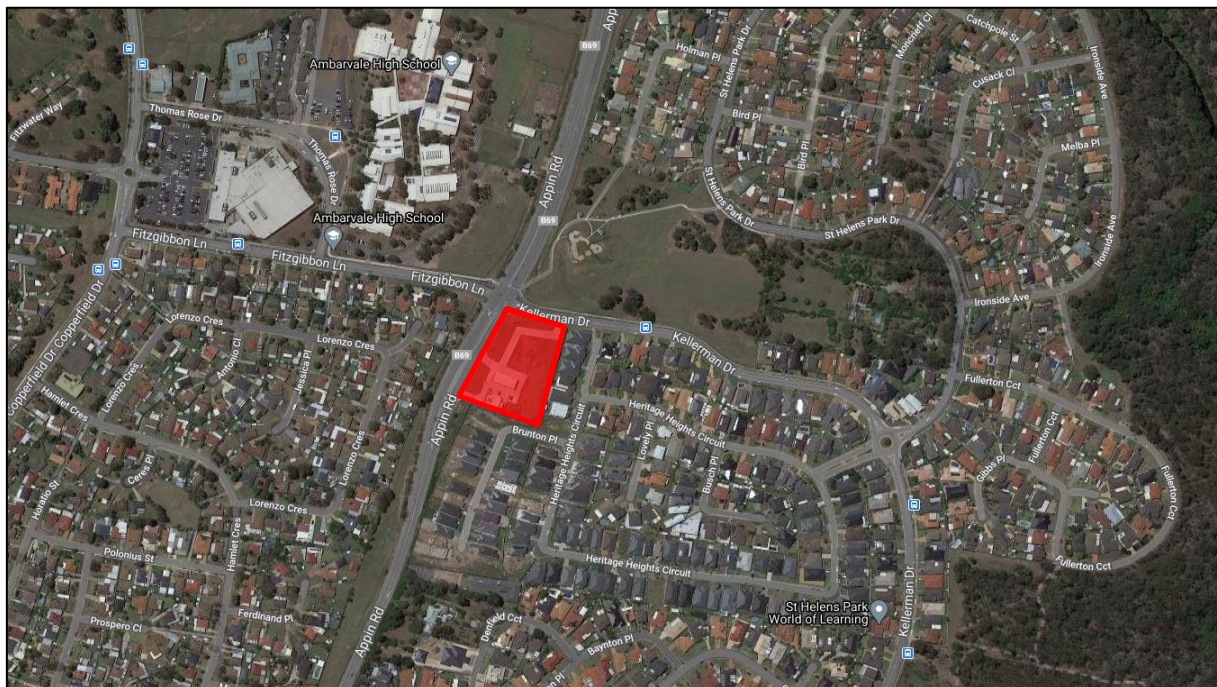
1.3 Site Description

The subject site is currently zoned *R2 – Low Density* under the *Campbelltown Local Environmental Plan 2015* with proposal to change the zoning to *B1 – Neighbourhood Centre*.

The site currently has an existing service station which is to be retained and unchanged. The subject site is generally surrounded by low to medium density residential dwellings in all directions. Ambarvale High School is located approximately 200m northwest of the site.

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 Appin Road

- RMS Classified STATE Road (No. 177);
- Approximately 23m wide carriageway facilitating two traffic flow lanes and cycling lanes in each direction separated by a 1.5m wide median;
- Signposted 70km/h speed limit southbound and 80km/h speed limit northbound;
- No kerbside parking available along either side of the road.

2.1.2 Kellerman Drive

- Unclassified COLLECTOR Road;
- Approximately 12m wide carriageway facilitating one traffic flow lane in each direction and a dedicated cycling lane eastbound separated by a 1m wide median near the site. Kerbside parking is available further east of the site along the westbound lane;
- Signposted 60km/h speed limit;
- Unrestricted kerbside parking available along the southern lane further east of the site.

2.1.3 Fitzgibbon Lane

- Unclassified LOCAL Road;
- Approximately 13m wide carriageway facilitating one traffic flow lane in each direction and kerbside parking;
- Signposted 60km/h speed limit;
- 40km/h speed limit applies during school zone hours;
- Unrestricted kerbside parking available along both sides of the street further west of the site.

2.2 *Existing Traffic Management*

- Signalised intersection of Appin Road / Kellerman Drive / Fitzgibbon Lane.

2.3 *Existing Traffic Volumes*

Turning movement count surveys were conducted at the intersections of Appin Road / Kellerman Drive / Fitzgibbon Lane, Kellerman Drive / Site Access, Appin Road / Site Access Driveway and Appin Road / Site Egress Driveway from 7:00 AM to 10:00 AM and 2:00 PM to 6:00 PM on Thursday the 10th of December 2020, representing a typical operating weekday. The full survey results are shown in **Annexure B** for reference.

2.3.1 Existing Road Performance

The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.0, **Table 1** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure C**.

TABLE 1: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/vehicle)	Level of Service ⁽³⁾⁽⁴⁾	Control Type	Worst Movement
EXISTING PERFORMANCE						
Appin Rd / Fitzgibbon Ln	AM	0.81	33.7	C	Signals	RT from Appin Rd (S)
	PM	0.61	29.7	C		RT from Appin Rd (S)
Site Access / Kellerman Dr	AM	0.15	NA (Worst: 5.6)	N/A (Worst: A)	Give Way	LT from Kellerman Dr (E)
	PM	0.16	NA (Worst: 5.6)	N/A (Worst: A)		LT from Kellerman Dr (E)
Appin Road / Appin Road	AM	0.22	NA (Worst: 3.5)	N/A (Worst: A)	Give Way	LT from Appin Road (N)
	PM	0.21	NA (Worst: 3.5)	N/A (Worst: A)		LT from Appin Road (N)
Appin Road / Site Exit	AM	0.43	NA (Worst: 6.3)	N/A (Worst: A)	Give Way	LT from Site Exit (E)
	PM	0.33	NA (Worst: 7.5)	N/A (Worst: A)		LT from Site Exit (E)

NOTES:

(1) Degree of Saturation is the ratio of demand to capacity for the most disadvantaged movement.

(2) Average delay is the delay experienced on average by all vehicles. The value in brackets represents the delay to the most disadvantaged movement.

(3) 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.

As shown above, the two relevant intersections and driveways are currently performing at a satisfactory efficiency, with a level of service “A” to “C” conditions in both the AM & PM peak hour periods. The level of service “A” to “C” performance is considered an acceptable level of delay.

3 PARKING ASSESSMENT

Reference is made to Reference is made to *Campbelltown (Sustainable City) Development Control Plan 2015* which designates the following parking rates applicable to the proposed development:

5.5 Residential Flat Buildings

5.5.4 Car Parking and Access

h) Each dwelling shall be provided with a minimum of one car parking space, and:

i) an additional car parking space for every 4 dwellings (or part thereof); and

ii) an additional visitor car parking space for every 10 dwellings (or part thereof).

6.4 General Requirements for Commercial Development

Table 6.4.2.1 Car Parking Rates

Service Station

1 space per 25m² plus 5 spaces per work bay (for vehicle servicing facilities)

Shops

Ground level, 1 space per 25m² GFA

Upper level(s), 1 space per 35m².

A restaurant or café

1.5 spaces per 10m²

Recreation facility Indoor

3 spaces per court/alley (where relevant); or

1 space per 25m² GFA

Take away food and drink premises

1.5 spaces per 20m² GFA

Table 2 presents the parking requirements of the proposal according to the Council's above car parking rates.

TABLE 2: DCP PARKING RATES

Land Use	Type	Scale	Rate	Parking Required	Parking Proposed
Residential	Resident	11	1.25 spaces per dwelling	13.8	121
	Visitor		1 space per 10 dwellings	1.1	
Existing Service Station	-	200m ²	1 space per 25m ²	8	
Shops	-	270m ²	1 space per 25m ²	10.8	
Supermarket	-	660m ²	1 space per 25m ²⁽¹⁾	26.4	
Restaurant	-	210m ²	1.5 spaces per 10m ²	31.5	
Gymnasium	-	240m ²	1 space per 25m ²	9.6	
Take away restaurant	-	320m ²	1.5 spaces per 20m ²	24	
Total		-	-	125.2 (126)	121

Note: (1) Shops parking rate assumed

As shown above, strict application of the DCP requires a total **126** car parking spaces, with **14** for residential use and **112** for visitor use. The concept plans detail a total of **121** car parking spaces, resulting in a numerical shortfall of 5 parking spaces from Council's DCP requirements. It is noted that this parking requirement does not take into consideration multi-use trips which would act to reduce the total parking demand of the development.

The subject concept plans are subject to change, however it can be seen that the site could accommodate sufficient parking to serve a development of similar scale. Any development application for the proposed use of the site should be designed in accordance with Council's DCP car parking requirement.

3.1 Disabled Parking

Reference is made to Council's DCP which outlines the following requirements for disabled parking.

6.4 General Requirements for Commercial Developments

6.4.2.3 Access for People with Disabilities

b) Notwithstanding Clause 6.4.2.2 a) the required percentage of car parking spaces for people with disabilities within retail/commercial development shall be:

- i) one car space per development; plus*
- ii) one for every 20 car parking spaces;*

iii) and shall be designed in accordance with AS No 2890.6 (as amended).

The above rates result in disabled parking requirement of seven (7) disabled parking spaces designed in accordance with AS2890.6. Any development application for the proposed use of the site should be designed in accordance with Council's DCP disabled parking requirement.

3.2 Bicycle & Motorcycle Parking Requirements

Campbelltown Council DCP 2015 does not require the provision of motorcycle parking. No motorcycle parking is required to satisfy Council DCP requirements.

Campbelltown Council DCP requires that bicycle parking be provided at a rate of one (1) bicycle storage space per 5 dwellings within common property. This requirement results in a total of **3** bicycle storage spaces, which should be included in accordance with Council's DCP requirement.

3.3 Servicing & Loading

Reference is made to *Campbelltown Council's DCP 2015 Section 6.4.2.2 Loading and Unloading* which outlines the following with respect to loading requirements for commercial developments.

Each new commercial building/unit having a gross floor area:

- i) up to 200 square metres shall provide a loading area to allow for a small rigid vehicle to manoeuvre on site;*
- ii) more than 200 square metres, but up to 1500 square metres shall provide an area to allow for a medium rigid vehicle to manoeuvre on site; and*
- iii) more than 1500 square metres shall provide a loading area to allow for a heavy rigid vehicle to manoeuvre on site.*

Any development application for the proposed use of the site should be designed in accordance with Council's DCP loading requirement and include the existing requirement of service station.

3.4 Driveway Locations

3.4.1 Sight Lines

A sight line assessment of the existing driveways has been undertaken with the results presented in **Table 3** and a diagram of the measured sightlines provided in **Annexure E**.

TABLE 3: SIGHT LINE ASSESSMENT AT DRIVEWAYS

Driveway Connection	Frontage Speed	Direction	AS2890.1 SSD – 5s	SISD	Measured Distance
Kellerman Drive	60km/h	East	83m	123m	148m
		West			71m
Appin Road Egress driveway	70km/h	North	97m	151m	>250m

As shown above, the existing driveway connection to Kellerman Drive does not provide adequate sight distance for right turns out of the site in accordance with *AS2890.1:2004 Figure 3.2* or the Safe Intersection Sight Distance (SISD) requirements of *Austroads Guide to Road Design – Part 4A*.

3.4.2 Recommended Treatments

Noting the results of the sight distance assessment undertaken in **Section 3.4.1**, for the right turn movement out of the site onto Kellerman Drive to be maintained, some road upgrades must take place. To adequately separate turning traffic from through traffic along Kellerman Drive, a “Seagull” treatment including a 110m long acceleration lane facility is recommended and will be constructed prior to the occupation of any intensified use of the site.

The proposed upgrades would include:

- Road widening to facilitate lane widths of 3.5m;
- Line marking of a widened auxiliary right turn lane and a 110m long (50m full width, 60m taper length) acceleration lane in the form of a seagull treatment.

The existing and future (post-upgrade by TfNSW) formation of Kellerman Drive has been examined and is compatible with these proposed upgrades.

4 TRAFFIC ASSESSMENT

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

4.1 **Traffic Generation**

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

3.3 Residential

3.3.2 Medium density residential flat building

Smaller units and flats (up to two bedrooms):

Weekday peak hour vehicle trips = 0.4-0.5 per dwelling.

3.6 Retail

3.6.1 Shopping Centres

For Thursdays and Fridays, the models are for the vehicle trips in the evening peak hour - V(P) – where this period has been taken as 4.30-5.30 pm.

For Saturday morning, the peak vehicle hour has been used - PVT. This is typically 11.00 am-12.00 pm. Localised variations in these peak hours can occur.

*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(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.

3.7 Refreshments

3.7.1 Drive-in take away food outlets.

Rates - McDonalds.

Evening peak hour vehicle trips:

- assume 180 veh/hr for average development (mean of survey results).

Rates - Kentucky Fried Chicken.

Evening peak hour vehicle trips:

- assume 100 veh/hr for average development (mean of survey results).

3.7.2 Restaurants

Evening peak hour vehicle trips = 5 per 100 m² gross floor area

3.8 Recreational and Tourist Facilities

3.8.2 Gymnasiums

Metropolitan Sub Regional Areas.

Evening Peak Hour Vehicle Trips = 9 trips per 100m² GFA.

It should be noted that for the purposes of assessment and for a conservative result it is assumed that both of the proposed drive-in take away food outlets have a traffic generation akin to *Kentucky Fried Chicken* during the evening peak hour.

The resulting traffic generation is summarised in **Table 4**.

