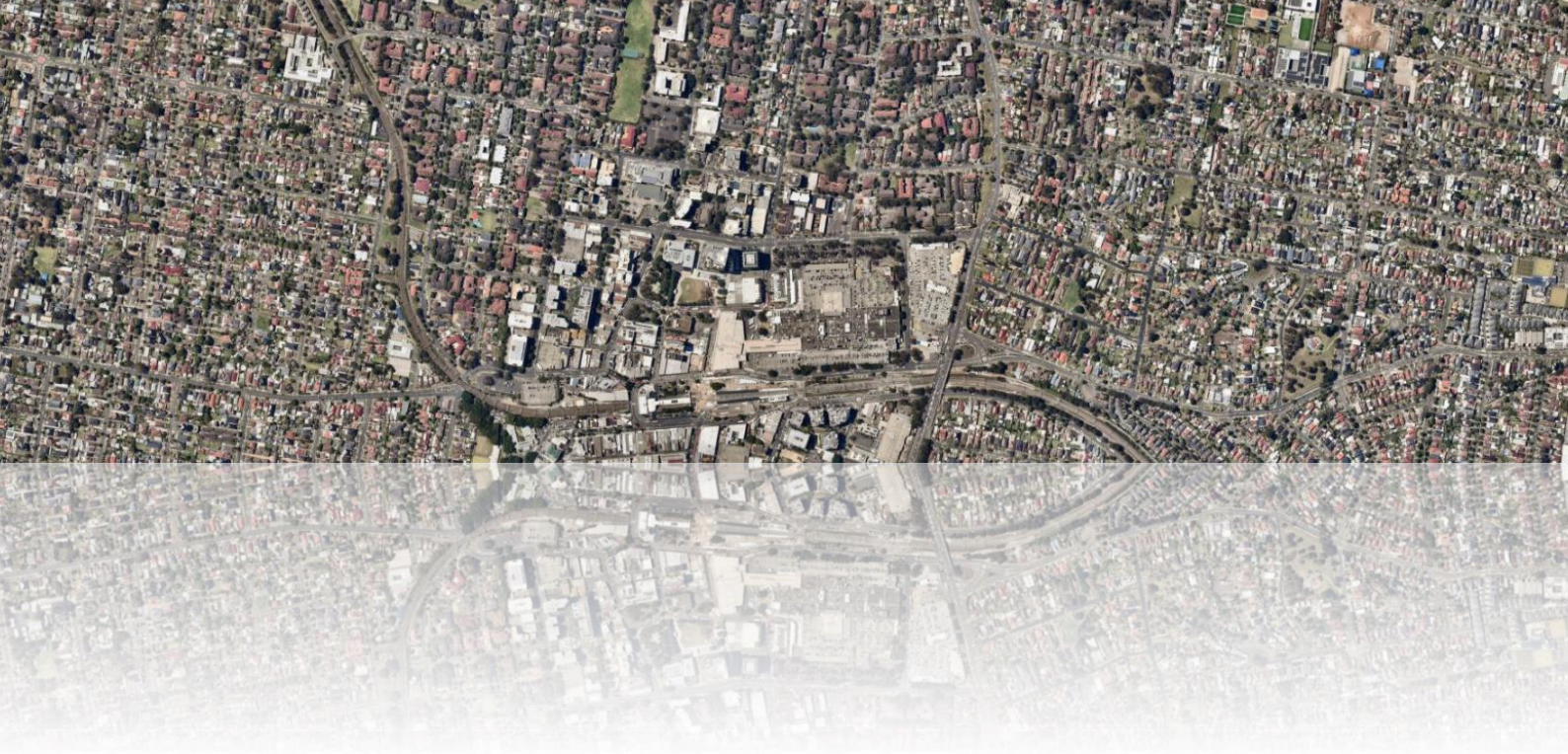




**TRAFFIC AND PARKING IMPACT ASSESSMENT OF
THE PROPOSED MIXED USE DEVELOPMENT
AT 461 CHAPEL ROAD, BANKSTOWN**



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

Development Type: **Mixed Use Development**

Site Address: **461 Chapel Road, Bankstown**

Prepared for: **Sustainable Development Group Pty Ltd**

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SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

The Secretary's Environmental Assessment Requirements relevant to traffic and transport are as follows and are addressed within the sections of this report described in **Table 1**.

TABLE 1: SEARS ITEMS

SEARs Requirements
9. Transport Provide a Transport Impact Assessment (TIA) in accordance with processes and methodology recommended in the Guide to Transport Impact Assessment (GTIA) published by TfNSW.
If the construction of the development would cause interruptions to regular pedestrian and transport routes (including public transport, active transport or general traffic), a preliminary Construction Traffic (or Transport) Management Plan (CTMP) should be prepared as part of the TIA to mitigate such impacts.

Reference is made to TfNSW's *GTIA* which outlines the transport impact assessment process as shown in **Table 2**.

TABLE 2: TFNSW GTIA – TRANSPORT IMPACT ASSESSMENT PROCESS

Phase	
Scoping and background conditions	Step 1 – Document proposed development location, scale and access arrangements for all modes
	Step 2 – Identify the area of influence and surrounding transport networks
	Step 3 – Understand the existing and future baseline transport network conditions (for all modes in the area of influence)
Proposed development analysis	Step 4 – Identify and select travel demand management measures
	Step 5 – Estimate trip generation to/from the development
Impact assessment and mitigation	Step 6 – Assess the development impacts on the transport network (across all modes in the area of influence)
	Step 7 – Determine parking provision (including bicycle parking)
	Step 8 – Review and refine development design and site access points (incorporating findings of assessment, parking requirements and TDM)
	Step 9 – Impact mitigation (refined design, updated TDM measures, upgrade infrastructure)
Documentation	Step 10 – Document findings and recommendations

This traffic and parking impact assessment report has been prepared with due consideration to the SEARs and GTIA requirements outlined above.

1 INTRODUCTION

McLaren Traffic Engineering was commissioned by *Sustainable Development Group Pty Ltd* to provide a traffic and parking impact assessment of the proposed mixed use development at 461 Chapel Road, Bankstown as depicted in **Annexure A**.

1.1 Description and Scale of Development

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

- Place of public worship with an advised maximum capacity of 350 seats, currently operating with the following sessions:
 - 8am service;
 - 10am service;
 - 2pm service.
- One (1) driveway via French Avenue and two (2) driveways via Chapel Road facilitating access to existing hardstand areas.

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

- An affordable rental housing development consisting of the following:
 - 41 studio units;
 - 144 one-bedroom units;
 - One (1) four-bedroom unit.
- A retail premises with 172m² GFA;
- A commercial premises with 354m² GFA;
- An increase in the yield of the existing place of worship to accommodate a maximum of 509 seats over two (2) halls on the ground level and first floor (previously 350 seats);
- A child care centre accommodating **50** children and **9** staff, consisting of the following age split:
 - 10 children between 0-2 years old (3 educator staff, applied at a rate of 1 staff per 4 children);
 - 20 children between 2-3 years old (4 educator staff, applied at a rate of 1 staff per 5 children);
 - 20 children 3+ years old (2 educator staff, applied at a rate of 1 staff per 10 children).
- Vehicular access is proposed via a two-way driveway from French Avenue facilitating access to an at-grade and basement level car park accommodating a total of **50** car parking spaces, including:
 - 13 x child care centre car parking spaces (7 visitor, 6 staff);

- 30 x residential car parking spaces (including one (1) rectory (priest or minister) parking space);
- Four (4) commercial staff car parking spaces;
- Three (3) retail staff car parking spaces.

1.2 State Environmental Planning Policy (Transport and Infrastructure) 2021

The proposed development does not qualify as a traffic generating development with relevant size and/or capacity under *Clause 2.122* of the *SEPP (Transport and Infrastructure) 2021*. Accordingly, formal referral to Transport for NSW (TfNSW) is unnecessary, and the application can be assessed by Canterbury Bankstown Council officers.

1.3 Site Description

The subject site includes the three (3) lots legally identified as Lot 26/A/DP7058, Lot 27/A/DP7058 and Lot 28/A/7058 which are currently zoned *B4 – Mixed Use* under the *Canterbury Bankstown Local Environmental Plan 2023* (CBLEP 2023) and is currently occupied by a place of public worship. The site has frontages to French Avenue to the north and Chapel Road to the west.

The subject site is located within the Bankstown City Centre and is generally surrounded by retail and commercial developments in all directions with Bankstown Central Shopping Centre located southeast of the site, Aldi located east of the site and TAFE NSW Bankstown is located northwest of the site. Bankstown Train Station is located approximately 500m walking distance south of the subject 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.

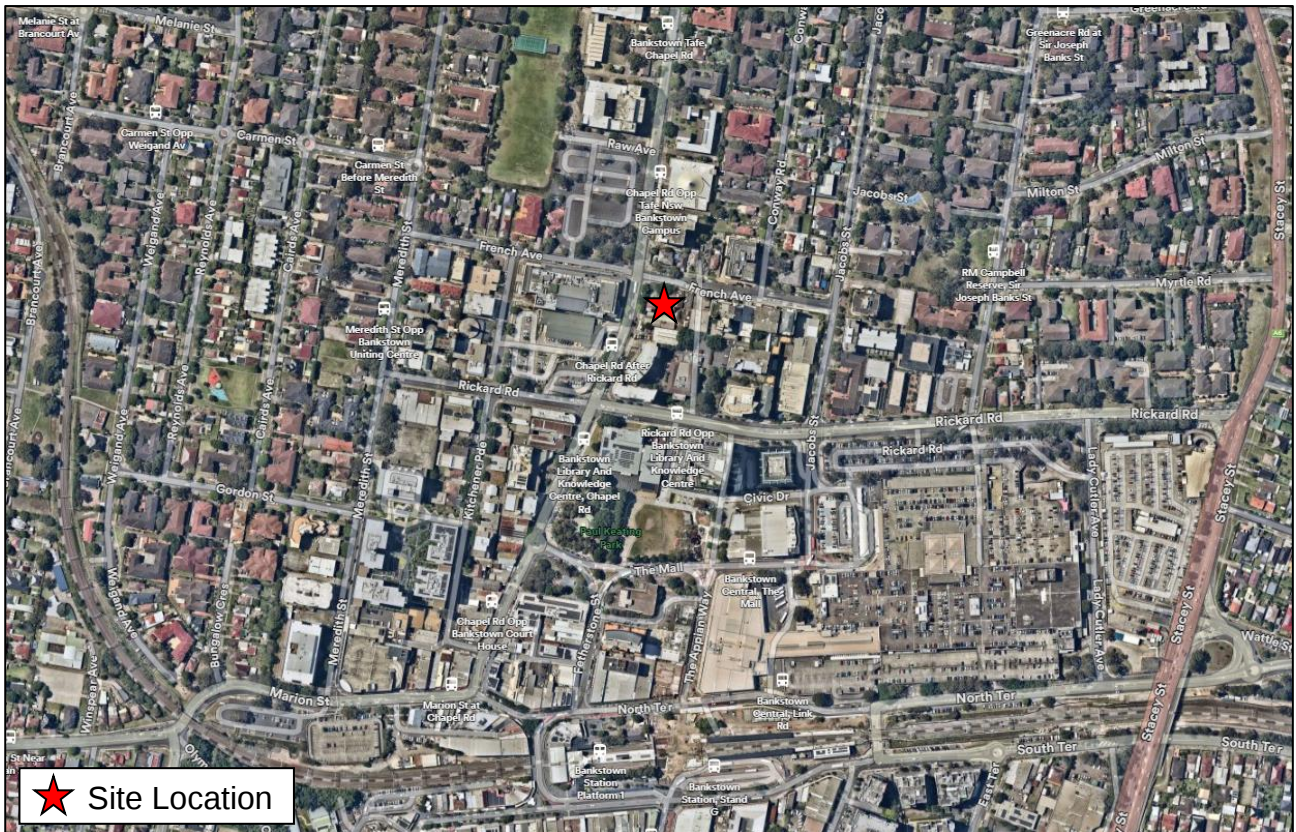


FIGURE 1: SITE CONTEXT – AERIAL PHOTO

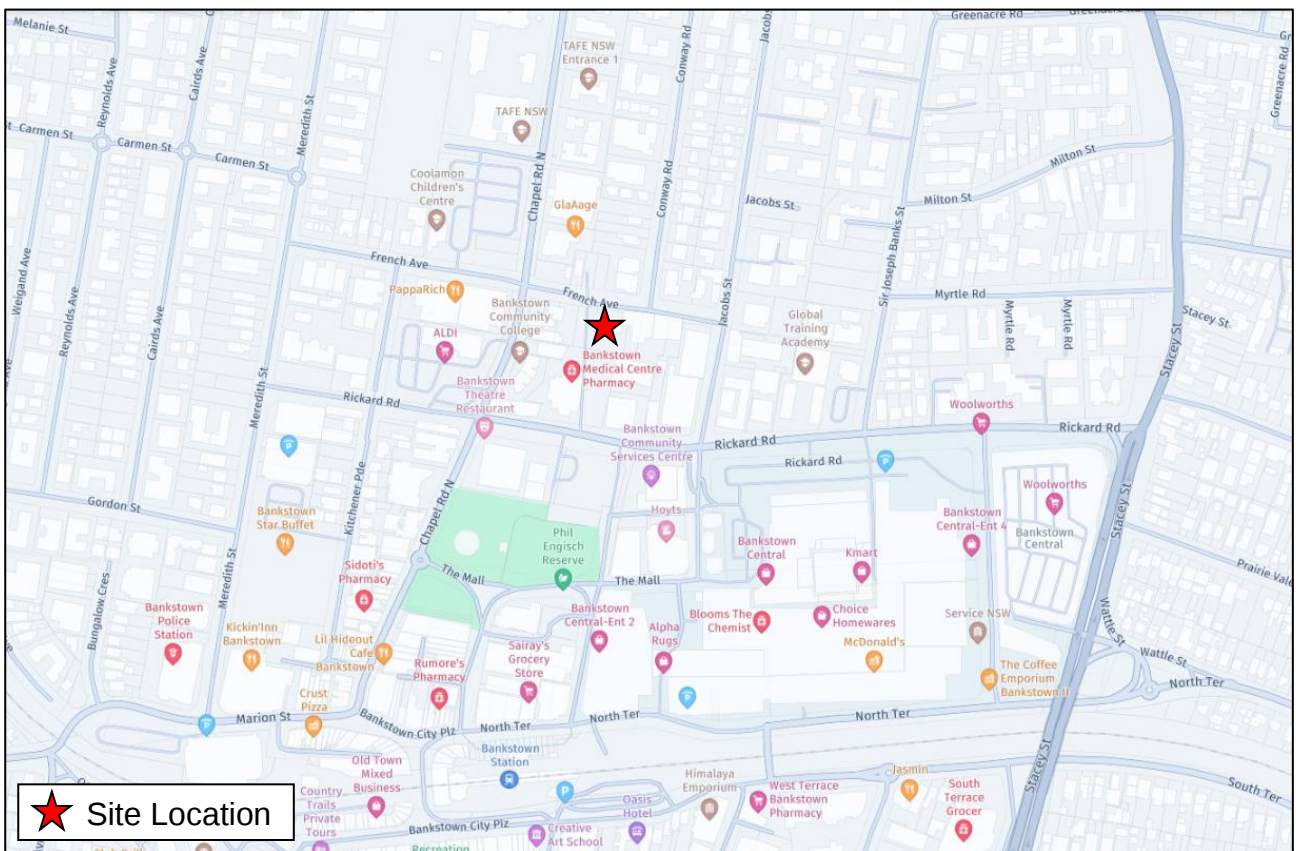


FIGURE 2: SITE CONTEXT – STREET MAP

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 Chapel Road

- TfNSW unclassified REGIONAL Road (No. 7122);
- Within close proximity of the site, Chapel Road has a 13m wide carriageway facilitating one (1) traffic flow lane in each direction and kerbside parking along both sides of the road;
- Signposted 40km/h “High Pedestrian Activity” speed limit, south of Rickard Road towards the Bankstown Centre;
- Generally, signposted 60km/h speed limit at all other areas;
- Parking restrictions are as follows:
 - “No Stopping” and “No Parking” restrictions along the site frontage, south of French Avenue;
 - “No Parking (3:30_{PM} to 6_{PM}, Monday to Friday)” restrictions along the western side of the road, south of French Avenue;
 - Generally, a combination of “1P (8:30_{AM} to 3:30_{PM}, Monday to Friday and 8:30_{AM} to 12:30_{PM}, Saturday)” parking restrictions and “2P (8:30_{AM} to 3:30_{PM}, Monday to Friday and 8:30_{AM} to 12:30_{PM}, Saturday)” parking restrictions along both sides of the road where parking is permitted.