TABLE 4: ESTIMATED TRAFFIC GENERATION

Use	Scale	Generation Rate	PM peak hour trips in to / out of site	Additional PM peak hour Trips
Existing Service Station	200m ²	-	138 (68 in; 70 out) ⁽¹⁾	0 additional trips (existing)
Residential	11 units	0.5 per unit	6 (5 in; 1 out) ⁽²⁾	6 (5 in; 1 out) ⁽²⁾
Shops	270m ²	4.6 per 100m ²⁽³⁾	12 (6 in; 6 out) ⁽⁴⁾	12 (6 in; 6 out) ⁽⁴⁾
Supermarket	660m ²	15.5 per 100m ²	102 (51 in; 51 out) ⁽⁴⁾	102 (51 in; 51 out) ⁽⁴⁾
Restaurant	210m ²	5 per 100 m ²	11 (5 in; 6 out) ⁽⁴⁾	11 (5 in; 6 out) ⁽⁴⁾
Gymnasium	240	9 per 100m ²	22 (11 in; 11 out) ⁽⁴⁾	22 (11 in; 11 out) ⁽⁴⁾
Take away restaurant ⁽⁵⁾	2 restaurants	100 per restaurant (50% passing trade)	200 (100 in; 100 out) ⁽⁴⁾	100 (50 in; 50 out) ⁽⁴⁾⁽⁵⁾
Total	-	-	491 (246 in; 245 out)	253 (128 in; 125 out)

- Note:
- (1) Based on traffic surveys.
 - (2) Assumes 20% inbound & 80% outbound during AM peak: Vice versa for PM.
 - (3) Assumed specialty shop traffic generation rate.
 - (4) Assumes 50% inbound & 50% outbound during AM & PM peak.
 - (5) Assumed each restaurant operates with a similar traffic generation as a KFC as per RTA Guide.
 - (5) Subtracting passing trade.

As shown, the maximum traffic generation associated with the proposed development is in the order of **491** (246 in; 245 out) vehicle trips. Of those, **253** (128 in; 125 out) would be additional trips to the network while **238** (118 in; 120 out) are considered existing trips or passing trade.

4.2 Trip Assignment

The traffic assignment that has been assumed for the subject site is based on the existing traffic distribution from the surveyed data. The assumptions that have been made for the trip assignment of the subject development are:

- Additional trips:
 - Drivers will arrive either from the north, south, east or west in proportion with the existing traffic flows as recorded in the survey data;
 - Drivers will depart to the direction they arrive to the site.
- Passing trade:
 - Drivers will arrive either from the north, south, east or west in proportion with the existing traffic flows as recorded in the survey data;

- Drivers will continue their trip along the direction they were travelling prior to entering the subject site.
- Existing Traffic
 - Drivers will arrive and depart the site as per the existing operation of the site.

4.3 Intersection Upgrade

As discussed in **Section 2.5** above, the intersection of Appin Road / Fitzgibbon Lane / Kellerman Drive will be upgraded as part of the Appin Road upgrade between Rosemeadow and Mt Gilead. The plans of the TfNSW intersection upgrade are presented in **Annexure D** with the following additions relevant to note:

- A dedicated right turn lane from Appin Road (north);
- A dedicated right turn lane from Kellerman Drive;
- Extended right turn lane from Appin Road South;
- Increase to three (3) approach and departure through lanes on the southern leg of Appin Road;
- A left slip lane from Appin Road (south) to Fitzgibbon Lane;
- A left slip lane from Fitzgibbon Lane to Appin Road (north);
- Staged pedestrian crossing on the southern and northern leg of Appin Road.

4.4 Traffic Impact

The traffic generation outlined in **Section 4.1 & 4.2** above has been added to the existing traffic volumes recorded as well as the upgraded intersection layout discussed in **Section 4.3**. SIDRA INTERSECTION 9.0 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 5**.

SIDRA INTERSECTION 9.0 was also used to assess the 2031 future road conditions with background growth as per the TfNSW strategic traffic forecasting model shown in **Annexure F**. The results of the 2031 intersection performance with the proposed development is summarised in **Table 5** with detailed movement summaries reproduced in **Annexure C**.

As shown below, the intersection of Appin Road / Fitzgibbon Lane / Kellerman Drive increases from Level of Service (LoS) 'B' to LoS 'C' under the future scenario and retains LoS 'C' in the 2031 conditions from the future conditions. While an increase from LoS 'B' to LoS 'C' is observed with the future intersection layout, the increase to the average delay is only 4.6s such that the intersection is currently operating at the upper delay of LoS 'B' and the proposed development pushes the intersection into the lower delay of 'LoS 'C'. Therefore, the proposed development does not have a significant impact on the subject intersection.

The site driveways all retain the same overall Level of Service for the worst movements, being LoS 'A' under future conditions with minimal delays and additional capacity. Therefore,

the proposed development will have negligible impact on the existing road network as a result of the proposed development.

TABLE 5: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/vehicle)	Level of Service ⁽³⁾⁽⁴⁾	Control Type	Worst Movement
EXISTING LAYOUT – EXISTING VOLUMES PERFORMANCE						
Appin Rd / Fitzgibbon Ln	PM	0.61	29.7	C	Signals	RT from Appin Rd (S)
Site Access / Kellerman Dr		0.16	NA (Worst: 5.6)	N/A (Worst: A)	Give Way	LT from Kellerman Dr (E)
Appin Road / Site Entry		0.21	NA (Worst: 3.5)	N/A (Worst: A)	Give Way	LT from Appin Road (N)
Appin Road / Site Exit		0.33	NA (Worst: 7.5)	N/A (Worst: A)	Give Way	LT from Site Exit (E)
EXISTING LAYOUT – FUTURE VOLUMES PERFORMANCE						
Appin Rd / Fitzgibbon Ln	PM	0.82	30.7	C	Signals	RT from Appin Rd (S)
Site Access / Kellerman Dr		0.26	NA (Worst: 5.6)	NA (Worst: A)	Give Way	LT from Kellerman Dr (E)
Appin Road / Site Entry		0.24	NA (Worst: 3.5)	NA (Worst: A)	Give Way	LT from Appin Road (N)
Appin Road / Site Exit		0.33	NA (Worst: 7.5)	NA (Worst: A)	Give Way	LT from Site Exit (E)
FUTURE LAYOUT – EXISTING VOLUMES PERFORMANCE						
Appin Rd / Fitzgibbon Ln	PM	0.53	24.2	B	Signals	RT from Appin Rd (S)
Site Access / Kellerman Dr		0.12	NA (Worst: 5.6)	N/A (Worst: A)	Give Way	LT from Kellerman Dr (E)
Appin Road / Site Entry		0.14	NA (Worst: 3.5)	N/A (Worst: A)	Give Way	LT from Appin Road (N)
Appin Road / Site Exit		0.15	NA (Worst: 6)	N/A (Worst: A)	Give Way	LT from Site Exit (E)
FUTURE LAYOUT – FUTURE VOLUMES PERFORMANCE						
Appin Rd / Fitzgibbon Ln	PM	0.64	28.8	C	Signals	RT from Appin Rd (S)
Site Access / Kellerman Dr		0.17	NA (Worst: 5.6)	NA (Worst: A)	Give Way	LT from Kellerman Dr (E)
Appin Road / Site Entry		0.16	NA (Worst: 3.5)	NA (Worst: A)	Give Way	LT from Appin Road (N)
Appin Road / Site Exit		0.13	NA (Worst: 6.6)	NA (Worst: A)	Give Way	LT from Site Exit (E)
FUTURE LAYOUT – 2031 VOLUMES PERFORMANCE						
Appin Rd / Fitzgibbon Ln	PM	0.76	33.7	C	Signals	RT from Appin Rd (S)
Site Access / Kellerman Dr		0.28	NA (Worst: 8.3)	NA (Worst: A)	Give Way	RT from Site Access (S)
Appin Road / Site Entry		0.18	NA (Worst: 3.5)	NA (Worst: A)	Give Way	LT from Appin Road (S)
Appin Road / Site Exit		0.15	NA (Worst: 6.8)	NA (Worst: A)	Give Way	LT from Site Exit (E)

Notes: Refer to Table 1 Notes

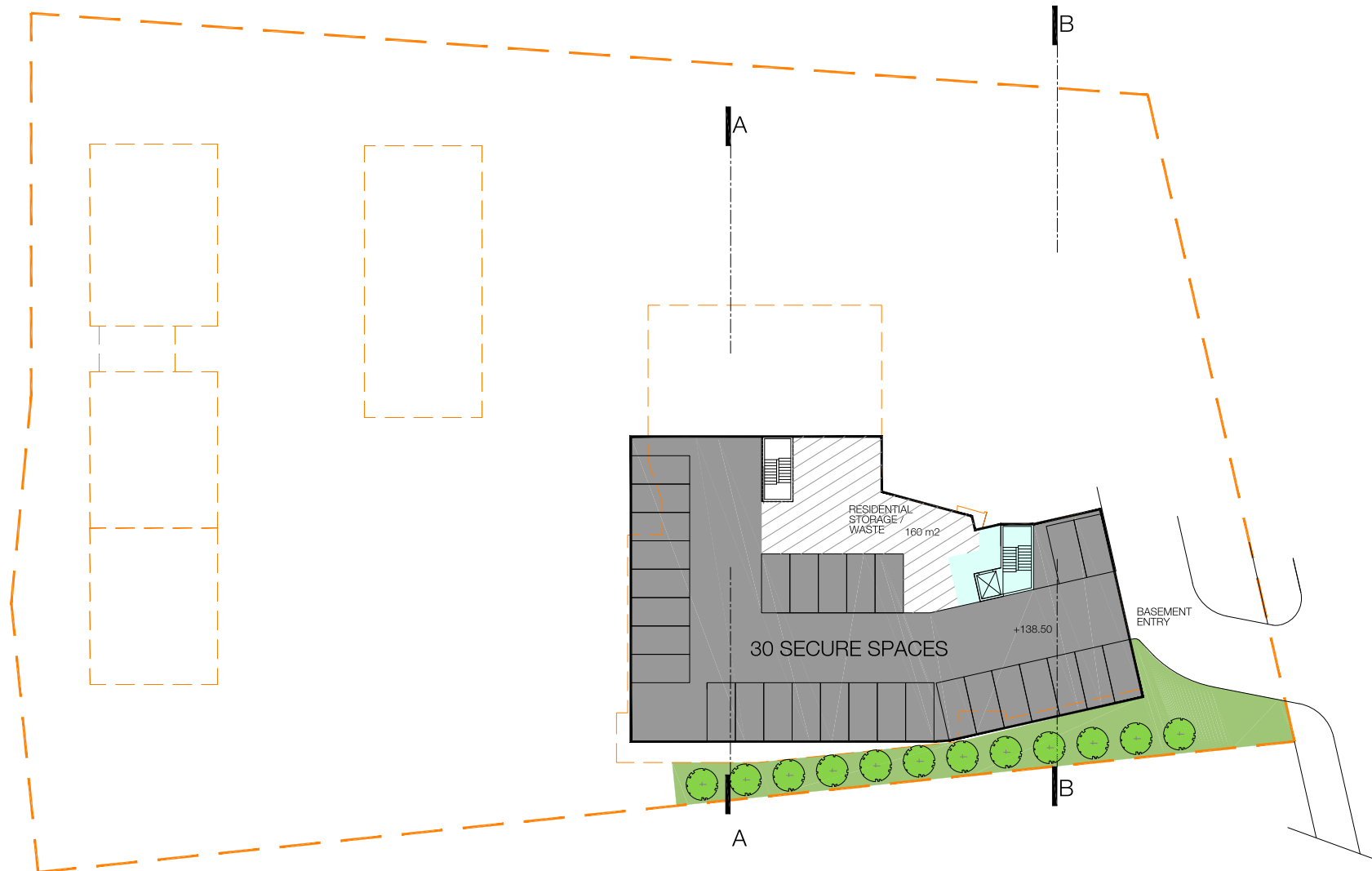
5 CONCLUSION

In view of the foregoing, the subject Proposed Re-Zoning and Retail/Commercial and Residential Development proposal at Appin Road & Kellerman Drive, St Helens Park (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 proposed site would be able to accommodate compliant parking numbers and dimensions in accordance with Council's DCP and Australian Standard requirements which would be subject to a separate development application.
- A future development application for the proposed use of the site should be designed in accordance with Council's DCP loading requirement and include the existing requirement of service station.
- The existing driveway along Kellerman Drive provides inadequate sight lines for right turning egressing vehicles. To adequately separate turning traffic from through traffic along Kellerman Drive, a "Seagull" treatment including a 110m long acceleration lane facility is recommended and will be constructed prior to the occupation of any intensified use of the site. The existing and future (post-upgrade by TfNSW) formation of Kellerman Drive has been examined and is compatible with these proposed upgrades.
- The traffic generation of the proposed development has been estimated to be some **491** (246 in; 245 out) vehicle trips of that **253** (128 in; 125 out) would be additional trips to the network while **238** (118 in; 120 out) are considered existing trips or passing trade. The impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.0, indicating that there will be no detrimental impact to the performance of the intersections or surrounding the site as a result of the generated traffic.