2.1.2 French Avenue

- Unclassified LOCAL Road;
- Approximately 12m wide carriageway facilitating two-way traffic flow and kerbside parking along both sides of the road;
- Signposted 50km/h speed limit;
- Parking restrictions are as follows:
 - “No Stopping, Taxis Excepted (Limit 1 Minute)” restrictions along both sides of the road, east of Chapel Road”;
 - “No Parking” restrictions apply along the frontage of the site at the French Avenue site driveway;
 - “2P (8:30_{AM} to 6:00_{PM}, Monday to Friday and 8:30_{AM} to 12:30_{PM}, Saturday)” parking restrictions along both sides of the road.

2.1.3 Rickard Road

- TfNSW Unclassified REGIONAL Road (No. 7123);
- Generally, 13-18m wide carriageways facilitating two (2) traffic flow lanes in each direction;
- Signposted and linemarked 60km/h speed limit;
- “No Stopping” restrictions along both sides of the road;
- No kerbside parking permitted along either side of the road.

2.1.4 Jacobs Street

- Unclassified LOCAL Road;
- Approximately 11m wide carriageway facilitating two-way traffic flow and kerbside parking on both sides of the road;
- Signposted 50km/h speed limit;
- Parking restrictions are as follows:
 - “1P (8:30_{AM} to 6:00_{PM}, Monday to Friday and 8:30_{AM} to 12:30_{PM}, Saturday)” parking restrictions along both sides of the road, south of French Avenue;
 - Generally, unrestricted kerbside parking permitted along both sides of the road at all other areas.

2.2 **Existing Traffic Management**

- Signalised intersection of French Avenue / Chapel Road;
- Signalised intersection of Chapel Road / Rickard Road;
- Priority controlled intersection of French Avenue / Jacobs Street.

2.3 **Existing Parking Environment**

Parking surveys were undertaken on Sunday, 24 November 2024 and Sunday, 1 December 2024 at 15-minute intervals within 200m walking distance of the subject site between the hours of 7:00_{AM} to 4:00_{PM}.

Figure 4 outlines the extent of the survey area, with the survey results summarised in **Table 3**. The full results are reproduced within **Annexure B** for reference.

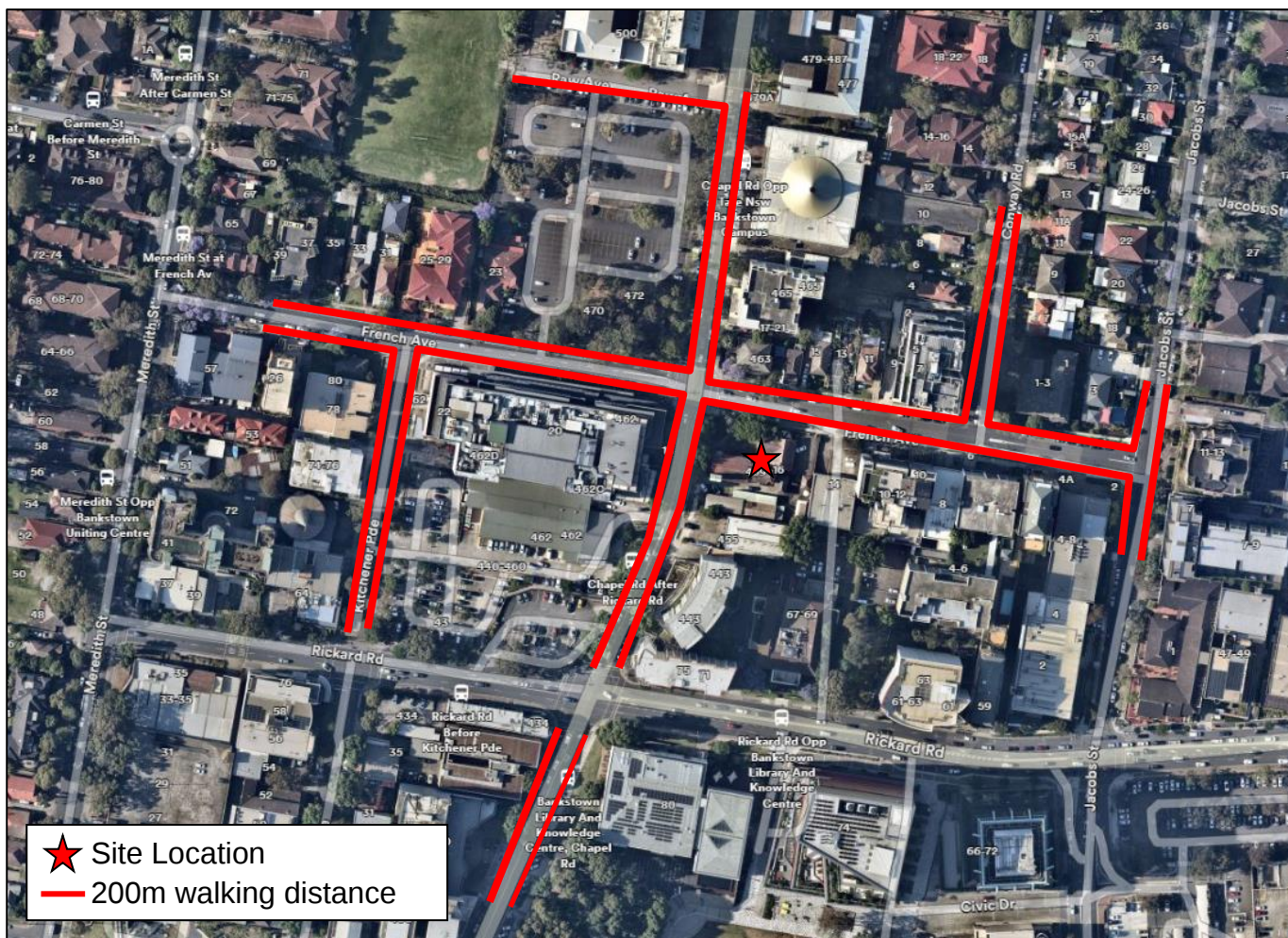


FIGURE 3: PARKING SURVEY – MARKUP

**TABLE 3: EXISTING WEEKDAY PARKING SUPPLY & SPARE CAPACITY
(WITHIN 200M OF THE PROPOSED DEVELOPMENT)**

Parking Zone	Total Capacity	Minimum Spare Capacity	
		Sunday, 24 November 2024	Sunday, 1 December 2024
St Paul's Car Park (via French Avenue)	9 ⁽¹⁾	2 (22.2%) ⁽²⁾	0 (0%) ⁽³⁾
0-200m Walking Distance	198	53 (26.8%) ⁽⁴⁾	23 (11.6%) ⁽⁵⁾

NOTE:

- (1) The capacity of the St Paul's car park is based on the observations of the parking surveyor.
- (2) The minimum spare parking capacity occurred between 10:00_{AM} to 11:30_{AM} for Sunday, 24 November 2024.
- (3) The minimum spare parking capacity occurred between 10:45_{AM} to 11:45_{AM} for Sunday, 24 November 2024.
- (4) The minimum spare parking capacity occurred between 10:30_{AM} to 10:45_{AM} for Sunday, 24 November 2024.
- (5) The minimum spare parking capacity occurred between 1:00_{PM} to 1:15_{PM} for Sunday, 1 December 2024.

As shown, on average, the minimum observed spare parking capacity is **23** spaces out of a total **198** on-street parking spaces within 200m walking distance of the site which corresponds to **11.6%** on-street parking availability during the busiest 15-minute survey peak period.

2.4 Existing Traffic Environment

Turning movement count traffic surveys were conducted at the intersections of Chapel Road / French Avenue, Chapel Road / Rickard Road and French Avenue / Jacobs Street from 7:00_{AM} to 9:30_{AM} and 2:30_{PM} to 6:00_{PM} on Thursday 14 November 2024 and Sunday 17 November 2024 representing a typical operating weekday and weekend. The full survey results are shown in **Annexure B** for reference.

2.4.1 Existing Road Performance

The performance of the surrounding intersections under the existing traffic conditions has been assessed using SIDRA INTERSECTION 9.1. **Table 4** summarises the resultant intersection performance data, with full SIDRA results reproduced in **Annexure C**.

The following considerations have been undertaken to ensure a realistic calibrated model:

- Consideration to the TCS Plan for signalised intersections Rickard Road & Chapel Road (**Annexure D**);
- A review of the phase length and cycle times based upon video footage.
- Validation of the model using approach queue lengths with consideration to the following input modifications:
 - Observed maximum queue lengths along Rickard Road, Chapel Road and French Avenue utilising video footage.

TABLE 4: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.1)

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/veh)	Level of Service ⁽³⁾⁽⁴⁾	Control Type	Worst Movement	95th Percentile Queue
EXISTING WEEKDAY PERFORMANCE							
Chapel Road / Rickard Road	AM	0.60	19.9	B	Signals	RT from Chapel Road	11.2 veh (79.4m) Rickard Road
	PM	0.77	29.1	C		RT from Chapel Road	21.3 veh (152m) Chapel Road
Chapel Road / French Avenue	AM	0.62	14.8	B	Signals	RT from French Avenue	7.1 veh (52.9m) Chapel Road
	PM	0.69	13.8	A		RT from French Avenue	7.3 veh (51.7m) French Avenue
Jacobs Street / French Avenue	AM	0.31	5.3 (Worst: 10.2)	NA (Worst: A)	Stop	RT from French Avenue	1.3 veh (9.5m) French Avenue
	PM	0.37	5.3 (Worst: 11.1)	NA (Worst: A)		RT from French Avenue	1.8 veh (12.9m) French Avenue
EXISTING SUNDAY PERFORMANCE							
Chapel Road / Rickard Road	SUN	0.37	16.4	B	Signals	RT from Chapel Road	7.7 veh (54.3m) Rickard Road
Chapel Road / French Avenue	SUN	0.39	9.6	A	Signals	RT from French Avenue	3.2 veh (22.8m) Chapel Road
Jacobs Street / French Avenue	SUN	0.14	4.9 (Worst: 8.5)	NA (Worst: A)	Stop	RT from French Avenue	0.5 veh (3.7m) French Avenue

Notes:

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

As shown, the signalised intersection of Chapel Road / Rickard Road currently performs at a Level of Service (LoS) “B” during the AM peak hour weekday period and LoS “C” during the PM peak hour weekday period. The LoS “B” performance is characterised by low approach delays and spare capacity. The LoS “C” performance is characterised by satisfactory delays with some spare capacity.

The signalised intersection of Chapel Road / French Avenue currently performs at a LoS “B” during the AM peak hour weekday period and LoS “A” during the PM peak hour weekday period. The LoS “A” and “B” performance is characterised by low approach delays and spare capacity.

The intersection of Jacobs Street / French Avenue performs with a ‘worst movement’ LoS “A” during the AM and PM peak hour weekday periods.

During the weekend, the intersection of Chapel Road / Rickard Road performs at an LoS “B”, the intersection of Chapel Road / French Avenue performs at an LoS “A” and the intersection of Jacobs Street / French Avenue performs at a ‘worst movement’ LoS “A”, indicating that the road network is performing at a high level of efficiency.

2.5 Public Transport

2.5.1 Bus Services

The subject site is within convenient walking distance to several public transport facilities as depicted in **Figure 4**.

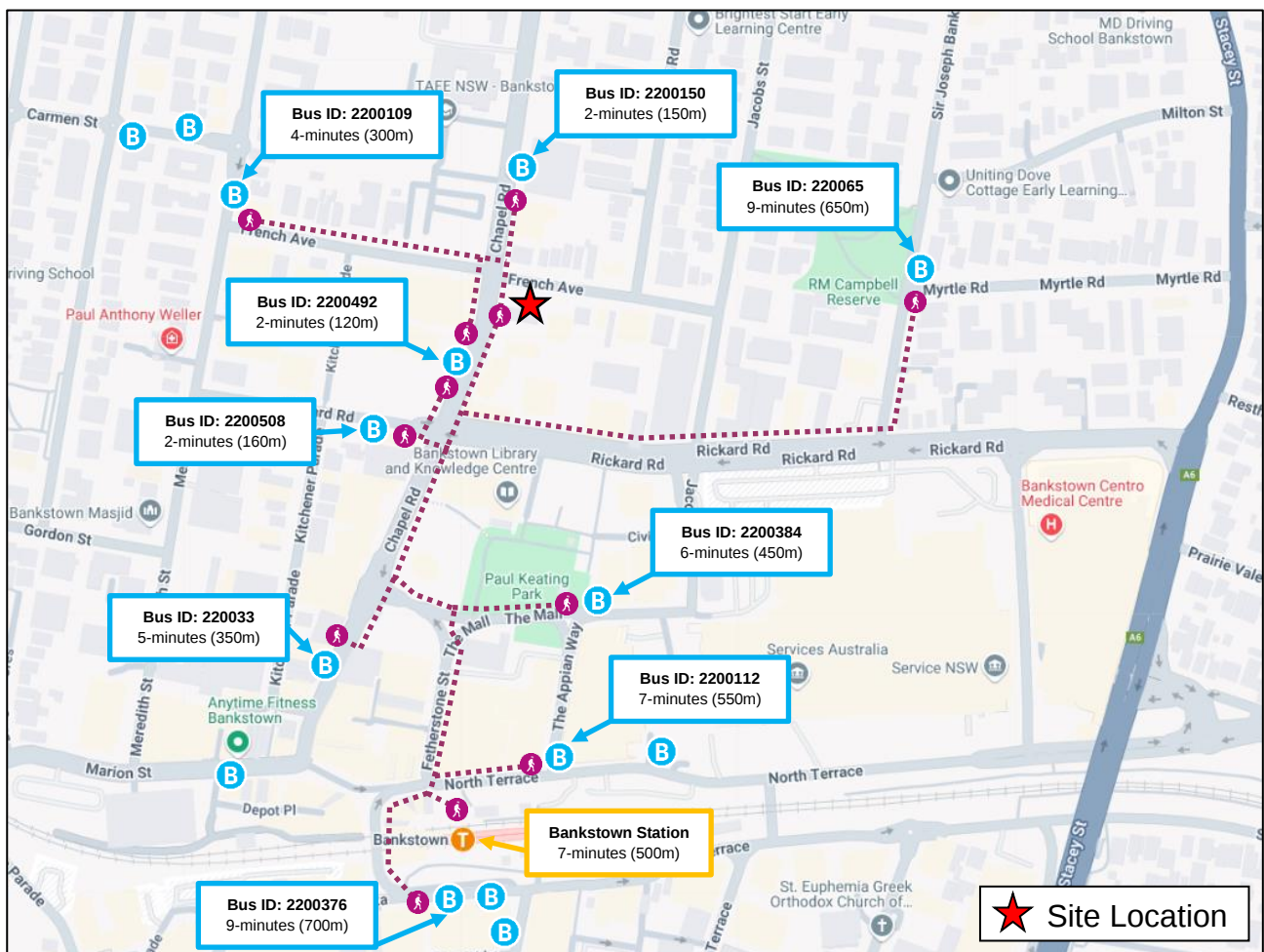


FIGURE 4: PUBLIC TRANSPORT MAP

The bus stops shown above service the following bus routes as shown in **Table 5**.