**ANNEXURE A: CONCEPT PLANS
(2 SHEETS)**



GROUND FLOOR SCHEDULE

FUEL (EXISTING)	200m2
NEIGHBOURHOOD SUPERMARKET	660m2
TAKE AWAY (x2)	320m2
NEIGHBOURHOOD SHOPS (x4)	270m2
RESTAURANT	210m2
ON-GRADE PARKING	91 SPACES





**ANNEXURE B: TRAFFIC SURVEY DATA
(5 SHEETS)**

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY



trafficsurvey.com.au



Intersection of Kellerman Dr and Appin Rd, St Helens Park

GPS -34.10218, 150.8023

Date:	Thu 10/12/20
Weather:	Overcast
Suburban:	St Helens Park
Customer:	McLaren

North:	Appin Rd
East:	Kellerman Dr
South:	Appin Rd
West:	Fitzgibbon Ln

Survey	AM: 7:00 AM-10:00 AM
Period	PM: 2:00 PM-6:00 PM
Traffic	AM: 8:00 AM-9:00 AM
Peak	PM: 2:45 PM-3:45 PM

All Vehicles

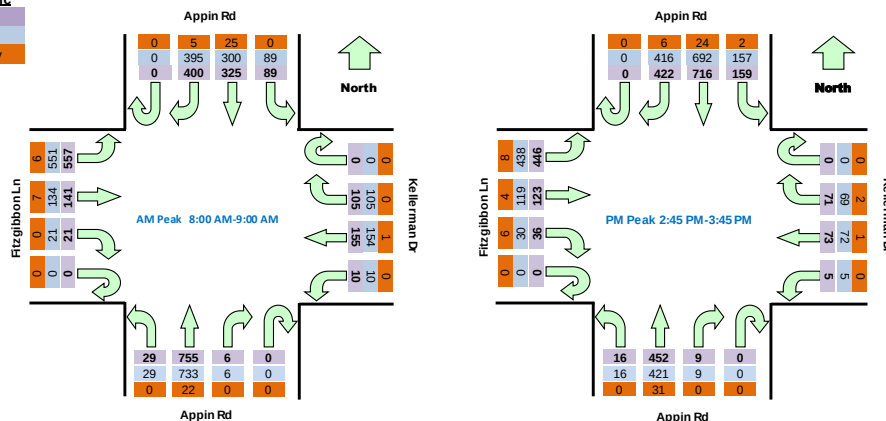
Time		North Approach Appin Rd				East Approach Kellerman Dr				South Approach Appin Rd				West Approach Fitzgibbon Ln				Hourly Total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L	Hour	Peak
7:00	7:15	0	40	65	8	0	25	14	0	0	0	133	0	0	0	7	77	1810	
7:15	7:30	0	38	80	7	0	29	6	1	0	0	151	4	0	6	9	71	2070	
7:30	7:45	0	48	85	13	0	27	10	2	0	0	203	3	0	1	4	77	2333	
7:45	8:00	0	82	72	16	0	29	16	1	0	1	232	7	0	3	15	92	2540	
8:00	8:15	0	95	89	26	0	22	24	2	0	0	215	14	0	3	21	118	2593	Peak
8:15	8:30	0	107	96	27	0	18	48	2	0	0	191	6	0	2	28	140	2485	
8:30	8:45	0	93	65	14	0	36	50	2	0	2	188	6	0	8	54	162	2216	
8:45	9:00	0	105	75	22	0	29	33	4	0	4	161	3	0	8	38	137	1917	
9:00	9:15	0	85	90	15	0	27	24	0	0	6	126	3	0	2	23	120	1662	
9:15	9:30	0	48	83	16	0	22	19	0	0	2	106	1	0	5	11	83		
9:30	9:45	0	58	79	9	0	20	11	0	0	1	107	3	0	1	9	83		
9:45	10:00	0	47	93	17	0	24	6	3	0	1	93	3	0	7	14	56		
14:00	14:15	0	58	115	29	0	11	15	1	0	0	87	4	0	6	13	64	1961	
14:15	14:30	0	96	114	29	0	16	16	3	0	0	89	3	0	1	16	63	2217	
14:30	14:45	0	78	139	36	0	17	19	2	0	0	108	4	0	6	16	92	2469	
14:45	15:00	0	107	181	35	0	14	25	0	0	2	102	6	0	8	26	89	2528	Peak
15:00	15:15	0	115	182	53	0	22	17	1	0	2	104	0	0	17	39	107	2499	
15:15	15:30	0	107	201	26	0	14	19	1	0	3	121	6	0	5	40	155	2388	
15:30	15:45	0	93	152	45	0	21	12	3	0	2	125	4	0	6	18	95	2266	
15:45	16:00	0	109	190	36	0	19	14	2	0	1	101	5	0	5	10	74	2264	
16:00	16:15	0	81	195	28	0	14	6	0	0	0	98	5	0	8	24	89	2269	
16:15	16:30	0	94	203	35	0	20	16	3	0	0	109	3	0	7	32	54	2354	
16:30	16:45	0	83	183	41	0	30	16	0	0	2	115	3	0	4	23	74	2337	
16:45	17:00	0	106	185	37	0	25	19	1	0	3	97	2	0	4	18	74	2369	
17:00	17:15	0	134	204	54	0	17	15	0	0	1	102	3	0	3	22	78	2421	
17:15	17:30	0	80	162	46	0	25	13	1	0	1	124	2	0	6	19	80		
17:30	17:45	0	132	184	48	0	23	11	0	0	1	95	5	0	1	24	82		
17:45	18:00	0	104	208	40	0	31	17	1	0	1	125	2	0	1	18	75		

Peak Time		North Approach Appin Rd				East Approach Kellerman Dr				South Approach Appin Rd				West Approach Fitzgibbon Ln				Peak total	
Period Start	Period End	U	R	SB	L	U	R	WB	L	U	R	NB	L	U	R	EB	L		
8:00	9:00	0	400	325	89	0	105	155	10	0	6	755	29	0	21	141	557	2593	
14:45	15:45	0	422	716	159	0	71	73	5	0	9	452	16	0	36	123	446	2528	

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

Graphic

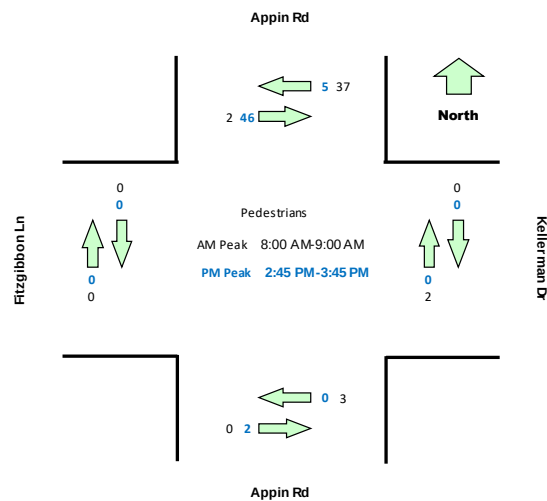
Total
Light
Heavy

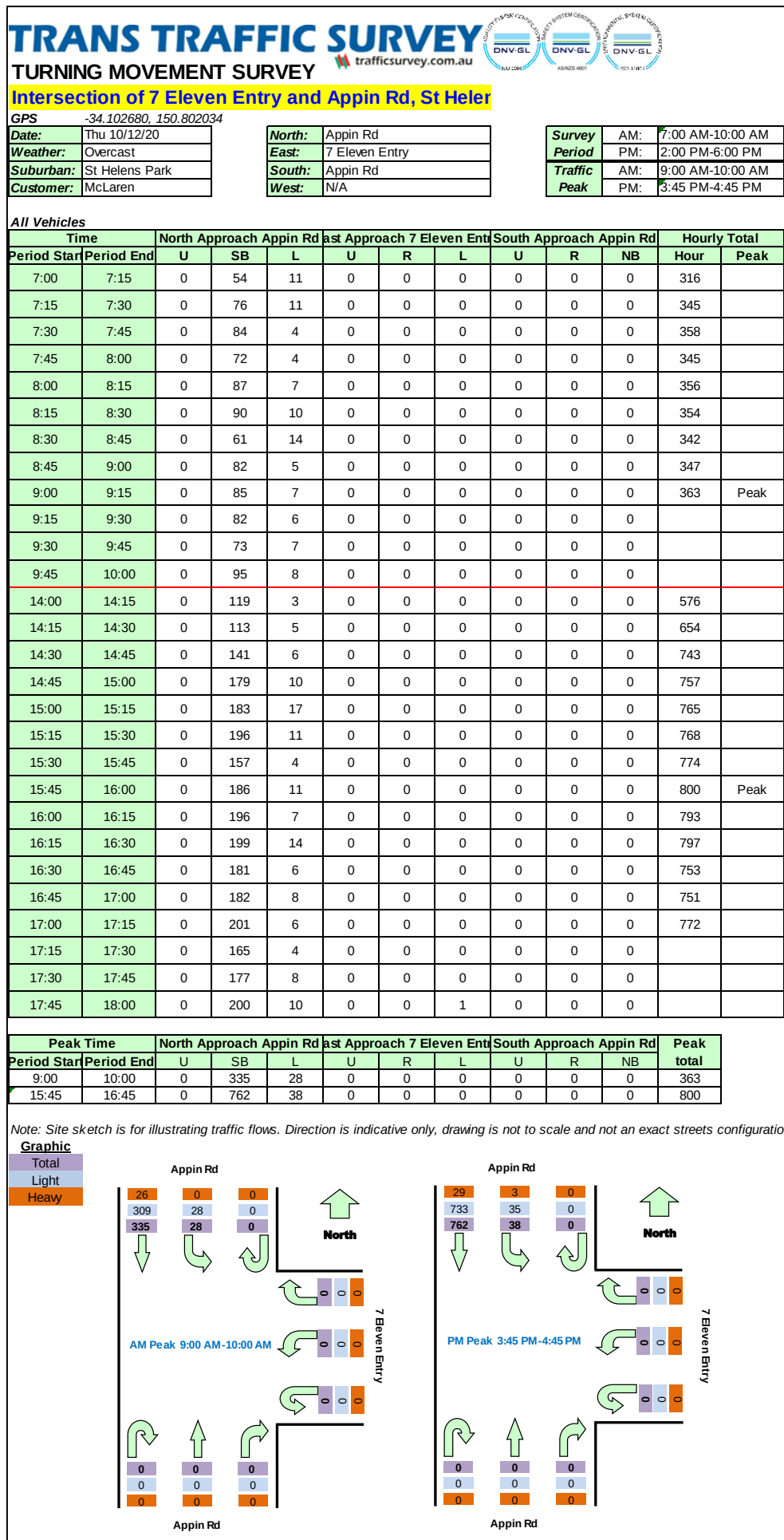


Pedestrians Crossing

Time		North Approach Appin Rd		East Approach Kellerman Dr		South Approach Appin Rd		West Approach Fitzgibbon Ln		Hourly Total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	
7:00	7:15	0	0	0	0	0	0	0	0	9
7:15	7:30	1	0	0	0	0	0	0	0	16
7:30	7:45	3	1	0	0	0	0	0	0	35
7:45	8:00	3	1	0	0	0	0	0	0	39
8:00	8:15	5	0	0	0	2	0	0	0	44
8:15	8:30	19	0	0	0	1	0	0	0	39
8:30	8:45	6	0	0	2	0	0	0	0	23
8:45	9:00	7	2	0	0	0	0	0	0	17
9:00	9:15	2	0	0	0	0	0	0	0	13
9:15	9:30	3	1	0	0	0	0	0	0	
9:30	9:45	1	0	0	0	0	1	0	0	
9:45	10:00	2	3	0	0	0	0	0	0	
14:00	14:15	0	1	0	0	0	0	0	0	28
14:15	14:30	0	0	0	0	0	0	0	0	35
14:30	14:45	0	0	0	0	0	0	0	0	44
14:45	15:00	0	26	0	0	0	1	0	0	53
15:00	15:15	0	8	0	0	0	0	0	0	30
15:15	15:30	2	6	0	0	0	1	0	0	25
15:30	15:45	3	6	0	0	0	0	0	0	22
15:45	16:00	2	1	0	0	0	1	0	0	16
16:00	16:15	3	0	0	0	0	0	0	0	12
16:15	16:30	2	2	0	1	0	1	0	0	11
16:30	16:45	0	2	0	0	1	0	0	0	9
16:45	17:00	0	0	0	0	0	0	0	0	7
17:00	17:15	0	1	0	0	1	0	0	0	12
17:15	17:30	0	0	2	2	0	0	0	0	
17:30	17:45	1	0	0	0	0	0	0	0	
17:45	18:00	4	0	0	0	1	0	0	0	

Peak Time		North Approach Appin Rd		East Approach Kellerman Dr		South Approach Appin Rd		West Approach Fitzgibbon Ln		Peak hour total
Period Start	Period End	Westbound	Eastbound	Southbound	Northbound	Westbound	Eastbound	Southbound	Northbound	
8:00	9:00	37	2	0	2	3	0	0	0	44
14:45	15:45	5	46	0	0	0	2	0	0	53





TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of 7 Eleven Exit and Appin Rd, St Helens

GPS -34.10312, 150.80179

Date:	Thu 10/12/20
Weather:	Overcast
Suburban:	St Helens Park
Customer:	McLaren

North:	Appin Rd
East:	7 Eleven Exit
South:	Appin Rd
West:	N/A

Survey	AM: 7:00 AM-10:00 AM
Period	PM: 2:00 PM-6:00 PM
Traffic	AM: 7:30 AM-8:30 AM
Peak	PM: 3:45 PM-4:45 PM