TABLE 5: BUS ROUTES

Bus Route Number	Bus Route	Bus Service Provider
905	Bankstown to Fairfield	Transit Systems NSW
907	Bankstown to Parramatta via Bass Hill	Transit Systems NSW
908	Merrylands to Bankstown via Auburn and Birrong	Transit Systems NSW
909	Bankstown to Parramatta via Auburn and Birrong	Transit Systems NSW
911	Auburn to Bankstown via Georges Hall	Transit Systems NSW
913	Strathfield to Bankstown	Transit Systems NSW
920	Bankstown to Parramatta	U-Go Mobility
925	East Hills to Lidcombe via Bankstown	Transit Systems NSW
939	Greenacre to Bankstown	U-Go Mobility
960	Sutherland Station to Bankstown Central	U-Go Mobility
M90	Burwood to Liverpool	Transit Systems NSW
M91	Hurstville to Parramatta via Chester Hill and Pads	Transit Systems NSW

As shown, the subject site is well serviced by bus services that are within convenient walking distance of the site. The bus operator map extracts for Transit Systems and U-Go Mobility are presented in **Figure 5** and **Figure 6**, respectively.

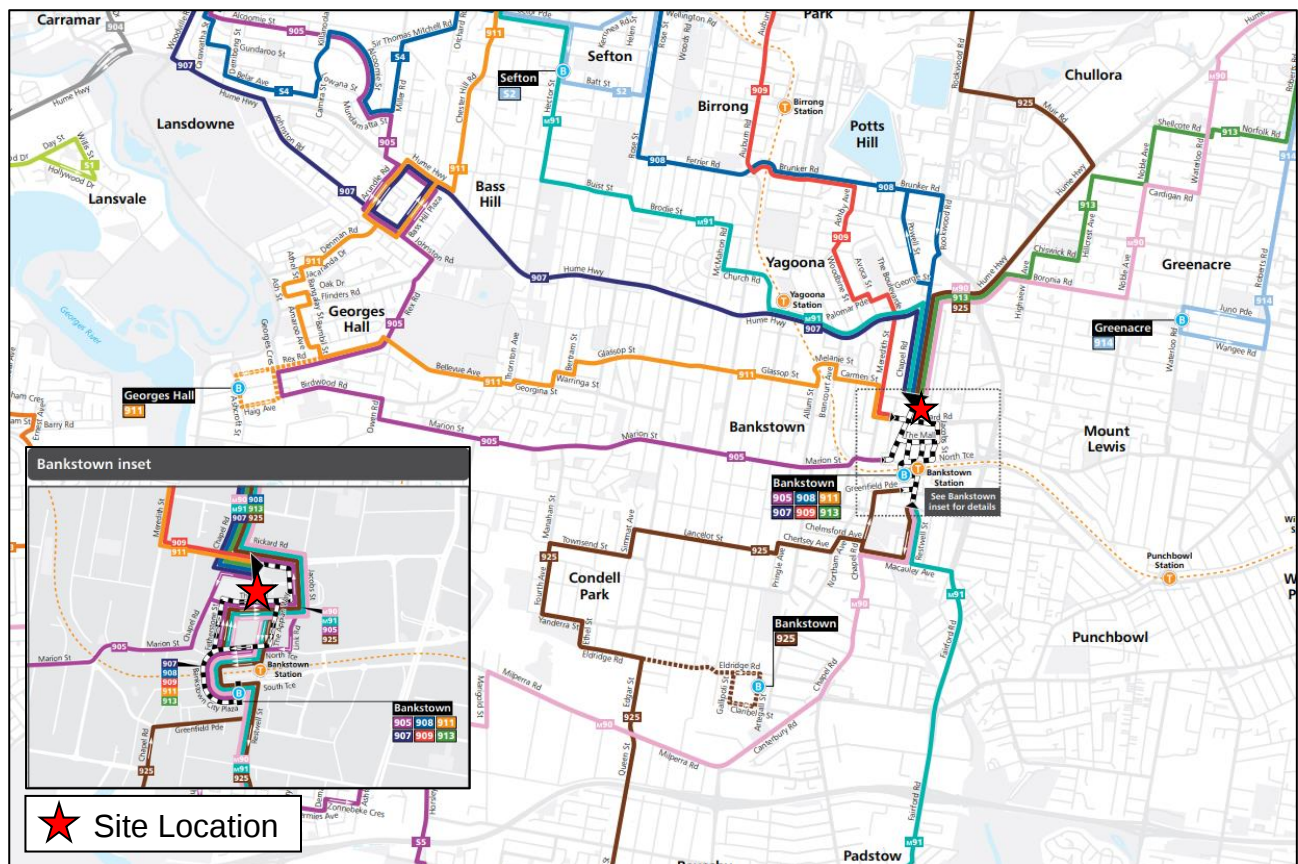


FIGURE 5: TRANSIT SYSTEMS NSW – BUS OPERATOR MAP

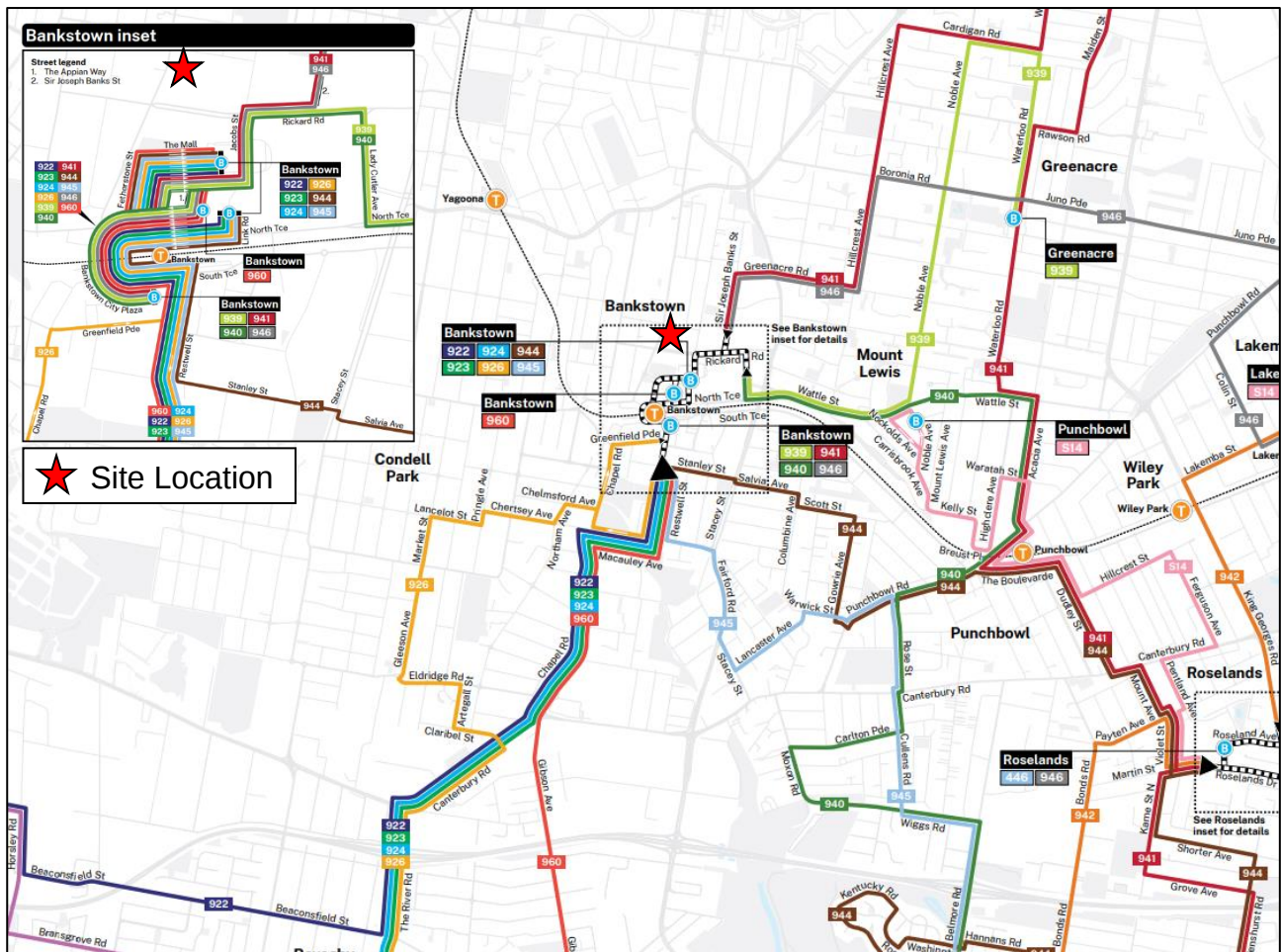


FIGURE 6: U-GO MOBILITY – BUS OPERATOR MAP

2.5.2 Train Services

Bankstown Train Station is within 7-minute (500m) walking distance of the site to the south. It is noted that at the date of the creation of this report, Bankstown Train Station is currently not in operation and is undergoing planned upgrades to incorporate a new Sydney Metro Station, further detailed in **Section 2.6**.

2.6 Future Road and Infrastructure Upgrades

2.6.1 Bankstown Metro Station

Bankstown Station is currently undergoing upgrades to incorporate a new Metro Station. In accordance with the NSW Sydney Metro website, Bankstown Station is expected to service “15 trains per hour” during the morning peak period. Further, the Metro services are expected to reduce travel time by up to 25-minutes to some destinations. The increased Metro service frequency and decreased travel times is likely to make the Metro an attractive travel mode for people which will reduce private vehicle reliance. The reduction of private vehicle reliance is in line with the objectives of the *Canterbury-Bankstown Development Control Plan 2023* for the Bankstown City Centre.

From the Canterbury-Bankstown Council Development Application tracker and TfNSW Projects website, it appears that there are no further future planned road or public transport changes that will affect traffic conditions within the immediate vicinity of the subject site.

3 **PARKING ASSESSMENT**

3.1 **Council Car Parking Requirements**

3.1.1 Canterbury Bankstown Council Car Parking Requirements

The subject site is located within the 'outside core' of Bankstown City Centre. As such, reference is made to the *Canterbury Bankstown Development Control Plan 2023 (CBDCP 2023)* – Chapter 6.2: *Bankstown City Centre* which outlines the following car parking requirements:

Land Use	Size / Description	Outside of Bankstown Core City	
		Minimum car parking rate	Maximum car parking rate
Residential flat buildings / Shop top housing	Studio	0 space per dwelling	0.75 space per dwelling
	1 Bedroom	0.2 space per dwelling	0.75 space per dwelling
	2 Bedroom	0.5 space per dwelling	1.5 space per dwelling
	3 Bedrooms	1 space per dwelling	2 space per dwelling
	Visitor	0	1 space per 5 dwelling
Office Premises	N/A	1 space per 100m ²	2 spaces per 100m ²
Retail Premises	Shops	1 space per 100m ²	2 spaces per 100m ²
All Other Land Uses	Refer to Chapter 3.2 – Parking of the CBDCP 2023		

Further reference is made to *CBDP 2023* – Chapter 3.2: *Parking* which outlines the car parking requirements for other land uses not considered above:

Centre-based child care facilities

1 car space per 4 children; and 2 additional car spaces for the exclusive use of any associated dwelling.

Place of public worship

Place of public worship that is located outside a centre (B2, B4 Zone) and where the gross floor area of the assembly area greater than 500m²:

- 1 car space per 5m² of the assembly area, however this rate is to be validated through a parking study, to be submitted with the application
- In addition to the requirements of Chapter 10.5, the parking study must consider other comparable places of public worship in terms of building size, worshipper capacity, type of worship (i.e. seated or unseated). Accessibility and potential use of alternative means of transport, existing short term parking availability and vehicle occupancy rates. The parking study should correlate with the submitted plan of management.
- Car parking for ancillary uses and social/special events must be provided on-site on the basis of a parking study to be submitted with the application.

It is noted that car parking for 'affordable rental housing' is also provided within the *State Environmental Planning Policy Housing 2021 (SEPP Housing 2021)*. The CBDCP 2023 car parking requirements for the residential dwellings were utilised to determine car parking requirements as it is the lesser of the two (2) car parking rates for residential flat building dwellings. **Table 6** presents the 'minimum' parking requirements of the proposal according to CBDCP 2023 above car parking rates.

TABLE 6: CBDCP 2023 CAR PARKING POLICY

Land Use	Type	Scale	Rate	Spaces Required	Spaces Provided
Residential Flat Building (Affordable Rental Housing Units) ⁽¹⁾	Studio	41 units	0 spaces per dwelling	0	30 ⁽⁴⁾
	1-bedroom	144 units	0.2 spaces per dwelling	28.8	
	3+ bedroom	1 unit	1 space per dwelling	1	
Office Premises ⁽¹⁾	-	354m ² GFA	1 space per 100m ² GFA	3.5	4
Retail Premises ⁽¹⁾	-	172m ² GFA	1 space per 100m ² GFA	1.7	3
Child Care Centre ⁽¹⁾	-	50 children	1 space per 4 children	12.5	13 ⁽³⁾
SUB TOTAL	-	-	-	48 (47.5)	50
Place of Worship ⁽²⁾	Assembly Area	480m ²	1 space per 5m ² GFA	96	13 ⁽³⁾
TOTAL	-	-	-	145 (144.2)	50

NOTES:

- (1) Minimum car parking rates applied.
- (2) A car parking study for the proposed place of worship has been undertaken and is further detailed in **Section 3.2**.
- (3) Place of Worship car parking is to be shared with the Child Care Centre as operational hours do not coincide.
- (4) Including rectory car parking space.

As shown, strict application of the CBDCP 2023 car parking rates requires the provision of **145** car parking spaces. The proposed plans detail the provision of **50** car parking spaces, resulting in a numerical shortfall of **95** car parking spaces to CBDCP 2023 which is associated with the Place of Worship. A car parking study has been undertaken within **Section 3.2** to determine the appropriate car parking demand for the proposed Place of Worship component.

3.2 Place of Worship – Car Parking Demand Study

3.2.1 Place of Worship Proposal

The existing operational place of worship has advised MTE of a maximum capacity of **350** patrons. The proposed plans (as depicted in **Annexure A**) detail a maximum capacity of **509** patrons, which is an increase of **159** patrons from existing operations. The place of

worship currently operates with three (3) services every Sunday including an 8am service, 10am service and 2pm service.

Under existing conditions, the place of worship provides a hardstand area via French Avenue to provide informal parking to the place of worship staff. According to the parking surveys undertaken of the hardstand area (detailed in **Section 2.3**), the hardstand area can accommodate a maximum of nine (9) cars.

3.2.2 Scope of Place of Worship Parking Study

Whilst the existing place of worship can accommodate a maximum of 350 patrons, it is expected that the place of worship would only meet the maximum capacity during peak events (i.e. Christmas and Easter). In a typical week, the Sunday services are the peak period for patrons, however this peak is much less than the sites maximum capacity.

As such, the car parking demand assessment for the future patronage figures will focus on the expected number of patrons to attend a typical Sunday service.

3.2.3 Existing Place of Worship – Travel Mode Survey

Travel mode surveys were conducted on Sunday, 24 November 2024 and Sunday, 1 December 2024. The 8am and 2pm service responses were manually collected on-site, and the 10am responses were collected via an online survey. The complete travel mode survey questionnaire is provided in **Annexure E** for reference.

It is acknowledged that the surveys may not have wholly captured the response of every individual in attendance. The existing place of worship has advised that the 10am session is the busiest with a typical attendance of 60 adults and 30 children, which aligns with the distribution of responses for the travel mode survey (i.e. the quantity of responses indicates that the 10am session was the busiest session).

The following questions were included within the travel mode survey:

- How did you arrive to church today?
 - Car (as driver), passenger in car, train (due to the closure of Bankstown Station, select this option if the train is your usual mode of transport), public bus, only walked, bicycle, motorcycle, taxi/uber, other.
- If you drove, how many passengers were in the car with you?
- If you drove, where did you park?
 - On-site, on-street, public car park,
- If you drove, parked 'On-Street' or 'Public Car Park', what street/car park did you park in?
- How will you depart church today?

- Car (as driver), passenger in car, train (due to the closure of Bankstown Station, select this option if the train is your usual mode of transport), public bus, only walked, bicycle, motorcycle, taxi/uber, other.

The travel mode survey results are summarised in **Table 7**, below.

TABLE 7: TRAVEL MODE SURVEY SUMMARY

Travel Mode	Service		
	8am	10am	2pm
Sunday, 24 November 2024			
Car, as driver	9 (64%)	31 (66%)	9 (32%)
Car, as passenger	3 (22%)	12 (26%)	5 (18%)
Train	0	1 (2%)	1 (4%)
Bus	1 (7%)	0	4 (14%)
Walked	1 (7%)	3 (6%)	7 (25%)
Taxi/Uber	0	0	2 (7%)
Total Respondents	14	47	28
Sunday, 1 December 2024			
Car, as driver	11 (65%)	30 (67%)	11 (32%)
Car, as passenger	3 (17%)	13 (29%)	5 (15%)
Train	0	0	2 (6%)
Bus	1 (6%)	0	5 (15%)
Walked	2 (12%)	2 (4%)	9 (26%)
Taxi/Uber	0	0	2 (6%)
Total Respondents	17	45	34

The key findings from the travel mode surveys include the following:

- People attending the 8am and 10am session have similar travel mode choices with approximately 66% of adult patrons driving to the subject site on average;
- People attending the 2pm session are more likely to utilise alternate modes of transport with 32% of adult patrons driving to the subject site. Public and active transport modes are a viable transport mode for patrons attending the 2pm session.
- Very few people utilise public transport to travel to/from the subject site during the 10am session. There is a large potential to increase public transport usage.

3.2.4 Parking Study Limitations

The following limitations were determined as a part of this parking study:

- It is acknowledged that the survey responses may not have captured the response of every individual.
- The survey question about train use was designed to account for train users; however, the closure of Bankstown Station likely discouraged many individuals from using the train to travel to and from the subject site. The extent to which Bankstown Station influences the transport mode choices of patrons remains uncertain.
- It is difficult to estimate the number of patrons generated as a result of the additional maximum capacity. However, it is unlikely that the number of patrons driving to and

from the site would rise significantly, given that the place of worship is currently operating at approximately 26% of its maximum capacity (as reported by the existing place of worship). As a result, the increased maximum capacity is expected to have minimal impact on traffic. Any additional patrons are more likely to result from the increased residential density associated with the proposed residential units, and these patrons are not expected to drive to the site.

- The parking surveys undertaken (see **Section 2.3**) focused exclusively on available on-street and on-site parking. However, it was observed that several patrons utilised off-street parking facilities at locations such as 'Little Saigon Plaza,' 'TAFE,' 'Aldi,' and 'Bankstown Central.' While this practice is not encouraged, it does alleviate some of the demand on on-street kerbside parking spaces.

3.2.5 Estimated Car Parking Demand

The following assumptions were considered for the purposes of estimating the car parking demand of the proposed place of worship:

- Only the 10am Sunday service is considered, as it is the busiest service.
- 26% increase in place of worship capacity, which is assumed to translate to a 26% increase in patronage at the 10am Sunday service. This is equivalent to 41 additional patrons.
- 66% of the additional patrons are adults. This is equivalent to an additional 28 adults.
- Drivership rate of 67% based on the travel mode survey results.

Application of the assumptions above, results in an additional **19** 'drivers' to the proposed place of worship for a typical 10am Sunday Service. It is expected that any additional drivers to the subject place of worship can be accommodated by the available on-street car parking, as determined by the parking surveys with minimum observed **23** car parking spaces available within 200m walking distance of the site.

3.2.6 Proposed Car Parking Provision for Place of Worship Patrons

Under existing conditions, the subject place of worship provides car parking for the ministry members only within the rear hardstand area accessed via French Avenue. The rear hardstand area was observed to informally accommodate nine (9) vehicles.

Under future conditions, it is proposed that the site continues to provide nil (0) car parking spaces for visitors with all on-site spaces dedicated to the staff associated with the operation of the place of worship. The client has advised that the place of worship is not expected to demand a significant increase in staff, with one (1) additional staff expected per session under the future case.

In any case, the proposal includes the formalisation of **13** ministry car parking spaces, including the nine (9) existing hardstand spaces and a further four (4) additional spaces. The ground floor spaces are proposed to be shared with the child care centre. The child care centre and place of worship operation hours do not coincide at all and therefore the shared-use of the car parking spaces can be easily managed. It is recommended that each of the

child care centre / ministry car parking spaces on the ground floor be appropriately signposted/linemarked as “Child Care Centre Car Parking (7:00_{AM} – 6:30_{PM}, Monday to Friday), Ministry Car Parking at All Other Times”.

3.2.7 Additional Car Parking Considerations

Reference is made CBDCP 2023 – Chapter 6.2: Bankstown City Centre which outlines the following objectives relevant to parking:

5.2.1 On-site parking

Objectives

- O1. *Promote sustainable transport use by restricting private parking and facilitating access to, and use of, communal modes of transport within the Bankstown City Centre.*
- O2. *Ensure that adequate parking is provided to service the needs of the development and reduce the impacts on local roads.*
- O3. *Encourage basement vehicular parking throughout the centre.*
- O4. *Provide flexibility for the efficient use of car parking in development by allow off-site users to use car parking.*
- O5. *Where provided, design above ground car parking so that it can be adapted to alternate uses over time*
- O6. *Limit vehicular movement through the city centre core*
- O7. *Consider the location of car park and service vehicle entrances and exits to ensure the amenity of public domain is maintained and improved where possible*
- O8. *Ensure that new car parking can be part of a unified parking system in Bankstown City Centre that includes both public and private car parks. This system will share data and use smart technology to make parking easier and more efficient.*
- O9. *Ensure that all modes of transport—pedestrian, cycling, public transport, and freight—are well-connected to foster economic activity and enhance accessibility for everyone in Bankstown City Centre.*

The Bankstown City Centre is undergoing significant policy changes aimed at reducing reliance on private vehicle use. These changes include limiting the provision of private car parking spaces and ensuring strong connectivity across all modes of transport. The proposal to provide nil (0) visitor parking spaces for the place of worship may encourage visitors to utilise alternative transport options, such as public buses and, in the future, the new Bankstown Metro. This approach aligns with current Bankstown car parking provision for office and retail premises, where car parking rates are capped at a ‘maximum’ to discourage excessive on-site parking and promote sustainable transport choices.

3.2.8 Resulting Provision of Car Parking for the Proposed Development

In summary, the proposal includes the provision of car parking spaces as per the following:

- A total of **50** car parking spaces, including:
 - **30** car parking spaces allocated to residential component, satisfying CBDCP 2023 car parking requirements;
 - **4** car parking spaces associated with the office premises, satisfying CBDCP 2023 car parking requirements;
 - **3** car parking spaces associated with the retail premises, satisfying CBDCP 2023 car parking requirements;
 - **13** car parking spaces associated with the child care centre, satisfying CBDCP 2023 car parking requirements;
 - These spaces are to be shared with the place of worship. Operationally, the child care centre and place of worship do not conflict with each other.

3.3 Bicycle & Motorcycle Parking Requirements

3.3.1 Bicycle Parking Requirements

Reference is made to *CBDP 2023 – Chapter 6.2 – Section 5.2.3: Bicycle Parking and End of Trip Facilities* which outlines the following bicycle parking requirements:

Land Use	Size / Description	Bicycle Parking Rates	End-of-trip Facility Rates
Residential flat buildings / Shop top housing	Studio	1 secure space per 3 dwellings	
	1 Bedroom	1 secure space per 3 dwellings	
	2 Bedroom	1 secure space per 3 dwellings	-
	3 Bedrooms	1 secure space per 3 dwellings	
	Visitor	1 visitor bicycle space per 10 dwellings	
Office Premises	N/A	1 secure bicycle space per 200m ²	1 staff shower and change room for every 10 secure bicycle parking spaces required by the DCP.
Retail Premises	Shops	1 space per 100m ²	2 spaces per 100m ²
All Other Land Uses	Applicant is required to demonstrate the number of bicycle spaces is consistent with the requirements in <i>CBDP 2023 – Chapter 3.2 Section 2–Off-Street Parking Rates</i> and that end of trip facilities are provided at an appropriate rate		

Further reference is made to *CBDP 2023 – Chapter 3.2* which outlines the following bicycle parking rates for the child care centre and place of worship component:

Centre-based child care facilities

1 space per 4 staff

Places of Worship

Visitors: 1 space per 20

The resulting CBDCP 2023 bicycle parking requirements are summarised in **Table 8**.

TABLE 8: CBDCP 2023 BICYCLE PARKING PROVISION

Land Use	Type	Scale	Rate	Spaces Required	Spaces Provided
Residential Flat Building (Affordable Rental Housing Units)	Studio	41 units	1 space per 3 dwellings	62	94
	1-bedroom	144 units	1 space per 3 dwellings		
	3+ bedroom	1 unit	1 space per 3 dwellings		
	Visitors	185 units	1 visitor bicycle space per 10 dwellings	18.5	
Office Premises	-	354m ² GFA	1 secure bicycle space per 200m ²	2.0 (1.8)	
Retail Premises	-	172m ² GFA	1 space per 100m ²	1.7	
Child Care Centre	-	9	1 space per 4 staff	2.3	
Place of Worship	-	131 patrons ⁽¹⁾	1 space per 20	6.6	
TOTAL	-	-	-	93 (92.9)	94

NOTE:

- (1) Under existing conditions, the place of worship does not provide any bicycle parking. It is proposed that bicycle parking is provided for the 'typical' patronage of the Sunday 10am service, which is 131 patrons (90 existing + 41 future).

Applying the above rates, results in a bicycle parking requirement of **93** bicycle spaces. The proposed plans detail the provision of **94** bicycle parking spaces, exceeding CBDCP 2023 bicycle parking policy.

3.3.2 Motorcycle Parking Requirements

The CBDCP 2023 does not outline any motorcycle parking requirements. As such, nil (0) motorcycle parking spaces are proposed, satisfying CBDCP 2023 motorcycle parking requirements.

3.4 **Servicing & Loading**

Reference is made to *CBDP 2023 – Chapter 6.2 – Section 5.8: Waste management* which outlines the following servicing and loading requirements:

Controls

- C1. *For large developments, or developments where Council determines collect and return is unsuitable, ensure that waste collection activities exclusively occur on-site via an HRV per the Australian Standards 2890.2 preventing disruptions to shared laneways and maintaining visual and functional quality of these spaces.*

A dedicated loading bay suitable for 12.5m length Heavy Rigid Vehicle (HRV) has been provided within the ground floor car park. Swept paths have been undertaken demonstrating successful HRV access and egress of the site and loading bay, with results presented in **Annexure F**.

It is recommended that servicing or loading activities involving an HRV be scheduled outside the peak operating hours of the childcare centre to minimize potential conflicts with visitors and ensure safety. Nevertheless, the design allows for the safe two-way passage between a B99 and B85, even when an HRV is parked within the dedicated loading bay.

3.5 Car Park Design & Compliance

The car parking layout as depicted in **Annexure A**, has been assessed to achieve the relevant clauses and objectives of AS2890.1:2004, AS2890.2:2018, AS2890.3:2015 and AS2890.6:2022. Swept path testing has been undertaken, and the results are reproduced within **Annexure F** for reference.

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

- 9.8m wide two-way driveway (measured at the property boundary) facilitating access to French Avenue;
- Minimum 7.5m wall-to-wall width along ramp;
- Compliant ramp grades not exceeding 25% for private developments and no grade change greater than 12.5;
- Minimum 2.6m wide x 5.4m long car parking spaces for child care centre visitors;
- Minimum 2.4m wide x 5.4m long car parking spaces for residents and staff;
- Minimum 5.8m wide parking aisles:
 - 1m wide footpath behind child care centre visitor spaces providing safe pedestrian connectivity to the building entrance.
- Minimum 5.4m long, 2.4m wide accessible spaces with adjacent associated 5.4m long, 2.4m wide shared space;
- Minimum headroom of 2.2m for general circulation and 2.5m headroom clearance provided over accessible and adaptable parking areas;
- Minimum headroom of 4.5m where manoeuvring is required by a Heavy Rigid Vehicle;

- Dedicated loading may with minimum dimensions of 3.5m wide and 12.5m length for Heavy Rigid Vehicles (HRV);

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

3.6 Variations from Standards

3.6.1 Column Within Pedestrian Sight Triangle

Under AS2890.1:2004 – *Figure 3.3*, the pedestrian sight triangles are to be kept clear of obstructions. The proposed plans depict a structural column being located within the pedestrian sight triangle. The column extent of obstruction to the sight triangle is minimal and a driver will be able to observe if a pedestrian is located on either side of the column. Further, due to the large width of the driveway, it is likely that a driver would be positioned away from the column such that the pedestrian sight triangle is maintained from the egress point. This minor departure from the standards is acceptable.

3.7 Proposed Parking Restriction Change

It is proposed that a ‘drop-off’ zone is provided along the frontage of the site for the length of three (3) car parking space. The ‘drop-off’ zone will serve as short-turnover spaces for visitors to the subject site. The request for parking restriction changes can be formally made to the Local Traffic Committee once development approval is obtained.

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**

4.1.1 Vehicle Trip Generation Rates

The traffic generation rates for the relevant land uses are provided in the *TfNSW Guide to Transport Impact Assessment* (TfNSW Guide), which supersedes the *RTA Guide to Traffic Generating Developments (2002)*. Where traffic generation rates are not provided in the TfNSW Guide, the RTA Guide has been referenced. The relevant traffic generation rates are as follows:

TfNSW Guide

Office blocks (2010)

AM peak hour (Sydney) 1.69 vehicle trips/100m² GFA

PM peak hour (Sydney) 1.20 vehicle trips/100m² GFA

Child care centres (2015)

Long-day care

Site AM peak hour 0.81 vehicle trips/licensed child places

Site PM peak hour 0.80 vehicle trips/licensed child places

TDT 2013/04a

High density residential flat dwellings – Weekday Rates

AM peak hour (Sydney) 0.15 vehicle trips per car space

PM peak hour (Sydney) 0.12 vehicle trips per car space

RTA Guide

3.6.1 Shopping centres.

Thursday:

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

Saturday:

$$V(P) = 38 A(S) + 13 A(F) + 147 A(SM) + 107 A(SS)$$

Where:

A(SS): Specialty shops, secondary retail GLFA...

It should be noted that the traffic generation rates typically apply to unconstrained sites (i.e. sites which do not have any car parking restrictions). The subject site is a constrained site and as such, it is more appropriate to estimate the traffic generation based on a first principles approach specifically for the retail, commercial and place of worship land uses. The first principles assessment is outlined in **Section 4.1.2**.