All Vehicles

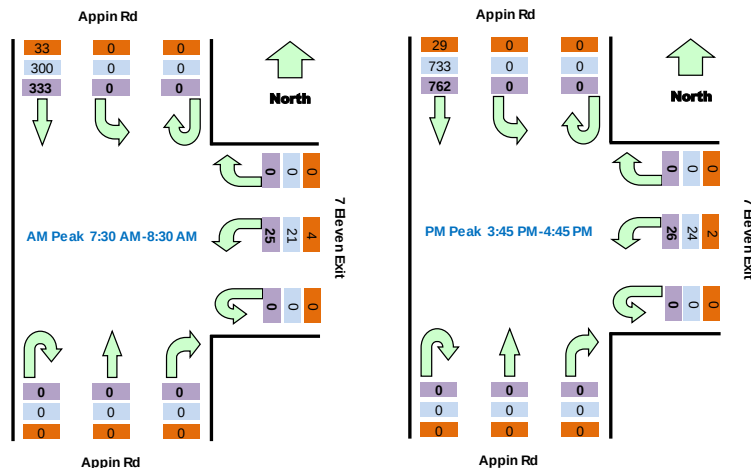
Time		North Approach Appin Rd			East Approach 7 Eleven Exit			South Approach Appin Rd			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
7:00	7:15	0	54	0	0	0	9	0	0	0	315	
7:15	7:30	0	76	0	0	0	8	0	0	0	346	
7:30	7:45	0	84	0	0	0	8	0	0	0	358	Peak
7:45	8:00	0	72	0	0	0	4	0	0	0	336	
8:00	8:15	0	87	0	0	0	7	0	0	0	350	
8:15	8:30	0	90	0	0	0	6	0	0	0	345	
8:30	8:45	0	61	0	0	0	9	0	0	0	337	
8:45	9:00	0	82	0	0	0	8	0	0	0	344	
9:00	9:15	0	85	0	0	0	4	0	0	0	357	
9:15	9:30	0	82	0	0	0	6	0	0	0		
9:30	9:45	0	73	0	0	0	4	0	0	0		
9:45	10:00	0	95	0	0	0	8	0	0	0		
14:00	14:15	0	119	0	0	0	5	0	0	0	572	
14:15	14:30	0	113	0	0	0	1	0	0	0	643	
14:30	14:45	0	141	0	0	0	3	0	0	0	739	
14:45	15:00	0	179	0	0	0	11	0	0	0	756	
15:00	15:15	0	183	0	0	0	12	0	0	0	759	
15:15	15:30	0	196	0	0	0	14	0	0	0	768	
15:30	15:45	0	157	0	0	0	4	0	0	0	764	
15:45	16:00	0	186	0	0	0	7	0	0	0	788	Peak
16:00	16:15	0	196	0	0	0	8	0	0	0	784	
16:15	16:30	0	199	0	0	0	7	0	0	0	785	
16:30	16:45	0	181	0	0	0	4	0	0	0	747	
16:45	17:00	0	182	0	0	0	7	0	0	0	744	
17:00	17:15	0	201	0	0	0	4	0	0	0	761	
17:15	17:30	0	165	0	0	0	3	0	0	0		
17:30	17:45	0	177	0	0	0	5	0	0	0		
17:45	18:00	0	200	1	0	0	5	0	0	0		

Peak Time		North Approach Appin Rd			East Approach 7 Eleven Exit			South Approach Appin Rd			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
7:30	8:30	0	333	0	0	0	25	0	0	0	358
15:45	16:45	0	762	0	0	0	26	0	0	0	788

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



TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY

trafficsurvey.com.au



Intersection of Kellerman Dr and 7 Eleven Access, S

GPS -34.10236, 150.803

Date:	Thu 10/12/20
Weather:	Overcast
Suburban:	St Helens Park
Customer:	McLaren

North:	N/A
East:	Kellerman Dr
South:	7 Eleven Access
West:	Kellerman Dr

Survey	AM:	7:00 AM-10:00 AM
Period	PM:	2:00 PM-6:00 PM
Traffic	AM:	8:00 AM-9:00 AM
Peak	PM:	2:45 PM-3:45 PM

All Vehicles

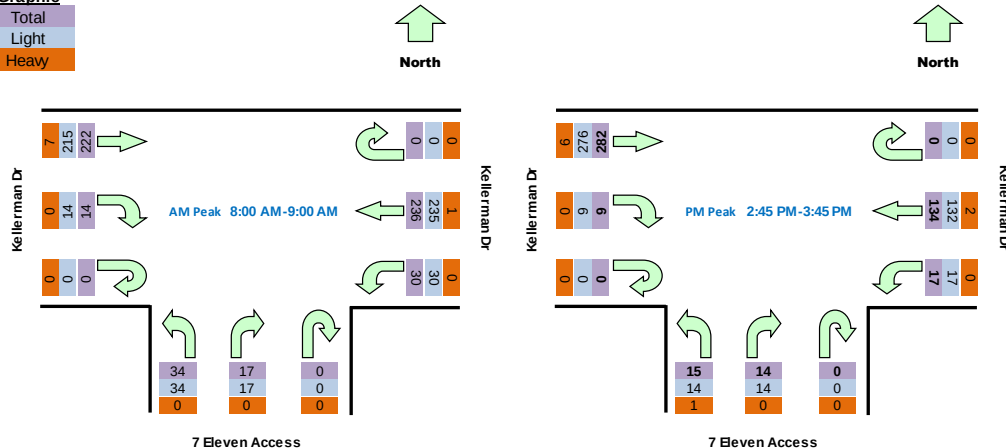
Time		East Approach Kellerman Dr			West Approach 7 Eleven Access			West Approach Kellerman Dr			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
7:00	7:15	0	28	7	0	1	11	0	0	15	272	
7:15	7:30	0	32	2	0	3	4	0	1	15	318	
7:30	7:45	0	35	9	0	1	4	0	1	16	395	
7:45	8:00	0	39	7	0	2	7	0	4	28	499	
8:00	8:15	0	38	8	0	5	10	0	3	44	553	Peak
8:15	8:30	0	60	8	0	3	8	0	2	53	552	
8:30	8:45	0	80	8	0	4	8	0	5	65	488	
8:45	9:00	0	58	6	0	5	8	0	4	60	374	
9:00	9:15	0	46	5	0	7	5	0	2	42	303	
9:15	9:30	0	37	0	0	0	4	0	1	28		
9:30	9:45	0	29	3	0	3	2	0	1	18		
9:45	10:00	0	28	5	0	0	5	0	2	30		
14:00	14:15	0	25	3	0	1	2	0	0	42	357	
14:15	14:30	0	34	0	0	1	1	0	1	44	433	
14:30	14:45	0	35	3	0	5	3	0	1	51	461	
14:45	15:00	0	36	3	0	0	3	0	2	61	471	Peak
15:00	15:15	0	36	8	0	7	4	0	3	91	451	
15:15	15:30	0	29	3	0	3	5	0	2	67	378	
15:30	15:45	0	33	3	0	4	3	0	2	63	379	
15:45	16:00	0	31	1	0	4	2	2	2	43	386	
16:00	16:15	0	20	2	0	2	0	0	0	52	411	
16:15	16:30	0	36	1	0	3	3	0	1	66	454	
16:30	16:45	0	41	1	0	2	5	0	3	63	460	
16:45	17:00	0	41	5	0	2	4	0	3	55	456	
17:00	17:15	0	29	5	0	5	3	0	2	75	463	
17:15	17:30	0	34	5	0	6	5	0	0	66		
17:30	17:45	0	34	0	0	4	0	0	3	70		
17:45	18:00	0	40	6	0	3	9	0	1	58		

Peak Time		East Approach Kellerman Dr			West Approach 7 Eleven Access			West Approach Kellerman Dr			Peak total
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	
8:00	9:00	0	236	30	0	17	34	0	14	222	553
14:45	15:45	0	134	17	0	14	15	0	9	282	471

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





**ANNEXURE C: SIDRA RESULTS
(30 SHEETS)**

MOVEMENT SUMMARY

 Site: 101 [Appin Rd / Kellerman Dr / Fitzgibbon Ln EX AM (Site Folder: Existing Layout and Existing Traffic)]  Network: N101 [Existing AM (Network Folder: General)]

Appin Road / Kellerman Drive / Fitzgibbon Lane

Existing conditions

AM peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Appin Rd (S)														
1	L2	31	0.0	31	0.0	0.785	50.5	LOS D	9.1	65.3	0.99	0.90	1.05	25.9
2	T1	795	2.9	795	2.9	* 0.785	45.9	LOS D	9.1	65.3	0.99	0.90	1.05	26.8
3	R2	6	0.0	6	0.0	0.068	64.8	LOS E	0.4	2.6	0.98	0.65	0.98	3.0
Approach		832	2.8	832	2.8	0.785	46.2	LOS D	9.1	65.3	0.99	0.90	1.05	26.6
East: Kellerman Dr (E)														
4	L2	11	0.0	11	0.0	0.180	41.7	LOS C	3.9	27.3	0.82	0.66	0.82	5.5
5	T1	163	0.6	163	0.6	* 0.795	47.6	LOS D	10.5	73.4	0.91	0.80	1.01	24.7
6	R2	111	0.0	111	0.0	0.795	58.4	LOS E	10.5	73.4	0.98	0.92	1.16	22.0
Approach		284	0.4	284	0.4	0.795	51.6	LOS D	10.5	73.4	0.93	0.84	1.06	23.2
North: Appin Rd (N)														
7	L2	94	0.0	94	0.0	0.210	20.3	LOS B	6.3	45.4	0.53	0.58	0.53	42.8
8	T1	342	7.7	342	7.7	0.210	14.0	LOS A	6.3	46.7	0.53	0.50	0.53	44.7
9	R2	421	1.3	421	1.3	* 0.807	32.5	LOS C	13.7	97.2	0.99	0.89	1.08	41.7
Approach		857	3.7	857	3.7	0.807	23.8	LOS B	13.7	97.2	0.76	0.70	0.80	42.6
West: Fitzgibbon Ln (W)														
10	L2	586	1.1	586	1.1	0.638	18.6	LOS B	18.6	131.1	0.59	0.77	0.59	45.0
11	T1	148	5.0	148	5.0	0.455	44.5	LOS D	8.8	63.8	0.92	0.76	0.92	24.5
12	R2	22	0.0	22	0.0	0.455	50.1	LOS D	8.8	63.8	0.92	0.76	0.92	24.5
Approach		757	1.8	757	1.8	0.638	24.6	LOS B	18.6	131.1	0.67	0.77	0.67	40.6
All Vehicles		2729	2.5	2729	2.5	0.807	33.7	LOS C	18.6	131.1	0.82	0.79	0.87	34.8

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

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

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

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped	Dist]					
					ped	m			sec	m	m/sec
South: Appin Rd (S)											
P1	Full	3	54.2	LOS E	0.0	0.0	0.95	0.95	223.4	220.0	0.98
East: Kellerman Dr (E)											
P2	Full	2	54.2	LOS E	0.0	0.0	0.95	0.95	218.1	213.1	0.98
North: Appin Rd (N)											
P3	Full	41	54.2	LOS E	0.1	0.1	0.95	0.95	223.3	219.8	0.98

West: Fitzgibbon Ln (W)											
P4 Full	1	54.2	LOS E	0.0	0.0	0.95	0.95	219.7	215.2	0.98	
All Pedestrians	47	54.2	LOS E	0.1	0.1	0.95	0.95	223.0	219.4	0.98	

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

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

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

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Organisation: MCLAREN TRAFFIC ENGINEERING | Licence: NETWORK / 1PC | Processed: Thursday, 21 January 2021 9:47:33 AM

Project: \\mteserver\mte storage\Jobs\2020\200578\MTE SIDRA\21 01 19 TS.sip9

MOVEMENT SUMMARY

Site: 104 [Appin Rd / Site Exit 2031 FUT PM - Future Layout
(Site Folder: Future Layout and 2031 FUT PM Traffic)]

Network: N101 [2031 Future
Layout Future PM Volumes
(Network Folder: General)]

Appin Rd / Site Exit
2031 Future volumes with future layout
PM peak period
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 11 years

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	546	7.2	546	7.2	0.098	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		546	7.2	546	7.2	0.098	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
East: Site Exit (E)														
4	L2	85	0.0	85	0.0	0.085	6.8	LOS A	0.3	2.2	0.36	0.62	0.36	52.5
Approach		85	0.0	85	0.0	0.085	6.8	LOS A	0.3	2.2	0.36	0.62	0.36	52.5
North: Appin Road (N)														
8	T1	852	4.1	852	4.1	0.149	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		852	4.1	852	4.1	0.149	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1483	5.0	1483	5.0	0.149	0.4	NA	0.3	2.2	0.02	0.04	0.02	59.1

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

MOVEMENT SUMMARY

Site: 102 [Kellerman Dr / Site Access EX AM (Site Folder: Existing Layout and Existing Traffic)]

Network: N101 [Existing AM (Network Folder: General)]

Kellerman Drive / Site Access
Existing Conditions
AM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Site Access (S)														
1	L2	36	0.0	36	0.0	0.089	0.8	LOS A	0.2	1.3	0.38	0.28	0.38	19.7
3	R2	18	0.0	18	0.0	0.089	3.8	LOS A	0.2	1.3	0.38	0.28	0.38	20.1
Approach		54	0.0	54	0.0	0.089	1.8	LOS A	0.2	1.3	0.38	0.28	0.38	19.9
East: Kellerman Dr (E)														
4	L2	32	0.0	32	0.0	0.145	5.6	LOS A	1.2	8.7	0.00	0.07	0.00	57.7
5	T1	248	0.4	248	0.4	0.145	0.0	LOS A	1.2	8.7	0.00	0.07	0.00	58.7
Approach		280	0.4	280	0.4	0.145	0.7	NA	1.2	8.7	0.00	0.07	0.00	58.5
West: Kellerman Dr (W)														
11	T1	234	3.2	234	3.2	0.123	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	15	0.0	15	0.0	0.011	4.5	LOS A	0.0	0.3	0.27	0.54	0.27	50.3
Approach		248	3.0	248	3.0	0.123	0.3	NA	0.0	0.3	0.02	0.03	0.02	59.3
All Vehicles		582	1.4	582	1.4	0.145	0.6	NA	1.2	8.7	0.04	0.07	0.04	48.5

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

Site: 103 [Appin Rd / Site Entry EX AM (Site Folder: Existing Layout and Existing Traffic)] Network: N101 [Existing AM (Network Folder: General)]

Appin Rd / Site Entry
Existing conditions
AM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	832	2.8	832	2.8	0.215	0.0	LOS A	9.1	65.3	0.00	0.00	0.00	59.9
Approach		832	2.8	832	2.8	0.215	0.0	NA	9.1	65.3	0.00	0.00	0.00	59.9
North: Appin Road (N)														
7	L2	38	5.6	38	5.6	0.101	3.5	LOS A	0.0	0.0	0.00	0.11	0.00	55.4
8	T1	337	7.2	337	7.2	0.101	0.0	LOS A	0.0	0.0	0.00	0.05	0.00	54.4
Approach		375	7.0	375	7.0	0.101	0.4	NA	0.0	0.0	0.00	0.06	0.00	54.9
All Vehicles		1206	4.1	1206	4.1	0.215	0.1	NA	9.1	65.3	0.00	0.02	0.00	57.4

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

Site: 104 [Appin Rd / Site Exit EX AM (Site Folder: Existing Layout and Existing Traffic)]

Network: N101 [Existing AM (Network Folder: General)]

Appin Rd / Site Exit
Existing conditions
AM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	832	2.8	832	2.8	0.434	0.2	LOS A	5.2	36.9	0.00	0.00	0.00	59.7
Approach		832	2.8	832	2.8	0.434	0.2	NA	5.2	36.9	0.00	0.00	0.00	59.7
East: Site Exit (E)														
4	L2	32	3.3	32	3.3	0.021	6.3	LOS A	0.1	0.6	0.14	0.54	0.14	53.0
Approach		32	3.3	32	3.3	0.021	6.3	LOS A	0.1	0.6	0.14	0.54	0.14	53.0
North: Appin Road (N)														
8	T1	337	7.2	337	7.2	0.150	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		337	7.2	337	7.2	0.150	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1200	4.0	1200	4.0	0.434	0.3	NA	5.2	36.9	0.00	0.01	0.00	59.4

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Appin Rd / Kellerman Dr / Fitzgibbon Ln EX PM (Site Folder: Existing Layout and Existing Traffic)]  Network: N101 [Existing PM (Network Folder: General)]

Appin Road / Kellerman Drive / Fitzgibbon Lane

Existing conditions

PM peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Appin Rd (S)														
1	L2	17	0.0	17	0.0	0.609	50.6	LOS D	8.8	65.3	0.96	0.81	0.96	25.8
2	T1	476	6.9	476	6.9	* 0.609	46.2	LOS D	8.8	65.3	0.96	0.80	0.96	26.7
3	R2	9	0.0	9	0.0	0.102	65.2	LOS E	0.6	3.9	0.98	0.67	0.98	2.9
Approach		502	6.5	502	6.5	0.609	46.7	LOS D	8.8	65.3	0.96	0.80	0.96	26.3
East: Kellerman Dr (E)														
4	L2	5	0.0	5	0.0	0.138	42.0	LOS C	2.9	20.2	0.82	0.64	0.82	5.5
5	T1	77	1.4	77	1.4	* 0.611	43.5	LOS D	5.5	39.5	0.86	0.69	0.87	26.1
6	R2	75	2.8	75	2.8	0.611	59.7	LOS E	5.5	39.5	0.99	0.81	1.03	21.4
Approach		157	2.0	157	2.0	0.611	51.2	LOS D	5.5	39.5	0.92	0.75	0.95	23.3
North: Appin Rd (N)														
7	L2	167	1.3	167	1.3	0.429	22.1	LOS B	15.1	107.8	0.62	0.63	0.62	41.6
8	T1	754	3.4	754	3.4	0.429	15.7	LOS B	15.3	110.0	0.62	0.58	0.62	43.0
9	R2	444	1.4	444	1.4	* 0.604	36.9	LOS C	20.5	145.0	0.85	0.84	0.85	39.7
Approach		1365	2.5	1365	2.5	0.604	23.4	LOS B	20.5	145.0	0.69	0.67	0.69	41.2
West: Fitzgibbon Ln (W)														
10	L2	469	1.8	469	1.8	0.505	15.0	LOS B	12.1	85.8	0.48	0.73	0.48	47.0
11	T1	129	3.3	129	3.3	0.563	49.9	LOS D	9.2	67.7	0.97	0.80	0.97	22.8
12	R2	38	16.7	38	16.7	0.563	55.6	LOS D	9.2	67.7	0.97	0.80	0.97	22.8
Approach		637	3.0	637	3.0	0.563	24.5	LOS B	12.1	85.8	0.61	0.74	0.61	40.4
All Vehicles		2661	3.3	2661	3.3	0.611	29.7	LOS C	20.5	145.0	0.74	0.72	0.74	36.6

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

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

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

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped	Dist]					
					ped	m			sec	m	m/sec
South: Appin Rd (S)											
P1	Full	3	54.2	LOS E	0.0	0.0	0.95	0.95	223.4	220.0	0.98
East: Kellerman Dr (E)											
P2	Full	2	54.2	LOS E	0.0	0.0	0.95	0.95	218.1	213.1	0.98
North: Appin Rd (N)											
P3	Full	41	54.2	LOS E	0.1	0.1	0.95	0.95	223.3	219.8	0.98

West: Fitzgibbon Ln (W)											
P4 Full	1	54.2	LOS E	0.0	0.0	0.95	0.95	219.7	215.2	0.98	
All Pedestrians	47	54.2	LOS E	0.1	0.1	0.95	0.95	223.0	219.4	0.98	

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

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

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

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MOVEMENT SUMMARY

Site: 102 [Kellerman Dr / Site Access EX PM (Site Folder: Existing Layout and Existing Traffic)]

Network: N101 [Existing PM (Network Folder: General)]

Kellerman Drive / Site Access
Existing Conditions
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Site Access (S)														
1	L2	16	6.7	16	6.7	0.031	0.4	LOS A	0.1	0.9	0.31	0.20	0.31	19.7
3	R2	15	0.0	15	0.0	0.031	3.3	LOS A	0.1	0.9	0.31	0.20	0.31	20.1
Approach		31	3.4	31	3.4	0.031	1.8	LOS A	0.1	0.9	0.31	0.20	0.31	19.9
East: Kellerman Dr (E)														
4	L2	18	0.0	18	0.0	0.083	5.6	LOS A	0.0	0.0	0.00	0.07	0.00	57.8
5	T1	141	1.5	141	1.5	0.083	0.0	LOS A	0.0	0.0	0.00	0.07	0.00	58.8
Approach		159	1.3	159	1.3	0.083	0.6	NA	0.0	0.0	0.00	0.07	0.00	58.6
West: Kellerman Dr (W)														
11	T1	297	2.1	297	2.1	0.155	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	9	0.0	9	0.0	0.006	4.1	LOS A	0.0	0.2	0.19	0.52	0.19	50.6
Approach		306	2.1	306	2.1	0.155	0.1	NA	0.0	0.2	0.01	0.02	0.01	59.6
All Vehicles		496	1.9	496	1.9	0.155	0.4	NA	0.1	0.9	0.02	0.04	0.02	51.1

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

MOVEMENT SUMMARY

Site: 103 [Appin Rd / Site Entry EX PM (Site Folder: Existing Layout and Existing Traffic)] Network: N101 [Existing PM (Network Folder: General)]

Appin Rd / Site Entry
Existing conditions
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	482	7.2	482	7.2	0.128	0.0	LOS A	4.4	32.4	0.00	0.00	0.00	59.9
Approach		482	7.2	482	7.2	0.128	0.0	NA	4.4	32.4	0.00	0.00	0.00	59.9
North: Appin Road (N)														
7	L2	44	2.4	44	2.4	0.210	3.5	LOS A	0.0	0.0	0.00	0.06	0.00	56.1
8	T1	753	4.1	753	4.1	0.210	0.0	LOS A	0.0	0.0	0.00	0.03	0.00	56.5
Approach		797	4.0	797	4.0	0.210	0.2	NA	0.0	0.0	0.00	0.03	0.00	56.4
All Vehicles		1279	5.2	1279	5.2	0.210	0.1	NA	4.4	32.4	0.00	0.02	0.00	57.3

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

Site: 104 [Appin Rd / Site Exit EX PM (Site Folder: Existing Layout and Existing Traffic)]

Network: N101 [Existing PM (Network Folder: General)]

Appin Rd / Site Exit
Existing conditions
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	482	7.2	482	7.2	0.259	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		482	7.2	482	7.2	0.259	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Site Exit (E)														
4	L2	43	0.0	43	0.0	0.029	7.5	LOS A	0.1	0.8	0.22	0.54	0.22	52.9
Approach		43	0.0	43	0.0	0.029	7.5	LOS A	0.1	0.8	0.22	0.54	0.22	52.9
North: Appin Road (N)														
8	T1	753	4.1	753	4.1	0.329	0.3	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		753	4.1	753	4.1	0.329	0.3	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		1278	5.1	1278	5.1	0.329	0.4	NA	0.1	0.8	0.01	0.02	0.01	59.3

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Appin Rd / Kellerman Dr / Fitzgibbon Ln EX PM - Future Layout (Site Folder: Future Layout and Existing Traffic)]

 Network: N101 [Future Layout Existing Traffic PM (Network Folder: General)]

Appin Road / Kellerman Drive / Fitzgibbon Lane

Existing volumes with future layout

PM peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total HV] veh/h	%				[Veh. veh	Dist] m				
South: Appin Rd (S)														
1	L2	17	0.0	17	0.0	0.089	23.4	LOS B	1.4	9.9	0.75	0.62	0.75	39.7
2	T1	476	6.9	476	6.9	* 0.447	38.2	LOS C	8.8	65.3	0.87	0.73	0.87	30.1
3	R2	9	0.0	9	0.0	0.102	65.4	LOS E	0.6	3.9	0.98	0.67	0.98	3.1
Approach		502	6.5	502	6.5	0.447	38.2	LOS C	8.8	65.3	0.87	0.73	0.87	29.8
East: Kellerman Dr (E)														
4	L2	5	0.0	5	0.0	0.282	52.4	LOS D	4.3	30.5	0.92	0.72	0.92	4.8
5	T1	77	1.4	77	1.4	0.282	49.4	LOS D	4.3	30.5	0.92	0.72	0.92	24.7
6	R2	75	2.8	75	2.8	0.528	63.0	LOS E	4.4	31.6	1.00	0.77	1.00	20.9
Approach		157	2.0	157	2.0	0.528	56.0	LOS D	4.4	31.6	0.96	0.75	0.96	22.3
North: Appin Rd (N)														
7	L2	167	1.3	167	1.3	0.249	15.6	LOS B	7.2	51.6	0.45	0.58	0.45	47.3
8	T1	754	3.4	754	3.4	0.249	9.2	LOS A	7.4	53.2	0.45	0.42	0.45	51.1
9	R2	444	1.4	444	1.4	* 0.456	31.4	LOS C	14.9	105.6	0.73	0.79	0.73	42.4
Approach		1365	2.5	1365	2.5	0.456	17.2	LOS B	14.9	105.6	0.54	0.56	0.54	46.2
West: Fitzgibbon Ln (W)														
10	L2	469	1.8	469	1.8	0.411	8.7	LOS A	6.8	48.4	0.39	0.68	0.39	51.9
11	T1	129	3.3	129	3.3	* 0.452	51.1	LOS D	7.1	50.8	0.96	0.77	0.96	22.9
12	R2	38	16.7	38	16.7	0.232	59.6	LOS E	2.1	16.8	0.94	0.74	0.94	20.7
Approach		637	3.0	637	3.0	0.452	20.3	LOS B	7.1	50.8	0.54	0.70	0.54	43.1
All Vehicles		2661	3.3	2661	3.3	0.528	24.2	LOS B	14.9	105.6	0.63	0.64	0.63	40.0

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

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

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

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m					
South: Appin Rd (S)											
P11	Stage 1	3	54.2	LOS E	0.0	0.0	0.95	0.95	218.9	214.2	0.98
P12	Stage 2	3	54.2	LOS E	0.0	0.0	0.95	0.95	216.4	210.9	0.97
East: Kellerman Dr (E)											
P2	Full	2	54.2	LOS E	0.0	0.0	0.95	0.95	218.1	213.1	0.98

North: Appin Rd (N)										
P31 Stage 1	41	54.2	LOS E	0.1	0.1	0.95	0.95	221.6	217.5	0.98
P32 Stage 2	41	54.2	LOS E	0.1	0.1	0.95	0.95	213.9	207.6	0.97
West: Fitzgibbon Ln (W)										
P4 Full	1	29.1	LOS C	0.0	0.0	0.90	0.90	194.6	215.2	1.11
All Pedestrians	92	53.9	LOS E	0.1	0.1	0.95	0.95	217.5	212.6	0.98

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

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

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

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MOVEMENT SUMMARY

▼ Site: 102 [Kellerman Dr / Site Access EX PM - Future Layout
(Site Folder: Future Layout and Existing Traffic)]

■ Network: N101 [Future
Layout Existing Traffic PM
(Network Folder: General)]

Kellerman Drive / Site Access
Existing volumes with future layout
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Site Access (S)														
1	L2	36	0.0	36	0.0	0.060	0.4	LOS A	0.2	1.5	0.25	0.14	0.25	19.7
3	R2	18	0.0	18	0.0	0.060	4.2	LOS A	0.2	1.5	0.25	0.14	0.25	19.8
Approach		54	0.0	54	0.0	0.060	1.7	LOS A	0.2	1.5	0.25	0.14	0.25	19.8
East: Kellerman Dr (E)														
4	L2	32	0.0	32	0.0	0.072	5.6	LOS A	0.0	0.0	0.00	0.14	0.00	57.2
5	T1	248	0.4	248	0.4	0.072	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	58.9
Approach		280	0.4	280	0.4	0.072	0.6	NA	0.0	0.0	0.00	0.07	0.00	58.6
West: Kellerman Dr (W)														
11	T1	234	3.2	234	3.2	0.123	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	15	0.0	15	0.0	0.013	4.8	LOS A	0.0	0.3	0.27	0.55	0.27	50.3
Approach		248	3.0	248	3.0	0.123	0.3	NA	0.0	0.3	0.02	0.03	0.02	59.3
All Vehicles		582	1.4	582	1.4	0.123	0.6	NA	0.2	1.5	0.03	0.06	0.03	48.4

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

▼ Site: 103 [Appin Rd / Site Entry EX PM - Future Layout (Site Folder: Future Layout and Existing Traffic)]

■ Network: N101 [Future Layout Existing Traffic PM (Network Folder: General)]