4.1.2 First Principles Assessment – Traffic Generation Estimate

A first principles assessment has been undertaken to estimate the future traffic generation of the subject site. To ensure a conservative assessment, the following assumptions are considered:

- **Weekday Assumptions:**

- Each commercial and retail car parking space generates one (1) inbound vehicle trip during the weekday AM peak hour period, and one (1) outbound vehicle trip during the weekday PM peak hour period;
- The *TDT 2013/04a* traffic generation rate for high-density residential units is applied;
- The place of worship does not generate any traffic during the weekday AM and PM network peak hour periods;
- The traffic generation rates outlined within the TfNSW guide for the child care centre is applied as usual;
- The TfNSW Guide and RTA Guide does not provide Sunday traffic generation rates. As such, the weekday PM peak hour traffic generation rates have been applied to the Sunday network peak hour period.

- **Sunday Assumptions:**

- Each commercial and retail car parking space generates one (1) vehicle trip during the Sunday network peak hour;
- The *TDT 2013/04a* traffic generation rate for high-density residential units is applied;
- Each place of worship car parking space generates one vehicle trip during the Sunday network peak hour.
- The child care centre does not generate any traffic during the Sunday network peak hour period.
- The TfNSW Guide and RTA Guide does not provide Sunday traffic generation rates. As such, the weekday PM peak hour traffic generation rates have been applied to the Sunday network peak hour period.

The traffic generation estimate based on the assumptions above is summarised in in **Table 9**.

TABLE 9: FIRST PRINCIPLES – ESTIMATED TRAFFIC GENERATION

Use	Scale	Peak	Generation Rate	Trips ⁽¹⁾
Weekday Traffic Generation Estimate				
High Density Residential ⁽¹⁾	30 spaces	AM	0.15 trips per space	5 trips (1 in, 4 out)
		PM	0.12 trips per space	4 trips (3 in, 1 out)
Retail Premises	5 spaces	AM	1 inbound trip per space	5 trips (5 in, 0 out)
		PM	1 outbound trip per space	5 trips (0 in, 5 out)
Commercial Premises	8 spaces	AM	1 inbound trip per space	8 trips (8 in, 0 out)
		PM	1 outbound trip per space	8 trips (0 in, 8 out)
Child Care Centre ⁽²⁾	50 children	AM	0.81 trips per child	41 trips (21 in, 20 out)
		PM	0.8 trips per child	40 trips (20 in, 20 out)
TOTAL	-	AM	-	59 trips (35 in, 24 out)
		PM		58 trips (23 in, 35 out)
Sunday Traffic Generation Estimate				
High Density Residential ⁽³⁾	30 spaces	Network Peak	0.15 trips per space	5 trips (4 in, 1 out)
Retail Premises ⁽⁴⁾	5 spaces	Network Peak	1 trip per space	5 trips (3 in, 2 out)
Commercial Premises ⁽⁴⁾	8 spaces	Network Peak	1 trip per space	8 trips (4 in, 4 out)
Place of Worship	18 spaces	Network Peak	1 outbound trip per space	18 trips (0 in, 18 out)
TOTAL	-	Network Peak	-	36 trips (11 in, 25 out)

Notes:

- (1) 20% inbound and 80% outbound assumed for the AM peak hour period, vice versa for the PM peak hour period;
- (2) 50% inbound and 50% outbound assumed for the AM and PM peak hour periods;
- (3) 80% inbound and 20% outbound assumed for the Sunday network peak hour period;
- (4) 50% inbound and 50% outbound assumed for the Sunday network peak hour period.

As shown, the expected weekday traffic generation associated with the proposed development is in the order of **59** vehicle trips in the AM peak period (35 in, 24 out) and **58** vehicle trips in the PM peak period (23 in, 35 out).

The expected weekend (Sunday) traffic associated with the proposed development is in the order of **36** vehicle trips (11 in, 25 out) during the Sunday network peak hour period.

4.2 Traffic Assignment

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

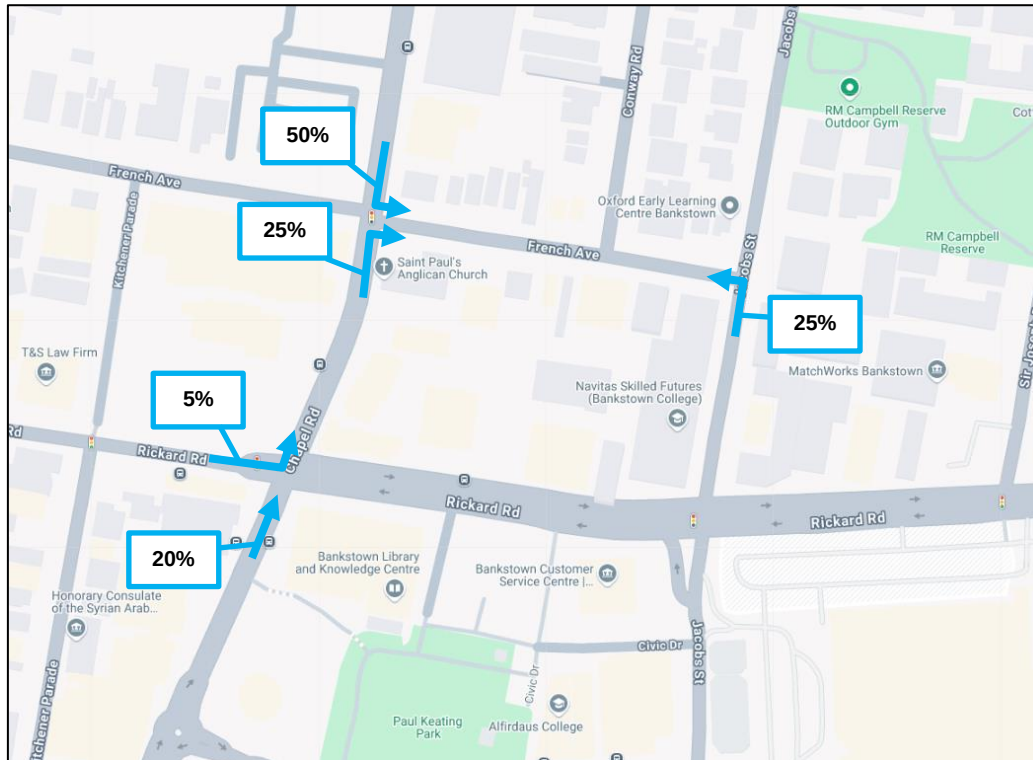


FIGURE 7: TRAFFIC DISTRIBUTION – INBOUND

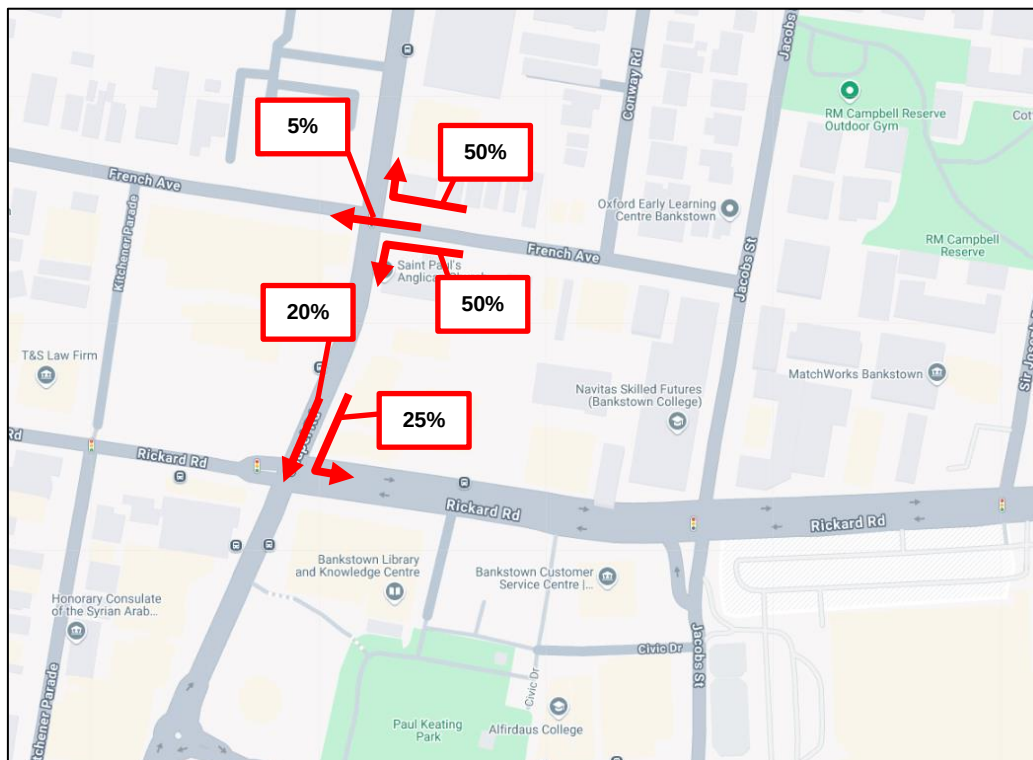


FIGURE 8: TRAFFIC DISTRIBUTION – OUTBOUND

4.3 Traffic Impact

The traffic generation outlined in **Section 4.1 & 4.2** above has been added to the existing traffic volumes recorded. SIDRA INTERSECTION 9.1 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 10**.

TABLE 10: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.1)

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/veh)	Level of Service ⁽³⁾⁽⁴⁾	Control Type	Worst Movement	95th Percentile Queue
EXISTING WEEKDAY PERFORMANCE							
Chapel Road /Rickard Road	AM	0.60	19.9	B	Signals	RT from Chapel Road	11.2 veh (79.4m) Rickard Road
	PM	0.77	29.1	C		RT from Chapel Road	21.3 veh (152m) Chapel Road
Chapel Road /French Avenue	AM	0.62	14.8	B	Signals	RT from French Avenue	7.1 veh (52.9m) Chapel Road
	PM	0.69	13.8	A		RT from French Avenue	7.3 veh (51.7m) French Avenue
Jacobs Street /French Avenue	AM	0.31	5.3 (Worst: 10.2)	NA (Worst: A)	Stop	RT from French Avenue	1.3 veh (9.5m) French Avenue
	PM	0.37	5.3 (Worst: 11.1)	NA (Worst: A)		RT from French Avenue	1.8 veh (12.9m) French Avenue
EXISTING SUNDAY PERFORMANCE							
Chapel Road /Rickard Road	SUN	0.37	16.4	B	Signals	RT from Chapel Road	7.7 veh (54.3m) Rickard Road
Chapel Road /French Avenue	SUN	0.39	9.6	A	Signals	RT from French Avenue	3.2 veh (22.8m) Chapel Road
Jacobs Street /French Avenue	SUN	0.14	4.9 (Worst: 8.5)	NA (Worst: A)	Stop	RT from French Avenue	0.5 veh (3.7m) French Avenue
FUTURE (POST-DEVELOPMENT) WEEKDAY PERFORMANCE							
Chapel Road /Rickard Road	AM	0.60	19.9	B	Signals	RT from Chapel Road	11.2 veh (79.7m) Rickard Road
	PM	0.79	29.3	C		RT from Chapel Road	22 veh (156.6m) Chapel Road
Chapel Road /French Avenue	AM	0.62	15.3	B	Signals	RT from French Avenue	7.5 veh (55.9m) Chapel Road
	PM	0.70	19.2	B		RT from French Avenue	11.5 veh (84m) Chapel Road
Jacobs Street /French Avenue	AM	0.31	5.3 (Worst: 10.2)	NA (Worst: A)	Stop	RT from French Avenue	1.3 veh (9.5m) French Avenue
	PM	0.37	5.3 (Worst: 11.2)	NA (Worst: A)		RT from French Avenue	1.9 veh (13m) French Avenue
FUTURE (POST-DEVELOPMENT) SUNDAY PERFORMANCE							
Chapel Road /Rickard Road	SUN	0.38	16.4	B	Signals	RT from Chapel Road	7.7 veh (54.3m) Rickard Road

Intersection	Peak Hour	Degree of Saturation ⁽¹⁾	Average Delay ⁽²⁾ (sec/veh)	Level of Service ⁽³⁾⁽⁴⁾	Control Type	Worst Movement	95th Percentile Queue
Chapel Road / French Avenue	SUN	0.39	10	A	Signals	RT from French Avenue	3.2 veh (23m) Chapel Road
Jacobs Street / French Avenue	SUN	0.14	4.9 (Worst: 8.5)	NA (Worst: A)	Stop	RT from French Avenue	0.5 veh (3.7m) French Avenue

NOTES: Refer to **Table 4**

As shown the intersections of Chapel Road / Rickard Road, Chapel Road / French Avenue and Jacobs Street / French Avenue all generally retain the same LoS during the AM weekday peak hour, PM weekday peak hour and Sunday network peak hour. The exception to this is the performance of Chapel Road / French Avenue during the peak hour which degrades from an LoS “A” to LoS “B”. An LoS “B” performance is still in the zone of free-flowing traffic with minimal delays and ample capacity.

The SIDRA INTERSECTION 9.1 assessment above indicates that there will be no adverse impact on the existing road network as a result of the proposed development.

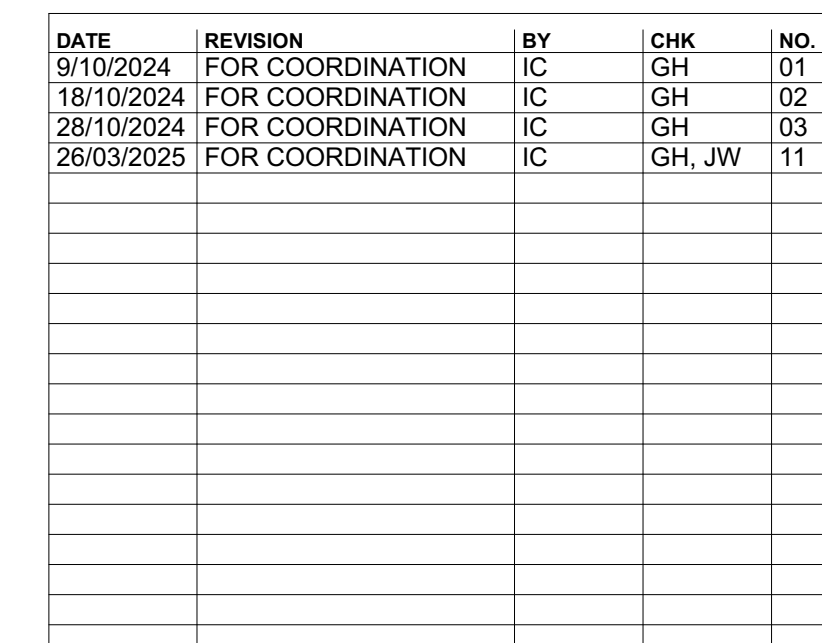
5 CONCLUSIONS

In view of the foregoing, the subject Mixed Use Development proposal at 461 Chapel Road, Bankstown (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts. The following outcomes of this traffic and parking impact assessment are relevant to note:

- a) The proposal includes the provision of **50** car parking spaces within a proposed carpark, comprised of **13** for child care centre/place of worship use, **30** for residential use and seven (**7**) for commercial/retail use. This provision of parking satisfies the CBDCP 2023 parking policy for residential use, child care centre use and commercial/retail use. A parking demand study for the place of worship is detailed in **Section 3.2**.
- b) CBDCP 2023 requires the provision of **93** bicycle parking spaces. The proposed plans detail the provision of **94** bicycle parking spaces, satisfying CBDCP 2023 bicycle parking policy.
- c) CBDCP 2023 does not require the provision motorcycle parking facilities. As such nil (**0**) motorcycle parking spaces have been provided.
- d) The parking areas of the site have been assessed against the relevant sections of AS2890.1:2004, AS2890.2:2018, AS2890.3:2015 and AS2890.6:2022 and have been found to satisfy the objectives of each standard with any acceptable variances outlined in **Section 3.6**. Swept path testing has been undertaken, and the results are reproduced within **Annexure F**.
- e) The traffic generation of the proposed development has been estimated to be some **59** trips in the AM weekday peak period (35 in, 24 out), **58** trips in the PM peak weekday period (23 in, 35 out) and **36** trips (11 in, 25 out) during the Sunday network peak hour period. The impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.1, indicating that there will be no adverse impact to the performance of the intersections as a result of the generated traffic.
- f) It is noted as part of the SEARs a Construction Traffic Management Plan (CTMP) is required. The CTMP will be produced as a separate document associated with the application.