Appin Rd / Site Entry
Existing volumes with future layout
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	832	2.8	832	2.8	0.144	0.0	LOS A	2.1	14.8	0.00	0.00	0.00	59.9
Approach		832	2.8	832	2.8	0.144	0.0	NA	2.1	14.8	0.00	0.00	0.00	59.9
North: Appin Road (N)														
7	L2	38	5.6	38	5.6	0.067	3.5	LOS A	0.0	0.0	0.00	0.17	0.00	54.9
8	T1	337	7.2	337	7.2	0.067	0.0	LOS A	0.0	0.0	0.00	0.04	0.00	55.1
Approach		375	7.0	375	7.0	0.067	0.4	NA	0.0	0.0	0.00	0.06	0.00	54.9
All Vehicles		1206	4.1	1206	4.1	0.144	0.1	NA	2.1	14.8	0.00	0.02	0.00	57.5

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

▼ Site: 104 [Appin Rd / Site Exit EX PM - Future Layout (Site Folder: Future Layout and Existing Traffic)]

■ Network: N101 [Future Layout Existing Traffic PM (Network Folder: General)]

Appin Rd / Site Exit
Existing volumes with future layout
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	832	2.8	832	2.8	0.145	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		832	2.8	832	2.8	0.145	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Site Exit (E)														
4	L2	32	3.3	32	3.3	0.027	6.0	LOS A	0.1	0.7	0.21	0.55	0.21	52.8
Approach		32	3.3	32	3.3	0.027	6.0	LOS A	0.1	0.7	0.21	0.55	0.21	52.8
North: Appin Road (N)														
8	T1	337	7.2	337	7.2	0.060	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		337	7.2	337	7.2	0.060	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
All Vehicles		1200	4.0	1200	4.0	0.145	0.2	NA	0.1	0.7	0.01	0.01	0.01	59.5

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

■ ■ Network: N101 [Existing
Layout Future PM Volumes
(Network Folder: General)]

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

- * Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m					
South: Appin Rd (S)											
P1	Full	3	54.2	LOS E	0.0	0.0	0.95	0.95	223.4	220.0	0.98
East: Kellerman Dr (E)											
P2	Full	2	54.2	LOS E	0.0	0.0	0.95	0.95	218.1	213.1	0.98
North: Appin Rd (N)											

P3 Full	41	54.2	LOS E	0.1	0.1	0.95	0.95	223.3	219.8	0.98
West: Fitzgibbon Ln (W)										
P4 Full	1	54.2	LOS E	0.0	0.0	0.95	0.95	219.7	215.2	0.98
All Pedestrians	47	54.2	LOS E	0.1	0.1	0.95	0.95	223.0	219.4	0.98

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

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

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

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MOVEMENT SUMMARY

Site: 102 [Kellerman Dr / Site Access FUT PM (Site Folder: Existing Layout and Future PM Traffic)]

Network: N101 [Existing Layout Future PM Volumes (Network Folder: General)]

Kellerman Drive / Site Access
Existing conditions with future traffic generation
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h]	[HV %]	[Total veh/h]	[HV %]				[Veh. veh]	[Dist m]				
South: Site Access (S)														
1	L2	140	0.8	140	0.8	0.260	0.5	LOS A	0.6	4.3	0.28	0.18	0.28	19.8
3	R2	34	0.0	34	0.0	0.260	4.0	LOS A	0.6	4.3	0.28	0.18	0.28	20.1
Approach		174	0.6	174	0.6	0.260	1.2	LOS A	0.6	4.3	0.28	0.18	0.28	19.9
East: Kellerman Dr (E)														
4	L2	37	0.0	37	0.0	0.093	5.6	LOS A	0.0	0.3	0.00	0.12	0.00	57.3
5	T1	141	1.5	141	1.5	0.093	0.0	LOS A	0.0	0.3	0.00	0.12	0.00	57.8
Approach		178	1.2	178	1.2	0.093	1.2	NA	0.0	0.3	0.00	0.12	0.00	57.6
West: Kellerman Dr (W)														
11	T1	297	2.1	297	2.1	0.155	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	46	0.0	46	0.0	0.030	4.2	LOS A	0.1	0.8	0.20	0.54	0.20	50.6
Approach		343	1.8	343	1.8	0.155	0.6	NA	0.1	0.8	0.03	0.07	0.03	58.5
All Vehicles		695	1.4	695	1.4	0.260	0.9	NA	0.6	4.3	0.08	0.11	0.08	38.7

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

▼ Site: 103 [Appin Rd / Site Entry FUT PM (Site Folder: Existing Layout and Future PM Traffic)]

■ Network: N101 [Existing Layout Future PM Volumes (Network Folder: General)]

Appin Rd / Site Entry
Existing conditions with future traffic generation
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	482	7.2	482	7.2	0.124	0.0	LOS A	4.9	36.6	0.00	0.00	0.00	59.9
Approach		482	7.2	482	7.2	0.124	0.0	NA	4.9	36.6	0.00	0.00	0.00	59.9
North: Appin Road (N)														
7	L2	176	0.6	176	0.6	0.242	3.5	LOS A	0.0	0.0	0.00	0.22	0.00	54.8
8	T1	738	4.1	738	4.1	0.242	0.0	LOS A	0.0	0.0	0.00	0.08	0.00	51.3
Approach		914	3.5	914	3.5	0.242	0.7	NA	0.0	0.0	0.00	0.11	0.00	53.7
All Vehicles		1396	4.8	1396	4.8	0.242	0.4	NA	4.9	36.6	0.00	0.07	0.00	54.6

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

▼ Site: 104 [Appin Rd / Site Exit FUT PM (Site Folder: Existing Layout and Future PM Traffic)]

■ Network: N101 [Existing Layout Future PM Volumes (Network Folder: General)]

Appin Rd / Site Exit
Existing conditions with future traffic generation
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	482	7.2	482	7.2	0.259	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		482	7.2	482	7.2	0.259	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.9
East: Site Exit (E)														
4	L2	85	0.0	85	0.0	0.058	7.5	LOS A	0.2	1.6	0.22	0.55	0.22	52.9
Approach		85	0.0	85	0.0	0.058	7.5	LOS A	0.2	1.6	0.22	0.55	0.22	52.9
North: Appin Road (N)														
8	T1	753	4.1	753	4.1	0.329	0.3	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		753	4.1	753	4.1	0.329	0.3	NA	0.0	0.0	0.00	0.00	0.00	59.8
All Vehicles		1320	4.9	1320	4.9	0.329	0.7	NA	0.2	1.6	0.01	0.04	0.01	58.9

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

 Site: 101 [Appin Rd / Kellerman Dr / Fitzgibbon Ln FUT PM - Future Layout (Site Folder: Future Layout and Future PM Traffic)]

 Network: N101 [Future Layout Future PM Volumes (Network Folder: General)]

Appin Road / Kellerman Drive / Fitzgibbon Lane

Future volumes with future layout

PM peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Rd (S)														
1	L2	17	0.0	17	0.0	0.100	25.1	LOS B	1.4	10.2	0.79	0.64	0.79	38.4
2	T1	466	7.0	466	7.0	* 0.501	41.8	LOS C	8.8	65.3	0.91	0.76	0.91	28.5
3	R2	46	0.0	46	0.0	0.333	63.0	LOS E	2.7	18.9	0.99	0.74	0.99	3.2
Approach		529	6.2	529	6.2	0.501	43.1	LOS D	8.8	65.3	0.91	0.75	0.91	26.6
East: Kellerman Dr (E)														
4	L2	5	0.0	5	0.0	0.260	43.4	LOS D	5.6	39.5	0.85	0.69	0.85	5.8
5	T1	113	0.9	113	0.9	0.260	40.4	LOS C	5.6	39.5	0.85	0.69	0.85	27.7
6	R2	162	1.3	162	1.3	* 0.642	54.6	LOS D	9.1	64.6	0.98	0.83	1.00	22.8
Approach		280	1.1	280	1.1	0.642	48.7	LOS D	9.1	64.6	0.92	0.77	0.94	24.4
North: Appin Rd (N)														
7	L2	164	1.3	164	1.3	0.323	22.5	LOS B	10.5	74.7	0.59	0.64	0.59	40.5
8	T1	833	3.0	833	3.0	0.323	16.2	LOS B	10.7	76.7	0.59	0.54	0.59	43.0
9	R2	436	1.4	436	1.4	* 0.506	36.0	LOS C	15.9	112.6	0.79	0.80	0.79	40.3
Approach		1433	2.4	1433	2.4	0.506	22.9	LOS B	15.9	112.6	0.65	0.63	0.65	41.5
West: Fitzgibbon Ln (W)														
10	L2	462	1.8	462	1.8	0.461	11.3	LOS A	7.3	51.8	0.54	0.73	0.54	50.0
11	T1	127	3.3	127	3.3	0.286	40.8	LOS C	6.1	44.2	0.87	0.70	0.87	26.2
12	R2	75	8.5	75	8.5	0.298	52.4	LOS D	3.9	29.1	0.91	0.77	0.91	22.5
Approach		664	2.9	664	2.9	0.461	21.6	LOS B	7.3	51.8	0.64	0.73	0.64	42.1
All Vehicles		2906	3.0	2906	3.0	0.642	28.8	LOS C	15.9	112.6	0.73	0.69	0.73	36.8

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

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

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

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

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

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

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m					
South: Appin Rd (S)											
P11	Stage 1	3	54.2	LOS E	0.0	0.0	0.95	0.95	218.9	214.2	0.98
P12	Stage 2	3	54.2	LOS E	0.0	0.0	0.95	0.95	216.4	210.9	0.97
East: Kellerman Dr (E)											
P2	Full	2	54.2	LOS E	0.0	0.0	0.95	0.95	218.1	213.1	0.98

North: Appin Rd (N)										
P31 Stage 1	41	54.2	LOS E	0.1	0.1	0.95	0.95	221.6	217.5	0.98
P32 Stage 2	41	54.2	LOS E	0.1	0.1	0.95	0.95	213.9	207.6	0.97
West: Fitzgibbon Ln (W)										
P4 Full	1	25.3	LOS C	0.0	0.0	0.90	0.90	190.8	215.2	1.13
All Pedestrians	92	53.9	LOS E	0.1	0.1	0.95	0.95	217.4	212.6	0.98

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

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

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

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MOVEMENT SUMMARY

▼ Site: 102 [Kellerman Dr / Site Access FUT PM - Future Layout
(Site Folder: Future Layout and Future PM Traffic)]

■ Network: N101 [Future
Layout Future PM Volumes
(Network Folder: General)]

Kellerman Drive / Site Access
Future volumes with future layout
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Site Access (S)														
1	L2	140	0.8	140	0.8	0.168	0.3	LOS A	0.7	4.8	0.18	0.10	0.18	19.8
3	R2	34	0.0	34	0.0	0.168	4.7	LOS A	0.7	4.8	0.18	0.10	0.18	19.9
Approach		174	0.6	174	0.6	0.168	1.2	LOS A	0.7	4.8	0.18	0.10	0.18	19.8
East: Kellerman Dr (E)														
4	L2	37	0.0	37	0.0	0.057	5.6	LOS A	0.0	0.0	0.00	0.20	0.00	56.6
5	T1	141	1.5	141	1.5	0.057	0.0	LOS A	0.0	0.0	0.00	0.10	0.00	58.1
Approach		178	1.2	178	1.2	0.057	1.2	NA	0.0	0.0	0.00	0.12	0.00	57.6
West: Kellerman Dr (W)														
11	T1	297	2.1	297	2.1	0.156	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	46	0.0	46	0.0	0.038	4.4	LOS A	0.1	0.9	0.21	0.54	0.21	50.8
Approach		343	1.8	343	1.8	0.156	0.6	NA	0.1	0.9	0.03	0.07	0.03	58.5
All Vehicles		695	1.4	695	1.4	0.168	0.9	NA	0.7	4.8	0.06	0.09	0.06	38.6

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

▼ Site: 103 [Appin Rd / Site Entry FUT PM - Future Layout (Site Folder: Future Layout and Future PM Traffic)]

■ Network: N101 [Future Layout Future PM Volumes (Network Folder: General)]

Appin Rd / Site Entry
Future volumes with future layout
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	482	7.2	482	7.2	0.084	0.0	LOS A	2.4	17.6	0.00	0.00	0.00	60.0
Approach		482	7.2	482	7.2	0.084	0.0	NA	2.4	17.6	0.00	0.00	0.00	60.0
North: Appin Road (N)														
7	L2	176	0.6	176	0.6	0.161	3.5	LOS A	0.0	0.0	0.00	0.33	0.00	53.8
8	T1	738	4.1	738	4.1	0.161	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	53.8
Approach		914	3.5	914	3.5	0.161	0.7	NA	0.0	0.0	0.00	0.11	0.00	53.8
All Vehicles		1396	4.8	1396	4.8	0.161	0.4	NA	2.4	17.6	0.00	0.07	0.00	54.7

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

▼ Site: 104 [Appin Rd / Site Exit FUT PM - Future Layout (Site Folder: Future Layout and Future PM Traffic)]

■ Network: N101 [Future Layout Future PM Volumes (Network Folder: General)]

Appin Rd / Site Exit
Future volumes with future layout
PM peak period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	482	7.2	482	7.2	0.086	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	60.0
Approach		482	7.2	482	7.2	0.086	0.0	NA	0.0	0.0	0.00	0.00	0.00	60.0
East: Site Exit (E)														
4	L2	85	0.0	85	0.0	0.082	6.6	LOS A	0.3	2.1	0.34	0.61	0.34	52.6
Approach		85	0.0	85	0.0	0.082	6.6	LOS A	0.3	2.1	0.34	0.61	0.34	52.6
North: Appin Road (N)														
8	T1	753	4.1	753	4.1	0.132	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
Approach		753	4.1	753	4.1	0.132	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.9
All Vehicles		1320	4.9	1320	4.9	0.132	0.4	NA	0.3	2.1	0.02	0.04	0.02	59.0