**ANNEXURE A: PROPOSED PLANS
(3 SHEETS)**



PROJECT
461 CHAPEL ROAD, BANKSTOWN
SYDNEY NSW 2200 AUSTRALIA

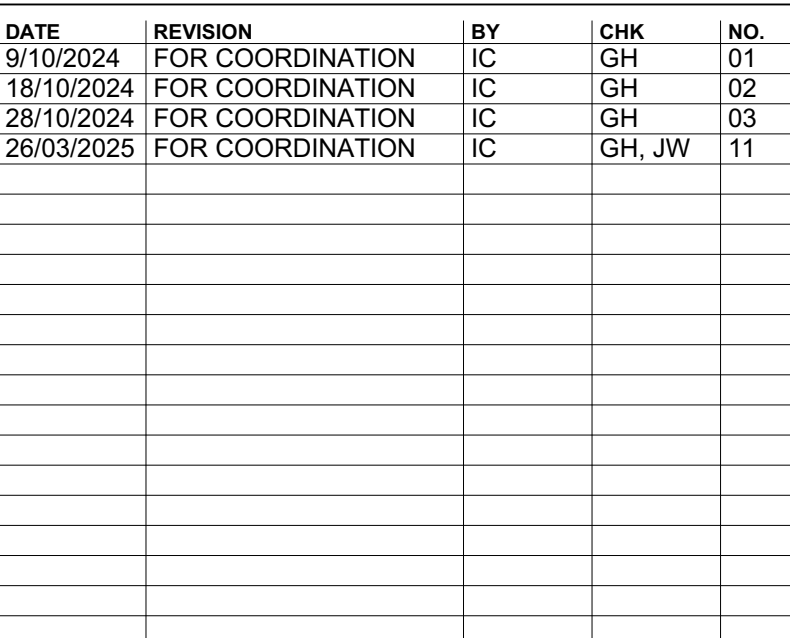
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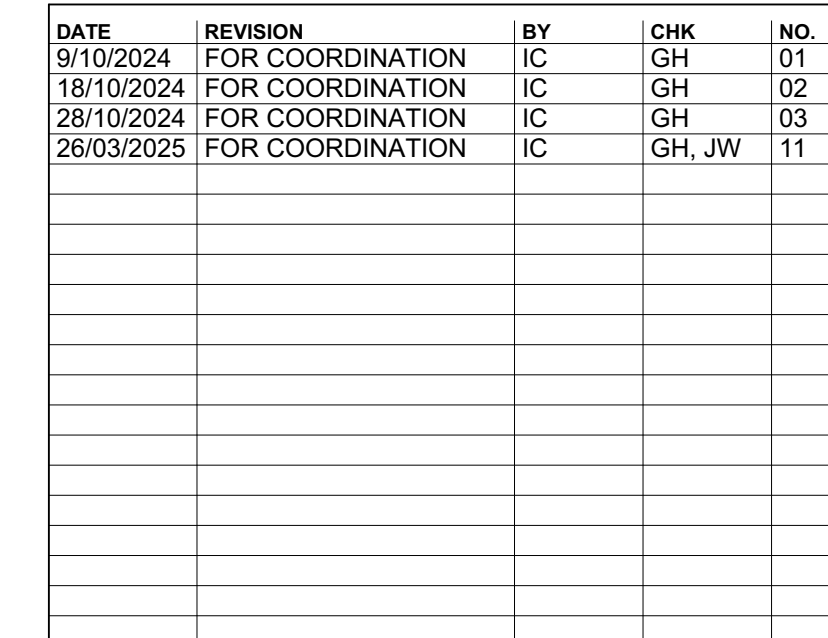
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LA-DA-1000
REVISION
11

CHAPTER ROAD



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Plus Architecture Sydney Pty Ltd
ACN ACN 602107899

PROJECT
461 CHAPEL ROAD, BANKSTOWN
SYDNEY NSW 2200 AUSTRALIA

NOT FOR CONSTRUCTION

FOR COORDINATION

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The Builder/Contractor shall verify all dimensions prior to any work commencing. Future dimensions shall take measurements from existing level.

DRG. NO.
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**ANNEXURE B: TRAFFIC AND PARKING SURVEY DATA
(8 SHEETS)**

TRANS TRAFFIC SURVEY

TURNING MOVEMENT SURVEY



Intersection of Rickard Rd and Chapel Rd, Bankstown

GPS -33.914492, 151.034341

Date:	Thu 14/11/24
Weather:	Overcast
Suburban:	Bankstown
Customer:	McLaren

North:	Chapel Rd
East:	Rickard Rd
South:	Chapel Rd
West:	Rickard Rd

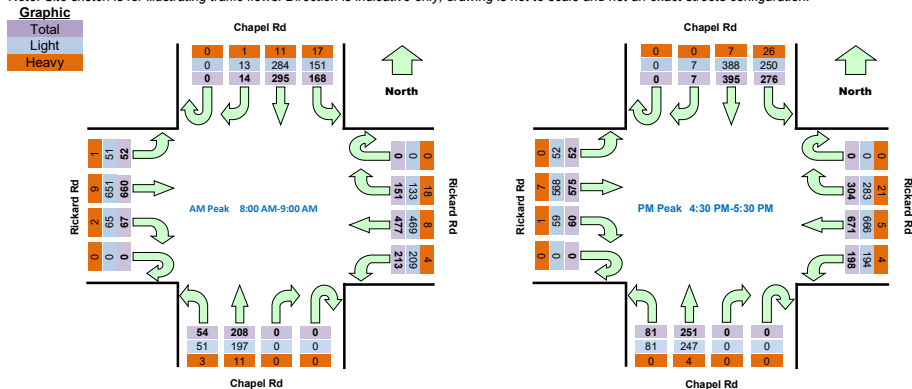
Survey Period	AM: 7:00 AM-9:00 AM
PM: 2:30 PM-6:00 PM	
Traffic Peak	AM: 8:00 AM-9:00 AM
PM: 4:30 PM-5:30 PM	

All Vehicles

Time		North Approach Chapel Rd				East Approach Rickard Rd				South Approach Chapel Rd				West Approach Rickard Rd				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	0	42	22	0	37	55	22	0	0	34	3	0	10	78	14	1538	
7:15	7:30	0	0	50	32	0	37	63	28	0	0	46	7	0	7	90	8	1774	
7:30	7:45	0	1	53	27	0	35	61	24	0	1	31	8	0	19	113	8	1967	
7:45	8:00	0	1	55	51	0	28	76	26	0	2	54	9	0	17	142	11	2172	
8:00	8:15	0	4	71	28	0	39	83	43	0	0	77	6	0	16	173	13	2359	Peak
8:15	8:30	0	3	90	37	0	40	99	46	0	0	57	16	0	12	147	14		
8:30	8:45	0	1	66	51	0	30	140	56	0	0	38	11	0	16	166	11		
8:45	9:00	0	6	68	52	0	42	155	68	0	0	36	21	0	23	174	14		
14:30	14:45	0	2	89	54	0	67	149	38	0	1	46	13	0	15	148	13	2592	
14:45	15:00	0	5	71	52	0	56	165	52	0	0	41	15	0	15	141	18	2621	
15:00	15:15	0	4	104	57	0	43	189	42	0	0	46	15	0	13	121	10	2673	
15:15	15:30	0	1	98	64	0	62	161	47	0	0	52	22	0	10	148	17	2649	
15:30	15:45	0	2	103	65	0	34	184	38	0	0	58	18	0	19	132	11	2635	
15:45	16:00	0	3	83	59	0	69	196	48	0	0	52	12	0	21	122	18	2684	
16:00	16:15	0	1	94	50	0	63	175	52	0	0	45	20	0	17	89	14	2679	
16:15	16:30	0	11	87	62	0	67	165	42	0	0	52	18	0	13	137	14	2796	
16:30	16:45	0	2	112	69	0	71	165	46	0	0	59	22	0	16	140	11	2870	Peak
16:45	17:00	0	3	87	63	0	73	160	45	0	0	47	17	0	18	147	18	2810	
17:00	17:15	0	2	98	76	0	93	166	59	0	0	69	23	0	13	125	13	2729	
17:15	17:30	0	0	98	68	0	67	180	48	0	0	76	19	0	13	163	10		
17:30	17:45	0	3	80	72	0	61	145	49	0	0	46	25	0	10	149	13		
17:45	18:00	1	0	75	66	0	54	156	43	0	0	31	12	0	16	136	7		

Peak Time		North Approach Chapel Rd				East Approach Rickard Rd				South Approach Chapel Rd				West Approach Rickard Rd				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	14	295	168	0	151	477	213	0	0	208	54	0	67	660	52	2359
16:30	17:30	0	7	395	276	0	304	671	198	0	0	251	81	0	60	575	52	2870

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



Intersection of French Ave and Chapel Rd, Bankstown

GPS -33.913201, 151.034854

Date:	Thu 14/11/24
Weather:	Overcast
Suburban:	Bankstown
Customer:	McLaren

North:	Chapel Rd
East:	French Ave
South:	Chapel Rd
West:	French Ave

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

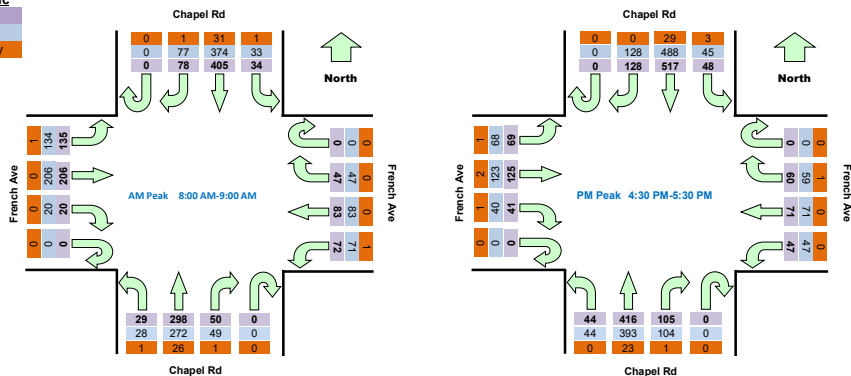
All Vehicles

Time		North Approach Chapel Rd				East Approach French Ave				South Approach Chapel Rd				West Approach French Ave				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	2	48	1	0	5	5	6	0	6	83	2	0	1	10	3	870	
7:15	7:30	0	11	70	2	0	7	3	3	0	5	85	1	0	1	6	5	1069	
7:30	7:45	0	9	76	5	0	10	9	6	0	0	73	2	0	1	15	11	1262	
7:45	8:00	0	9	79	6	0	10	8	16	0	7	79	4	0	5	32	27	1390	
8:00	8:15	0	11	94	3	0	15	13	13	0	10	105	7	0	4	45	51	1457	Peak
8:15	8:30	0	19	107	9	0	5	19	19	0	16	78	9	0	2	67	42		
8:30	8:45	0	22	103	11	0	10	23	20	0	14	57	7	0	4	47	27		
8:45	9:00	0	26	101	11	0	17	28	20	0	10	58	6	0	10	47	15		
14:30	14:45	0	15	105	12	0	8	20	13	0	24	92	7	0	14	37	27	1495	
14:45	15:00	0	26	87	15	0	5	10	12	0	29	72	10	0	19	47	21	1497	
15:00	15:15	0	25	126	11	0	12	18	22	0	22	77	8	0	9	42	12	1539	
15:15	15:30	0	32	132	8	0	4	16	11	0	23	92	9	0	7	35	15	1578	
15:30	15:45	0	17	126	11	0	16	19	13	0	25	71	9	0	8	46	15	1604	
15:45	16:00	0	23	131	9	0	16	23	7	0	22	94	12	0	9	33	16	1622	
16:00	16:15	0	37	133	9	0	22	18	10	0	22	82	14	0	10	46	20	1629	
16:15	16:30	0	40	115	17	0	15	12	12	0	22	95	9	0	5	52	16	1654	
16:30	16:45	0	35	133	14	0	6	15	9	0	22	102	12	0	9	25	12	1671	Peak
16:45	17:00	0	34	118	9	0	16	17	13	0	19	90	11	0	12	39	24	1669	
17:00	17:15	0	25	139	6	0	18	23	13	0	30	120	14	0	9	34	17	1598	
17:15	17:30	0	34	127	19	0	20	16	12	0	34	104	7	0	11	27	16		
17:30	17:45	0	28	142	20	0	13	20	11	0	22	73	18	0	8	29	8		
17:45	18:00	0	18	113	21	0	12	9	10	0	18	70	11	0	7	24	18		

Peak Time		North Approach Chapel Rd				East Approach French Ave				South Approach Chapel Rd				West Approach French Ave				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	78	405	34	0	47	83	72	0	50	298	29	0	20	206	135	1457	
16:30	17:30	0	128	517	48	0	60	71	47	0	105	416	44	0	41	125	69	1671	

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 French Ave and Jacobs St, Bankstown

GPS -33.913531, 151.037080

Date:	Thu 14/11/24
Weather:	Overcast
Suburban:	Bankstown
Customer:	McLaren

North:	Jacobs St
East:	N/A
South:	Jacobs St
West:	French Ave

Survey Period	AM: 7:00 AM-9:00 AM
	PM: 2:30 PM-6:00 PM
Traffic Peak	AM: 8:00 AM-9:00 AM
	PM: 3:45 PM-4:45 PM