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

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MOVEMENT SUMMARY

 **Site: 101 [Appin Rd / Kellerman Dr / Fitzgibbon Ln 2031 FUT PM - Future Layout (Site Folder: Future Layout and 2031 FUT PM Traffic)]**

 **Network: N101 [2031 Future Layout Future PM Volumes (Network Folder: General)]**

Appin Road / Kellerman Drive / Fitzgibbon Lane

2031 Future volumes with future layout

PM peak period

Site Category: (None)

Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 120 seconds (Site User-Given Cycle Time)

Design Life Analysis (Final Year): Results for 11 years

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Appin Rd (S)														
1	L2	19	0.0	19	0.0	0.132	26.4	LOS B	1.6	11.3	0.83	0.67	0.83	37.5
2	T1	528	7.0	528	7.0	* 0.660	46.6	LOS D ¹¹	8.8	65.3	0.97	0.81	0.97	26.7
3	R2	52	0.0	52	0.0	0.423	64.8	LOS E ¹¹	3.1	21.8	1.00	0.75	1.00	3.1
Approach		599	6.2	599	6.2	0.660	47.5	LOS D ¹¹	8.8	65.3	0.97	0.80	0.97	25.1
East: Kellerman Dr (E)														
4	L2	10	0.0	10	0.0	0.317	33.5	LOS C	9.0	63.8	0.77	0.65	0.77	7.5
5	T1	206	0.9	206	0.9	0.317	30.6	LOS C	9.0	63.8	0.77	0.65	0.77	32.0
6	R2	296	1.3	296	1.3	* 0.761	48.6	LOS D ¹¹	10.4	73.4	0.97	0.89	1.05	24.4
Approach		511	1.1	511	1.1	0.761	41.1	LOS C	10.4	73.4	0.88	0.79	0.93	26.9
North: Appin Rd (N)														
7	L2	166	1.3	166	1.3	0.408	31.3	LOS C	13.2	94.3	0.74	0.72	0.74	34.0
8	T1	842	3.0	842	3.0	0.408	24.9	LOS B	13.5	96.7	0.74	0.65	0.74	35.8
9	R2	441	1.4	441	1.4	* 0.654	44.9	LOS D ¹¹	18.4	130.7	0.90	0.83	0.90	36.7
Approach		1448	2.4	1448	2.4	0.654	31.7	LOS C	18.4	130.7	0.79	0.71	0.79	36.0
West: Fitzgibbon Ln (W)														
10	L2	533	1.8	533	1.8	0.689	16.1	LOS B	13.1	93.1	0.70	0.80	0.70	47.0
11	T1	147	3.3	147	3.3	0.220	29.3	LOS C	6.0	43.2	0.74	0.61	0.74	31.1
12	R2	86	8.5	86	8.5	0.267	42.9	LOS D ¹¹	4.0	30.1	0.82	0.76	0.82	25.3
Approach		766	2.9	766	2.9	0.689	21.6	LOS B	13.1	93.1	0.72	0.76	0.72	42.1
All Vehicles		3325	3.0	3325	3.0	0.761	33.7	LOS C	18.4	130.7	0.82	0.75	0.83	34.0

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

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

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

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

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

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

¹¹ Level of Service is worse than the Level of Service Target specified in the Parameter Settings dialog.

* Critical Movement (Signal Timing)

Pedestrian Movement Performance											
Mov ID	Crossing	Dem. Flow	Aver. Delay	Level of Service	AVERAGE BACK OF QUEUE		Prop. Que	Effective Stop Rate	Travel Time	Travel Dist.	Aver. Speed
		ped/h	sec		[Ped ped	Dist] m			sec	m	m/sec
South: Appin Rd (S)											
P11	Stage 1	4	54.2	LOS E ¹²	0.0	0.0	0.95	0.95	218.9	214.2	0.98
P12	Stage 2	4	54.2	LOS E ¹²	0.0	0.0	0.95	0.95	216.4	210.9	0.97

East: Kellerman Dr (E)											
P2 Full	3	54.2	LOS E ¹²	0.0	0.0	0.95	0.95	218.1	213.1	0.98	
North: Appin Rd (N)											
P31 Stage 1	50	54.3	LOS E ¹²	0.2	0.2	0.95	0.95	221.6	217.5	0.98	
P32 Stage 2	50	54.3	LOS E ¹²	0.2	0.2	0.95	0.95	214.0	207.6	0.97	
West: Fitzgibbon Ln (W)											
P4 Full	1	24.3	LOS C	0.0	0.0	0.90	0.90	189.9	215.2	1.13	
All Pedestrians	112	53.9	LOS E ¹²	0.2	0.2	0.95	0.95	217.4	212.6	0.98	

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

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

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

¹² Level of Service is worse than the Pedestrian Level of Service Target specified in the Parameter Settings dialog.

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MOVEMENT SUMMARY

Site: 102 [Kellerman Dr / Site Access 2031 FUT PM - Future Layout (Site Folder: Future Layout and 2031 FUT PM Traffic)]

Network: N101 [2031 Future Layout Future PM Volumes (Network Folder: General)]

Kellerman Drive / Site Access
2031 Future volumes with future layout
PM peak period
Site Category: (None)
Give-Way (Two-Way)
Design Life Analysis (Final Year): Results for 11 years

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV] %	[Total veh/h	HV] %				[Veh. veh	Dist] m				
South: Site Access (S)														
1	L2	140	0.8	140	0.8	0.279	0.4	LOS A	0.8	5.3	0.21	0.12	0.21	19.6
3	R2	34	0.0	34	0.0	0.279	8.3	LOS A	0.8	5.3	0.21	0.12	0.21	19.8
Approach		174	0.6	174	0.6	0.279	1.9	LOS A	0.8	5.3	0.21	0.12	0.21	19.7
East: Kellerman Dr (E)														
4	L2	37	0.0	37	0.0	0.090	5.6	LOS A	0.0	0.0	0.00	0.18	0.00	56.8
5	T1	257	1.5	257	1.5	0.090	0.0	LOS A	6.4	45.4	0.00	0.06	0.00	58.9
Approach		294	1.3	294	1.3	0.090	0.7	NA	6.4	45.4	0.00	0.07	0.00	58.4
West: Kellerman Dr (W)														
11	T1	401	2.1	401	2.1	0.210	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.9
12	R2	46	0.0	46	0.0	0.043	4.9	LOS A	0.1	1.0	0.29	0.57	0.29	50.1
Approach		448	1.9	448	1.9	0.210	0.5	NA	0.1	1.0	0.03	0.06	0.03	58.7
All Vehicles		916	1.5	916	1.5	0.279	0.8	NA	6.4	45.4	0.05	0.08	0.05	41.9

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

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

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

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

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

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

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

MOVEMENT SUMMARY

▼ **Site: 103 [Appin Rd / Site Entry 2031 FUT PM - Future Layout**
 ■ **Network: N101 [2031 Future Layout Future PM Volumes**
(Site Folder: Future Layout and 2031 FUT PM Traffic)]
 (Network Folder: General)]

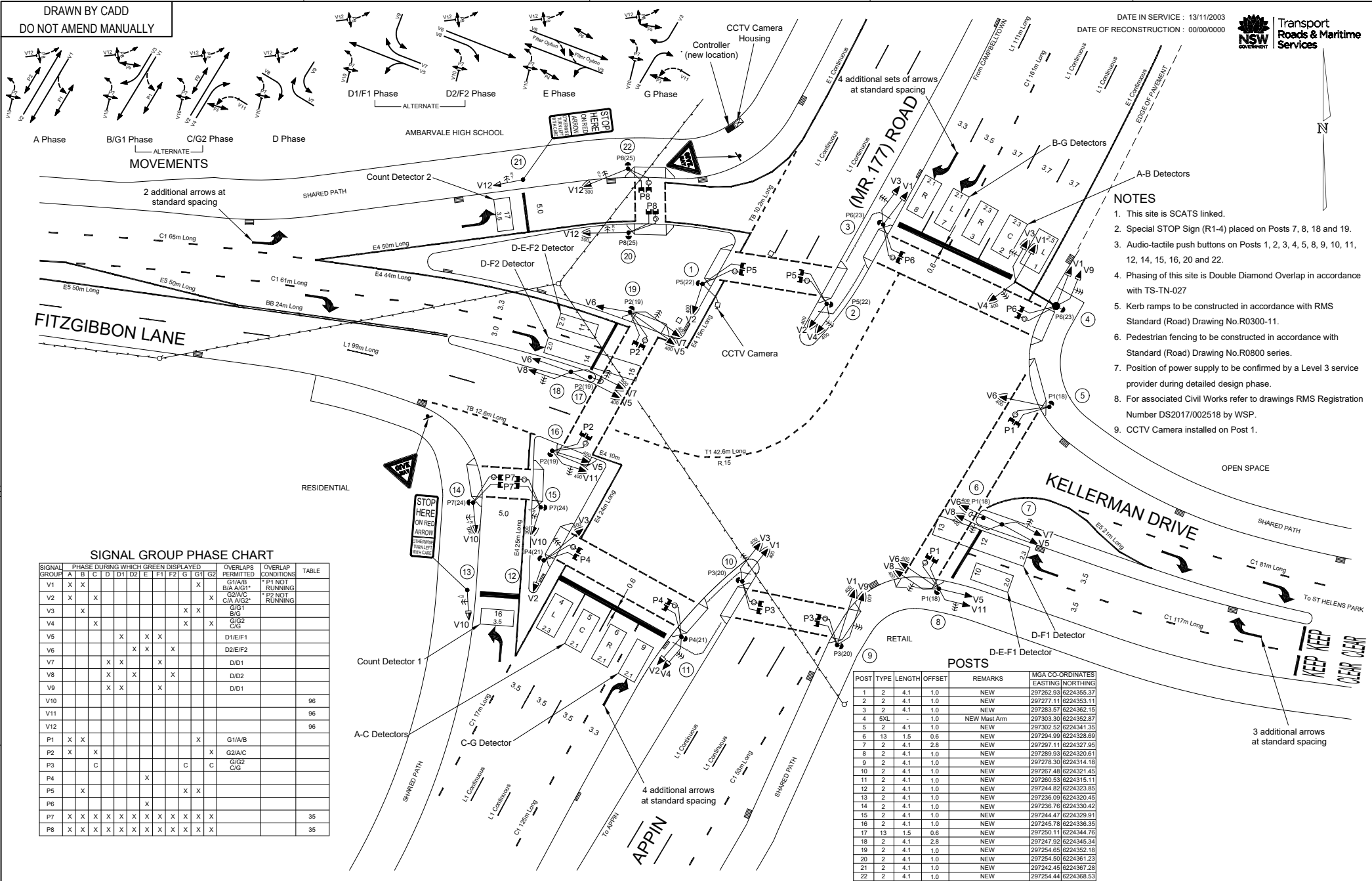
Appin Rd / Site Entry
 2031 Future volumes with future layout
 PM peak period
 Site Category: (None)
 Give-Way (Two-Way)
 Design Life Analysis (Final Year): Results for 11 years

Vehicle Movement Performance														
Mov ID	Turn	DEMAND FLOWS		ARRIVAL FLOWS		Deg. Satn	Aver. Delay	Level of Service	95% BACK OF QUEUE		Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed
		[Total veh/h	HV %	[Total veh/h	HV %				[Veh. veh	Dist] m				
South: Appin Road (S)														
2	T1	546	7.2	546	7.2	0.095	0.0	LOS A	4.7	34.9	0.00	0.00	0.00	60.0
Approach		546	7.2	546	7.2	0.095	0.0	NA	4.7	34.9	0.00	0.00	0.00	60.0
North: Appin Road (N)														
7	L2	176	0.6	176	0.6	0.178	3.5	LOS A	0.0	0.0	0.00	0.30	0.00	54.1
8	T1	835	4.1	835	4.1	0.178	0.0	LOS A	0.0	0.0	0.00	0.06	0.00	53.8
Approach		1011	3.5	1011	3.5	0.178	0.6	NA	0.0	0.0	0.00	0.10	0.00	54.0
All Vehicles		1557	4.8	1557	4.8	0.178	0.4	NA	4.7	34.9	0.00	0.06	0.00	54.9

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



**ANNEXURE D: TFNSW INTERSECTION UPGRADE
PLANS
(2 SHEETS)**

DRAWN BY CADD
DO NOT AMEND MANUALLY

80% DRAFT DETAILED DESIGN STAGE

PUBLIC UTILITY LEGEND		REFERENCE PLANS		U.S.D. Ref. Map 366 F4	
HYDRANT	□	SYMBOLS/ABRVS	V0003-6	U.S.D. E	281 674
STOP VALVE	▲	SYMBOLS/ABRVS	V0001-5	COORDS	1 235 031
GAS VALVE	■	SYMBOLS/ABRVS	V0005-17		
SEWER MANHOLE	○	SYMBOLS/ABRVS	V0006-19		
COMMS PIT	□	SYMBOLS/ABRVS	V0007-20		
ELECT LIGHT POLE	□	SYMBOLS/ABRVS	V0008-21		
POWER POLE	□	SYMBOLS/ABRVS	V0009-22		
TELEPHONE BOX	□	SYMBOLS/ABRVS	V0010-23		
COMMS PILLAR	□	SYMBOLS/ABRVS	V0011-24		

DESIGN APPROVAL		RMS RECOMMENDATION		RMS ACCEPTANCE	
APPROVED		ROAD DESIGN ENGINEERING		ACCEPTED	
DESIGNED: LISA TULAU		NAME: _____		NAME: _____	
CHECKED: TERRY LAURENCE		POSITION: _____		POSITION: _____	
LISA TULAU		DATE: _____		DATE: _____	
TERRY LAURENCE		NETWORK OPERATIONS		ACCEPTED BY: _____	
DESIGN PREPARED BY: TERRY LAURENCE		NAME: _____		SECTION: _____	
RECOMMENDED		DATE: _____			

ROADS AND MARITIME SERVICES	
CAMPBELLTOWN COUNCIL AREA	
TRAFFIC SIGNALS AT	
APPIN ROAD (MR177), KELLERMAN DRIVE AND	
FITZGIBBON LANE, ROSEMEADOW	