All Vehicles

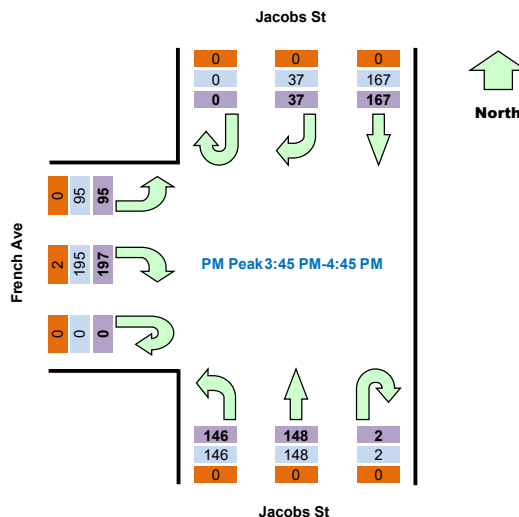
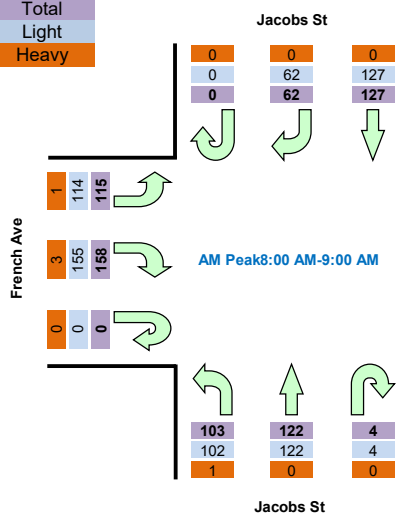
Time		North Approach Jacobs St			South Approach Jacobs St			West Approach French Ave			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
7:00	7:15	0	4	8	1	8	7	0	11	7	278	
7:15	7:30	0	2	14	0	9	16	0	8	5	369	
7:30	7:45	0	6	11	0	8	12	0	14	12	489	
7:45	8:00	0	6	26	0	11	22	0	24	26	610	
8:00	8:15	0	12	21	0	33	19	0	31	21	691	Peak
8:15	8:30	0	10	30	0	34	24	0	41	35		
8:30	8:45	0	19	32	3	26	28	0	46	30		
8:45	9:00	0	21	44	1	29	32	0	40	29		
14:30	14:45	0	12	44	1	37	34	1	36	24	726	
14:45	15:00	0	4	27	1	31	24	0	67	22	729	
15:00	15:15	0	9	56	0	40	28	0	38	15	734	
15:15	15:30	0	8	51	1	33	21	0	35	26	780	
15:30	15:45	0	22	39	0	38	22	0	45	26	791	
15:45	16:00	0	12	35	0	30	39	0	48	17	792	Peak
16:00	16:15	0	15	54	0	43	44	0	54	22	786	
16:15	16:30	0	2	34	0	35	32	0	52	31	787	
16:30	16:45	0	8	44	2	40	31	0	43	25	789	
16:45	17:00	0	12	35	0	30	38	0	45	15	774	
17:00	17:15	0	16	55	0	44	45	0	46	27	740	
17:15	17:30	0	14	33	0	40	31	0	49	21		
17:30	17:45	0	15	33	0	30	33	0	47	20		
17:45	18:00	0	8	24	0	29	32	0	30	18		

Peak Time		North Approach Jacobs St			South Approach Jacobs St			West Approach French Ave			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	
8:00	9:00	0	62	127	4	122	103	0	158	115	691
15:45	16:45	0	37	167	2	148	146	0	197	95	792

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



Intersection of Rickard Rd and Chapel Rd, Bankstown

GPS -33.914492, 151.034341

Date: Sun 17/11/24
Weather: Overcast
Suburban: Bankstown
Customer: McLaren

North: Chapel Rd
East: Rickard Rd
South: Chapel Rd
West: Rickard Rd

Survey Period
AM: 7:00 AM-9:00 AM
PM: 2:30 PM-6:00 PM
Traffic Peak
AM: 8:00 AM-9:00 AM
PM: 2:45 PM-3:45 PM

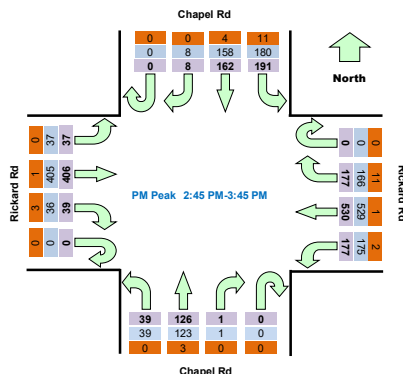
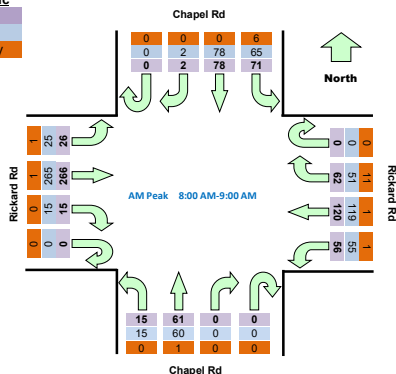
All Vehicles

Time		North Approach Chapel Rd				East Approach Rickard Rd				South Approach Chapel Rd				West Approach Rickard Rd				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	0	11	9	0	5	12	7	0	0	7	2	0	2	28	3	410	
7:15	7:30	0	0	8	6	0	6	14	6	0	0	7	1	0	1	24	3	485	
7:30	7:45	0	0	14	8	0	8	8	14	0	0	9	4	0	3	27	2	549	
7:45	8:00	0	0	20	23	0	11	14	8	0	0	21	2	0	0	45	7	650	
8:00	8:15	0	0	14	15	0	15	24	12	0	0	13	2	0	4	52	10	772	Peak
8:15	8:30	0	0	18	8	0	14	19	8	0	0	14	1	0	1	55	2		
8:30	8:45	0	1	23	18	0	13	36	14	0	0	13	3	0	5	66	6		
8:45	9:00	0	1	23	30	0	20	41	22	0	0	21	9	0	5	93	8		
14:30	14:45	0	0	49	42	0	46	117	42	0	2	35	16	0	11	100	10	1886	
14:45	15:00	0	1	48	54	0	45	141	51	0	0	34	14	0	7	107	8	1893	Peak
15:00	15:15	0	2	43	48	0	45	139	35	0	1	32	5	0	12	111	10	1865	
15:15	15:30	0	3	31	40	0	37	116	48	0	0	27	9	0	10	93	9	1814	
15:30	15:45	0	2	40	49	0	50	134	43	0	0	33	11	0	10	95	10	1830	
15:45	16:00	0	1	42	35	0	44	139	43	0	2	37	12	0	8	107	12	1827	
16:00	16:15	0	1	44	19	0	49	142	42	0	0	20	6	0	4	95	10	1772	
16:15	16:30	0	0	42	34	0	61	122	37	0	4	41	11	0	10	65	12	1802	
16:30	16:45	0	0	34	38	0	53	143	51	0	0	46	12	0	6	83	8	1759	
16:45	17:00	0	0	47	27	0	48	115	49	0	1	30	9	0	7	83	11	1702	
17:00	17:15	0	0	50	43	0	62	106	43	0	0	28	16	0	6	89	19	1750	
17:15	17:30	0	0	44	30	0	37	111	52	0	1	19	5	0	6	83	8		
17:30	17:45	0	1	40	35	0	42	102	35	0	0	34	13	0	3	102	10		
17:45	18:00	0	2	48	38	0	43	101	55	0	0	53	15	0	10	94	16		

Peak Time		North Approach Chapel Rd				East Approach Rickard Rd				South Approach Chapel Rd				West Approach Rickard Rd				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	2	78	71	0	62	120	56	0	0	61	15	0	15	266	26	772	
14:45	15:45	0	8	162	191	0	177	530	177	0	1	126	39	0	39	406	37	1893	

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Graphic
Total
Light
Heavy



Intersection of French Ave and Chapel Rd, Bankstown

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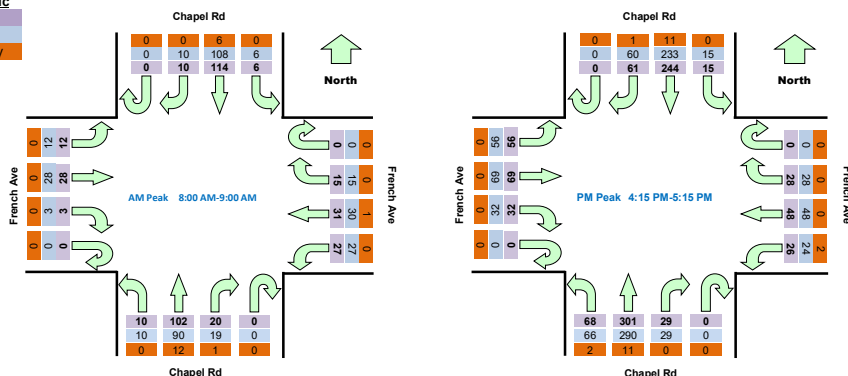
All Vehicles

Time	North Approach Chapel Rd	East Approach French Ave	South Approach Chapel Rd	West Approach French Ave	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 0 13 1	0 2 1 5	0 4 10 2	0 0 0 0	211
7:15 7:30	0 1 12 0	0 1 1 1	0 2 11 1	0 0 4 1	259
7:30 7:45	0 1 20 1	0 4 3 4	0 2 15 1	0 1 1 1	291
7:45 8:00	0 2 27 3	0 3 3 10	0 3 31 1	0 1 0 0	329
8:00 8:15	0 1 23 3	0 4 6 7	0 2 30 3	0 0 4 3	378 Peak
8:15 8:30	0 0 23 0	0 4 3 5	0 3 21 1	0 1 4 2	
8:30 8:45	0 3 30 2	0 2 10 8	0 5 18 1	0 0 8 5	
8:45 9:00	0 6 38 1	0 5 12 7	0 10 33 5	0 2 12 2	
14:30 14:45	0 10 81 1	0 4 8 4	0 13 61 9	0 7 13 16	876
14:45 15:00	0 12 79 4	0 5 4 7	0 13 61 8	0 15 11 9	863
15:00 15:15	0 11 72 6	0 7 6 5	0 10 64 5	0 6 19 12	852
15:15 15:30	0 8 55 13	0 7 10 5	0 8 49 7	0 7 20 9	810
15:30 15:45	0 10 66 5	0 14 10 6	0 10 56 12	0 12 10 3	873
15:45 16:00	0 6 66 7	0 8 5 13	0 10 67 12	0 5 13 5	914
16:00 16:15	0 7 64 2	0 9 8 6	0 10 47 13	0 5 4 6	926
16:15 16:30	0 16 69 1	0 7 6 3	0 11 86 19	0 7 17 19	977 Peak
16:30 16:45	0 15 47 3	0 8 18 7	0 7 80 15	0 11 27 17	928
16:45 17:00	0 14 62 10	0 7 12 8	0 7 61 13	0 5 16 14	896
17:00 17:15	0 16 66 1	0 6 12 8	0 4 74 21	0 9 9 6	961
17:15 17:30	1 18 57 8	0 11 10 3	0 11 49 7	0 5 18 14	
17:30 17:45	0 15 59 10	0 6 11 9	0 6 56 15	0 9 19 8	
17:45 18:00	0 18 74 11	0 9 13 7	0 16 74 18	0 10 25 19	

Peak Time	North Approach Chapel Rd	East Approach French Ave	South Approach Chapel Rd	West Approach French Ave	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 10 114 6	0 15 31 27	0 20 102 10	0 3 28 12	378
16:15 17:15	0 61 244 15	0 28 48 26	0 29 301 68	0 32 69 56	977

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Heavy



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trafficsurvey.com.au



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All Vehicles

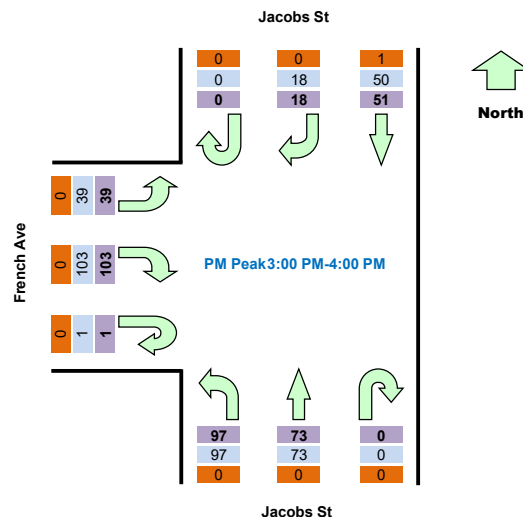
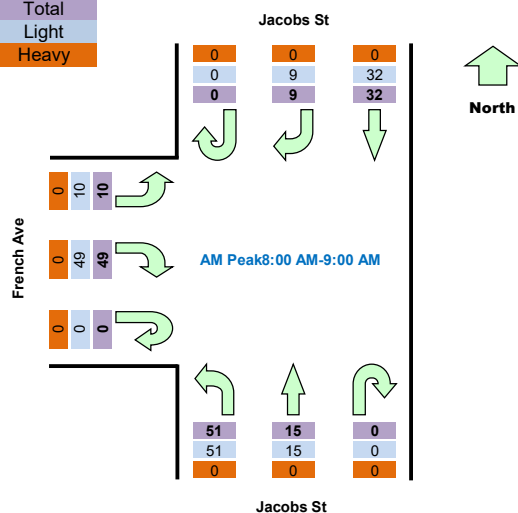
Time		North Approach Jacobs St			South Approach Jacobs St			West Approach French Ave			Hourly Total	
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	Hour	Peak
7:00	7:15	0	3	6	0	1	3	0	6	2	95	
7:15	7:30	0	0	1	0	2	1	0	4	3	108	
7:30	7:45	0	2	9	0	0	6	0	9	1	130	
7:45	8:00	0	3	4	4	3	8	0	10	4	147	
8:00	8:15	0	1	8	0	3	10	0	10	2	166	Peak
8:15	8:30	0	0	8	0	5	10	0	8	2		
8:30	8:45	0	2	6	0	1	19	0	13	3		
8:45	9:00	0	6	10	0	6	12	0	18	3		
14:30	14:45	0	6	23	0	14	15	1	19	11	347	
14:45	15:00	0	2	19	1	15	18	0	16	5	356	
15:00	15:15	0	0	8	0	18	16	1	37	8	382	Peak
15:15	15:30	0	5	17	0	15	24	0	25	8	358	
15:30	15:45	0	9	10	0	20	26	0	23	10	366	
15:45	16:00	0	4	16	0	20	31	0	18	13	377	
16:00	16:15	0	6	6	0	11	15	0	16	10	360	
16:15	16:30	0	3	10	0	24	29	0	28	8	360	
16:30	16:45	0	8	15	0	23	26	0	30	7	355	
16:45	17:00	0	7	10	0	16	22	0	18	12	335	
17:00	17:15	0	5	10	0	11	20	0	13	5	364	
17:15	17:30	0	3	10	1	27	22	0	26	8		
17:30	17:45	0	4	15	2	12	23	0	23	10		
17:45	18:00	0	5	25	2	15	24	0	30	13		

Peak Time		North Approach Jacobs St			South Approach Jacobs St			West Approach French Ave			Peak total
Period Start	Period End	U	R	SB	U	NB	L	U	R	L	
8:00	9:00	0	9	32	0	15	51	0	49	10	166
15:00	16:00	0	18	51	0	73	97	1	103	39	382

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



[illegible]

[illegible]



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

MOVEMENT SUMMARY

 **Site: 1 [(ExAM) Chapel Road / Rickard Road (Site Folder: Existing)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing AM Peak Hour Period
Chapel Road / Rickard Road
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 68 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
			veh/h		veh/h		v/c	sec							km/h
South: Chapel Road (S)															
1	L2	All MCs	57	5.6	57	5.6	0.159	18.6	LOS B	2.3	16.9	0.72	0.67	0.72	18.7
2	T1	All MCs	219	5.3	219	5.3	0.302	20.0	LOS B	4.5	33.1	0.79	0.66	0.79	27.7
Approach			276	5.3	276	5.3	0.302	19.7	LOS B	4.5	33.1	0.77	0.66	0.77	25.6
East: Rickard Road (E)															
4	L2	All MCs	224	1.9	224	1.9	0.449	21.5	LOS B	8.5	60.4	0.76	0.74	0.76	29.6
5	T1	All MCs	502	1.7	502	1.7	0.449	15.0	LOS B	8.8	62.2	0.76	0.67	0.76	31.7
6	R2	All MCs	159	11.9	159	11.9	* 0.386	17.6	LOS B	3.0	23.3	0.80	0.76	0.80	30.0
Approach			885	3.6	885	3.6	0.449	17.1	LOS B	8.8	62.2	0.76	0.71	0.76	30.8
North: Chapel Road (N)															
7	L2	All MCs	177	10.1	177	10.1	0.193	14.7	LOS B	3.1	23.4	0.56	0.72	0.56	31.8
8	T1	All MCs	324	3.6	324	3.6	* 0.556	21.6	LOS B	9.2	66.6	0.89	0.75	0.89	26.3
9	R2	All MCs	1	100.0	1	100.0	0.556	32.1	LOS C	9.2	66.6	0.89	0.75	0.89	17.2
Approach			502	6.1	502	6.1	0.556	19.2	LOS B	9.2	66.6	0.77	0.74	0.77	28.2
West: Rickard Road (W)															
10	L2	All MCs	55	1.9	55	1.9	0.598	25.6	LOS B	11.2	79.4	0.87	0.76	0.87	22.2
11	T1	All MCs	695	1.4	695	1.4	* 0.598	23.3	LOS B	11.2	79.4	0.87	0.75	0.87	28.2
12	R2	All MCs	71	3.0	71	3.0	0.189	23.4	LOS B	1.3	9.5	0.71	0.71	0.71	24.9
Approach			820	1.5	820	1.5	0.598	23.4	LOS B	11.2	79.4	0.86	0.75	0.86	25.1
All Vehicles			2483	3.6	2483	3.6	0.598	19.9	LOS B	11.2	79.4	0.80	0.72	0.80	27.7