EXISTING		PROPOSED	
CADD FILE:	VV3813_8A.dgn	SCALE:	1:200
FILE:	SF2014/013371	SUPERSIDES:	5/A
REG No:	DS2014/004200	TCS No:	3813
Revision:	6 - July 2017	SHEET:	8

EXISTING		PROPOSED	
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REG No:	DS2014/004200	TCS No:	3813
Revision:	6 - July 2017	SHEET:	8

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CADD FILE:	VV3813_8A.dgn	SCALE:	1:200
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REG No:	DS2014/004200	TCS No:	3813
Revision:	6 - July 2017	SHEET:	8

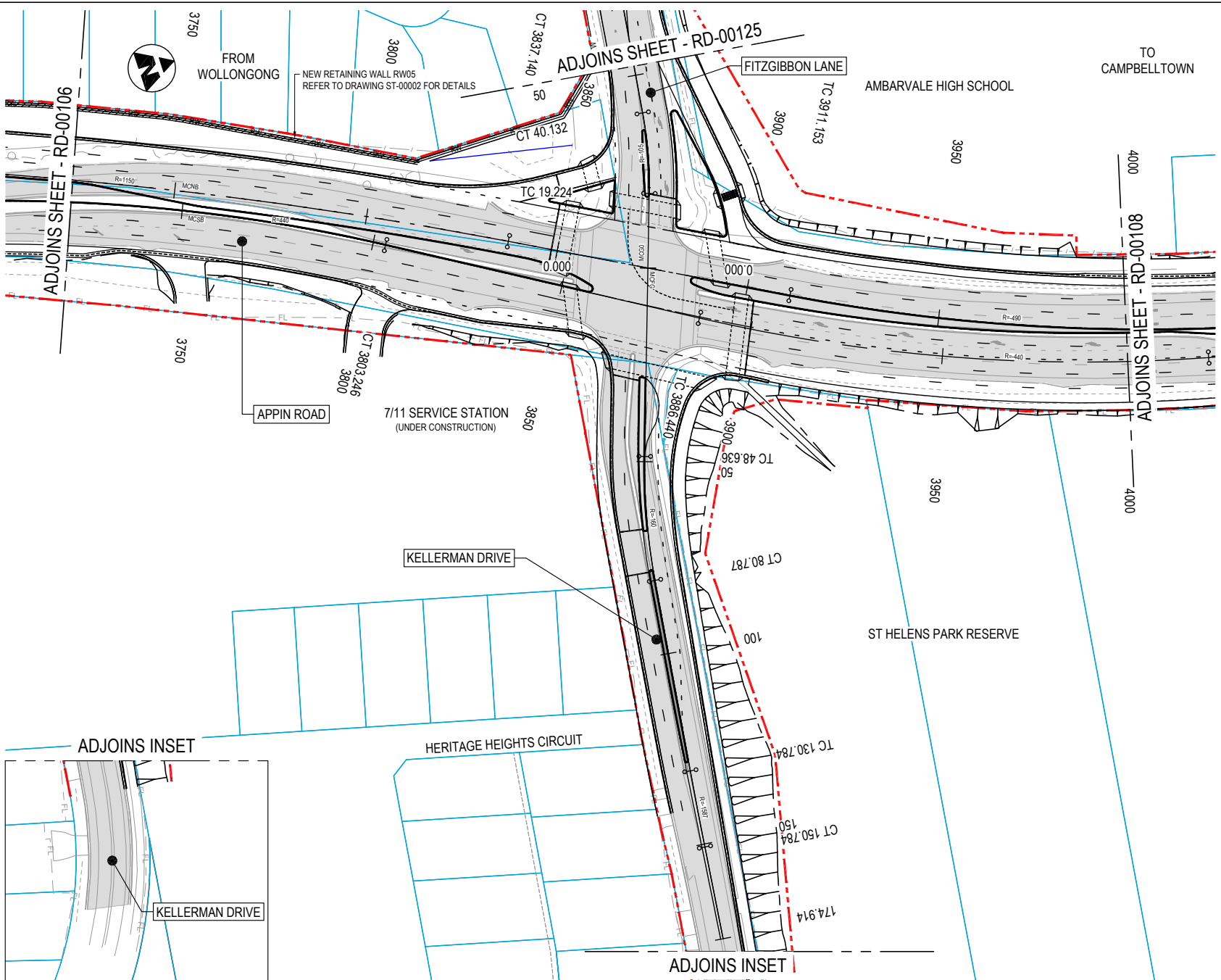
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FILE:	SF2014/013371	SUPERSIDES:	5/A
REG No:	DS2014/004200	TCS No:	3813
Revision:	6 - July 2017	SHEET:	8

EXISTING		PROPOSED	
CADD FILE:	VV3813_8A.dgn	SCALE:	1:200
FILE:	SF2014/013371	SUPERSIDES:	5/A
REG No:	DS2014/004200	TCS No:	3813
Revision:	6 - July 2017	SHEET:	8

EXISTING		PROPOSED	
CADD FILE:	VV3813_8A.dgn	SCALE:	1:200
FILE:	SF2014/013371	SUPERSIDES:	5/A
REG No:	DS2014/004200	TCS No:	3813
Revision:	6 - July 2017	SHEET:	8

THIS DRAWING MAY BE PREPARED IN COLOUR AND MAY BE INCOMPLETE IF COPIED

C:\projects\ps107784\ps107784-02-DRG-00107.dwg
150mm ON A3 SIZE ORIGINAL

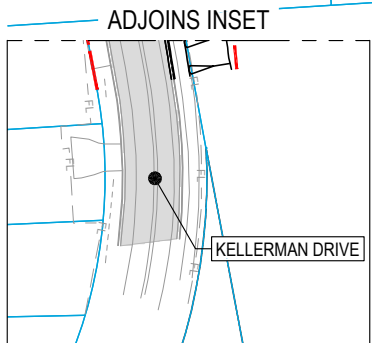


THE UTILITIES/SERVICES SHOWN IN THESE PLANS HAVE BEEN COMPILED FROM MULTIPLE SOURCES OF INFORMATION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO UNDERTAKE THEIR OWN SITE INVESTIGATIONS PRIOR TO ANY CONSTRUCTION ACTIVITIES. THESE DRAWINGS ARE NEVER TO BE USED FOR THE PURPOSE OF LOCATING SERVICES. WSP SHALL NOT BE LIABLE FOR ANY LOSS OR DAMAGE CAUSED USING THE UTILITIES/SERVICES INFORMATION SHOWN ON THESE DRAWINGS.

- NOTES
1. ALL DIMENSIONS IN METRES UNLESS SPECIFIED OTHERWISE.
 2. FOR GENERAL NOTES AND LEGEND REFER TO DRAWING RD-00010.
 3. FOR CLEARING LIMIT REFER TO ENVIRONMENTAL DESIGN LOT EV-01. RF-02 NOT SUBMITTED FOR DRAFT 80% DETAILED DESIGN.
 4. GENERAL ARRANGEMENT PLAN DRAWINGS TO BE READ IN CONJUNCTION WITH SUPPORTING TYPICAL SECTIONS AND DESIGN REPORT.

GENERAL LEGEND

- NEW ROAD RESERVE BOUNDARY
- EXISTING CADASTRAL BOUNDARY
- EASEMENT BOUNDARY
- DESIGN (WSP)
- DESIGN KERB AND SO GUTTER
- DESIGN (WSP) SOUTHERN SECTION
- WIRE ROPE SAFETY BARRIER
- EZYGUARD HC BARRIER
- PEDESTRIAN FENCE
- TYPE F BARRIER
- NOISE MITIGATION TREATMENT
- RETAINING WALL
- EXISTING PAVEMENT



NOT FOR CONSTRUCTION

DOCUMENT NUMBER / NAME PS107784-02-RD-DRG-00107					DESIGN LOT CODE		DESIGN MODEL FILE(S) USED FOR DOCUMENTATION OF THIS DRAWING					PLOT DATE / TIME 1 November 2019 - 3:38:31 PM Frew, John			PLOT BY		CLIENT		CAMPBELLTOWN CITY COUNCIL MR177 APPIN ROAD WIDENING TO FOUR LANES FROM NOORUMBA RESERVE TO WOODLAND RESERVE ROAD ALIGNMENT AND DETAIL GENERAL ARRANGEMENT PLAN					A3																																																						
EXTERNAL REFERENCE FILES					REV	DATE	AMENDMENT / REVISION DESCRIPTION			WVR No.	APPROVAL	SCALES ON A3 SIZE DRAWING			DRAWINGS / DESIGN PREPARED BY					TITLE			NAME	DATE	PREPARED FOR		RMS REGISTRATION No.			DS2019/000549		PART																																														
					01	01.11.19	ISSUE FOR DRAFT 80% DETAIL DESIGN				N.M.	01020304050 SCALE 1:1000m			wsp Level 27, 680 George Street, Sydney GPO Box 5394, NSW 2001, Australia Tel: +61 2 9072 5100 Fax: +61 2 9072 5101 wsp.com					DRAWN			JOHN FREW		01.11.19		DRG CHECK			MATTHEW JEDNIUK		01.11.19		DESIGN			DARREN BETTS		01.11.19		DESIGN CHECK			DANIEL PARK		01.11.19		DESIGN MNGR			CHRISTINE TSAO		01.11.19		PROJECT MNGR			NUNO MURALHA		01.11.19		ISSUE STATUS			DRAFT 80% DETAIL DESIGN		EDMS No.		RD-00107		SHEET No.		RD-00107		ISSUE		01	

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wsp.com





**ANNEXURE E: SIGHT LINE ASSESSMENT
(2 SHEETS)**



— Sight Line

— Sight Distance

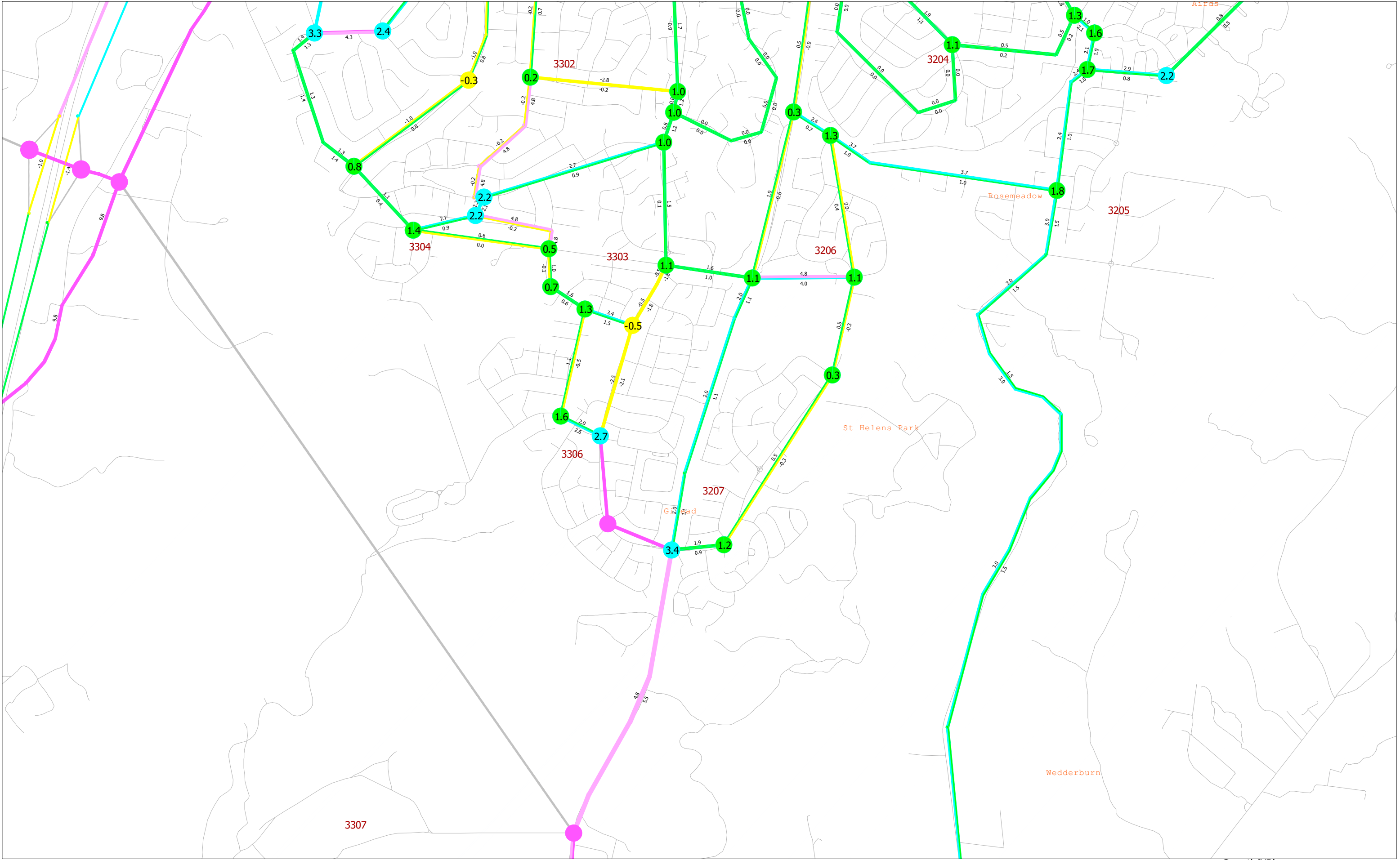


— Sight Line
— Sight Distance



**ANNEXURE F: TFNSW STRATEGIC TRAFFIC
FORECASTING MODEL
(2 SHEETS)**

ROAD TRAFFIC GROWTH (%YR, 2HRSPK) LINKS & INTERSECTIONS



ROAD TRAFFIC GROWTH (%YR, 2HRSPK) LINKS & INTERSECTIONS