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

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Project: Z:\Jobs\2024\240874\MTE SIDRA\25 01 24 - DA SIDRAs SI\25 01 24 - SI.sip9

MOVEMENT SUMMARY

 **Site: 2 [(ExAM) Chapel Road / French Avenue (Site Folder: Existing)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing AM Peak Hour Period
Chapel Road / French Avenue
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 51 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
South: Chapel Road (S)															
1	L2	All MCs	31	3.4	31	3.4	0.341	12.8	LOS A	4.8	36.1	0.59	0.53	0.59	40.8
2	T1	All MCs	314	8.7	314	8.7	0.341	7.2	LOS A	4.8	36.1	0.59	0.53	0.59	41.8
3	R2	All MCs	53	2.0	53	2.0	0.125	16.8	LOS B	0.9	6.2	0.67	0.71	0.67	30.7
Approach			397	7.4	397	7.4	0.341	8.9	LOS A	4.8	36.1	0.60	0.55	0.60	39.4
East: French Avenue (E)															
4	L2	All MCs	76	1.4	76	1.4	0.191	24.0	LOS B	1.6	11.4	0.85	0.74	0.85	26.0
5	T1	All MCs	87	0.0	87	0.0	0.486	20.1	LOS B	3.3	23.1	0.95	0.77	0.95	31.5
6	R2	All MCs	49	0.0	49	0.0	0.486	30.8	LOS C	3.3	23.1	0.95	0.77	0.95	26.6
Approach			213	0.5	213	0.5	0.486	24.0	LOS B	3.3	23.1	0.91	0.76	0.91	28.5
North: Chapel Road (N)															
7	L2	All MCs	36	2.9	36	2.9	0.474	14.2	LOS A	7.1	52.9	0.65	0.59	0.65	39.3
8	T1	All MCs	426	7.7	426	7.7	* 0.474	8.7	LOS A	7.1	52.9	0.65	0.59	0.65	40.8
9	R2	All MCs	82	1.3	82	1.3	0.158	15.8	LOS B	1.2	8.8	0.62	0.71	0.62	34.1
Approach			544	6.4	544	6.4	0.474	10.1	LOS A	7.1	52.9	0.65	0.60	0.65	37.8
West: French Avenue (W)															
10	L2	All MCs	142	0.7	142	0.7	0.357	24.9	LOS B	3.2	22.2	0.89	0.77	0.89	27.4
11	T1	All MCs	217	0.0	217	0.0	0.615	20.6	LOS B	5.7	40.2	0.95	0.81	1.00	33.2
12	R2	All MCs	21	0.0	21	0.0	* 0.615	30.4	LOS C	5.7	40.2	0.95	0.81	1.00	29.0
Approach			380	0.3	380	0.3	0.615	22.7	LOS B	5.7	40.2	0.93	0.80	0.96	30.7
All Vehicles			1534	4.3	1534	4.3	0.615	14.8	LOS B	7.1	52.9	0.74	0.66	0.75	34.0

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY



Site: 3 [(ExAM) French Avenue / Jacobs Street (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing AM Peak Hour Period
French Avenue / Jacobs Street
Job No. 240874
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
South: Jacobs Street (S)															
1	L2	All MCs	108	1.0	108	1.0	0.125	5.6	LOS A	0.0	0.0	0.00	0.27	0.00	47.3
2	T1	All MCs	128	0.0	128	0.0	0.125	0.0	LOS A	0.0	0.0	0.00	0.27	0.00	56.2
Approach			237	0.4	237	0.4	0.125	2.5	NA	0.0	0.0	0.00	0.27	0.00	53.2
North: Jacobs Street (N)															
8	T1	All MCs	134	0.0	134	0.0	0.115	0.4	LOS A	0.4	3.0	0.24	0.28	0.24	55.9
9	R2	All MCs	65	0.0	65	0.0	0.115	6.3	LOS A	0.4	3.0	0.24	0.28	0.24	52.8
Approach			199	0.0	199	0.0	0.115	2.3	NA	0.4	3.0	0.24	0.28	0.24	54.8
West: French Avenue (W)															
10	L2	All MCs	121	0.9	121	0.9	0.309	8.7	LOS A	1.3	9.5	0.39	0.87	0.39	47.3
12	R2	All MCs	166	1.9	166	1.9	0.309	10.2	LOS A	1.3	9.5	0.39	0.87	0.39	37.4
Approach			287	1.5	287	1.5	0.309	9.6	LOS A	1.3	9.5	0.39	0.87	0.39	42.9
All Vehicles			723	0.7	723	0.7	0.309	5.3	NA	1.3	9.5	0.22	0.51	0.22	49.4

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

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

 **Site: 1 [(ExPM) Chapel Road / Rickard Road (Site Folder: Existing)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing PM Peak Hour Period
Chapel Road / Rickard Road
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 108 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Chapel Road (S)															
1	L2	All MCs	85	0.0	85	0.0	0.241	40.9	LOS C	5.5	38.9	0.78	0.72	0.78	14.4
2	T1	All MCs	264	1.6	264	1.6	0.457	43.6	LOS D	9.0	63.8	0.85	0.72	0.85	19.9
Approach			349	1.2	349	1.2	0.457	43.0	LOS D	9.0	63.8	0.83	0.72	0.83	15.7
East: Rickard Road (E)															
4	L2	All MCs	208	2.0	208	2.0	0.445	22.9	LOS B	14.3	101.1	0.65	0.67	0.65	29.5
5	T1	All MCs	706	0.7	706	0.7	0.445	16.2	LOS B	14.7	103.3	0.65	0.61	0.65	30.7
6	R2	All MCs	320	6.9	320	6.9	* 0.586	21.1	LOS B	8.4	62.1	0.85	0.82	0.85	27.8
Approach			1235	2.6	1235	2.6	0.586	18.6	LOS B	14.7	103.3	0.70	0.67	0.70	29.6
North: Chapel Road (N)															
7	L2	All MCs	291	9.4	291	9.4	0.300	19.3	LOS B	8.1	61.0	0.57	0.74	0.57	28.5
8	T1	All MCs	423	1.7	423	1.7	0.771	40.1	LOS C	21.3	152.0	0.98	0.89	1.03	17.7
9	R2	All MCs	1 100.0		1 100.0		* 0.771	58.5	LOS E	21.3	152.0	0.98	0.89	1.03	12.4
Approach			715	5.0	715	5.0	0.771	31.7	LOS C	21.3	152.0	0.81	0.83	0.84	21.4
West: Rickard Road (W)															
10	L2	All MCs	55	0.0	55	0.0	0.577	37.6	LOS C	16.4	116.0	0.88	0.77	0.88	16.9
11	T1	All MCs	605	1.2	605	1.2	* 0.577	38.2	LOS C	16.4	116.0	0.87	0.76	0.87	21.6
12	R2	All MCs	63	1.7	63	1.7	0.217	34.2	LOS C	1.5	10.9	0.69	0.71	0.69	22.9
Approach			723	1.2	723	1.2	0.577	37.8	LOS C	16.4	116.0	0.86	0.75	0.86	18.6
All Vehicles			3022	2.6	3022	2.6	0.771	29.1	LOS C	21.3	152.0	0.78	0.74	0.79	22.5

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 Site: 2 [(ExPM) Chapel Road / French Avenue (Site Folder: Existing)]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing PM Peak Hour Period
Chapel Road / French Avenue
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 84 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
			veh/h		veh/h		v/c	sec							km/h
South: Chapel Road (S)															
1	L2	All MCs	46	0.0	46	0.0	0.386	8.1	LOS A	3.9	28.1	0.21	0.23	0.21	48.2
2	T1	All MCs	438	5.5	438	5.5	0.386	2.5	LOS A	3.9	28.1	0.21	0.23	0.21	51.3
3	R2	All MCs	111	1.0	111	1.0	0.235	13.9	LOS A	2.1	15.0	0.49	0.70	0.49	33.1
Approach			595	4.2	595	4.2	0.386	5.0	LOS A	3.9	28.1	0.26	0.32	0.26	45.8
East: French Avenue (E)															
4	L2	All MCs	49	0.0	49	0.0	0.140	36.7	LOS C	1.7	12.0	0.87	0.73	0.87	20.6
5	T1	All MCs	75	0.0	75	0.0	0.693	37.5	LOS C	5.9	41.6	1.00	0.86	1.13	22.6
6	R2	All MCs	63	1.7	63	1.7	* 0.693	51.8	LOS D	5.9	41.6	1.00	0.86	1.13	18.7
Approach			187	0.6	187	0.6	0.693	42.1	LOS C	5.9	41.6	0.96	0.83	1.06	20.8
North: Chapel Road (N)															
7	L2	All MCs	51	6.3	51	6.3	0.477	8.0	LOS A	5.3	38.7	0.24	0.25	0.24	46.3
8	T1	All MCs	544	5.6	544	5.6	* 0.477	2.5	LOS A	5.3	38.7	0.24	0.25	0.24	51.4
9	R2	All MCs	135	0.0	135	0.0	0.241	13.4	LOS A	2.5	17.6	0.48	0.70	0.48	35.5
Approach			729	4.6	729	4.6	0.477	4.9	LOS A	5.3	38.7	0.28	0.33	0.28	46.2
West: French Avenue (W)															
10	L2	All MCs	73	1.4	73	1.4	0.207	37.3	LOS C	2.6	18.2	0.88	0.75	0.88	22.0
11	T1	All MCs	132	1.6	132	1.6	0.681	36.8	LOS C	7.3	51.7	1.00	0.86	1.08	23.8
12	R2	All MCs	43	2.4	43	2.4	0.681	51.2	LOS D	7.3	51.7	1.00	0.86	1.08	20.6
Approach			247	1.7	247	1.7	0.681	39.4	LOS C	7.3	51.7	0.96	0.82	1.02	22.7
All Vehicles			1759	3.7	1759	3.7	0.693	13.8	LOS A	7.3	51.7	0.44	0.45	0.46	34.6

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: 3 [(ExPM) French Avenue / Jacobs Street (Site Folder: Existing)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing PM Peak Hour Period
French Avenue / Jacobs Street
Job No. 240874
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh]	[Dist] m				
South: Jacobs Street (S)															
1	L2	All MCs	156	0.0	156	0.0	0.164	5.5	LOS A	0.0	0.0	0.00	0.30	0.00	47.0
2	T1	All MCs	156	0.0	156	0.0	0.164	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	55.9
Approach			312	0.0	312	0.0	0.164	2.8	NA	0.0	0.0	0.00	0.30	0.00	52.5
North: Jacobs Street (N)															
8	T1	All MCs	176	0.0	176	0.0	0.120	0.3	LOS A	0.3	2.1	0.17	0.20	0.17	57.4
9	R2	All MCs	39	0.0	39	0.0	0.120	6.6	LOS A	0.3	2.1	0.17	0.20	0.17	54.0
Approach			215	0.0	215	0.0	0.120	1.5	NA	0.3	2.1	0.17	0.20	0.17	56.7
West: French Avenue (W)															
10	L2	All MCs	100	0.0	100	0.0	0.367	9.1	LOS A	1.8	12.9	0.48	0.90	0.53	46.6
12	R2	All MCs	207	1.0	207	1.0	0.367	11.1	LOS A	1.8	12.9	0.48	0.90	0.53	36.5
Approach			307	0.7	307	0.7	0.367	10.5	LOS A	1.8	12.9	0.48	0.90	0.53	41.1
All Vehicles			834	0.3	834	0.3	0.367	5.3	NA	1.8	12.9	0.22	0.49	0.24	49.2

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

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

 **Site: 1 [(Ex)Sunday] Chapel Road / Rickard Road (Site Folder: Existing)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing Sunday Network Peak Hour Period
Chapel Road / Rickard Road
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 74 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows [Total HV] veh/h %		Arrival Flows [Total HV] veh/h %		Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. Dist] veh m		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
South: Chapel Road (S)															
1	L2	All MCs	41	0.0	41	0.0	0.117	23.6	LOS B	1.7	12.1	0.76	0.68	0.76	17.0
2	T1	All MCs	133	2.4	133	2.4	0.221	24.0	LOS B	3.2	22.5	0.82	0.66	0.82	24.9
Approach			174	1.8	174	1.8	0.221	23.9	LOS B	3.2	22.5	0.80	0.66	0.80	22.7
East: Rickard Road (E)															
4	L2	All MCs	186	1.1	186	1.1	0.359	16.4	LOS B	7.5	53.0	0.61	0.65	0.61	34.0
5	T1	All MCs	558	0.2	558	0.2	0.359	10.4	LOS A	7.7	54.3	0.61	0.57	0.61	36.7
6	R2	All MCs	186	6.2	186	6.2	* 0.316	14.6	LOS B	3.3	24.5	0.65	0.73	0.65	32.6
Approach			931	1.6	931	1.6	0.359	12.4	LOS A	7.7	54.3	0.62	0.62	0.62	35.1
North: Chapel Road (N)															
7	L2	All MCs	201	5.8	201	5.8	0.232	17.4	LOS B	4.2	30.9	0.61	0.74	0.61	30.0
8	T1	All MCs	179	2.4	179	2.4	* 0.368	24.8	LOS B	5.4	39.1	0.87	0.71	0.87	24.2
9	R2	All MCs	100.0		100.0		0.368	34.3	LOS C	5.4	39.1	0.87	0.71	0.87	16.1
Approach			381	4.4	381	4.4	0.368	20.9	LOS B	5.4	39.1	0.73	0.72	0.73	27.3
West: Rickard Road (W)															
10	L2	All MCs	39	0.0	39	0.0	0.310	22.5	LOS B	5.9	41.4	0.73	0.64	0.73	24.1
11	T1	All MCs	427	0.2	427	0.2	* 0.310	17.2	LOS B	5.9	41.4	0.73	0.63	0.73	30.5
12	R2	All MCs	41	7.7	41	7.7	0.116	15.5	LOS B	0.8	5.6	0.62	0.67	0.62	25.8
Approach			507	0.8	507	0.8	0.310	17.5	LOS B	5.9	41.4	0.72	0.63	0.72	29.4
All Vehicles			1993	2.0	1993	2.0	0.368	16.4	LOS B	7.7	54.3	0.68	0.64	0.68	30.7

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: 2 [(Ex)Sunday] Chapel Road / French Avenue (Site Folder: Existing)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing Sunday Network Peak Hour Period
Chapel Road / French Avenue
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 44 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
			veh/h		veh/h		v/c	sec							km/h
South: Chapel Road (S)															
1	L2	All MCs	72	2.9	72	2.9	0.362	9.1	LOS A	3.2	22.8	0.40	0.41	0.40	45.0
2	T1	All MCs	317	3.7	317	3.7	* 0.362	3.5	LOS A	3.2	22.8	0.40	0.41	0.40	47.6
3	R2	All MCs	31	0.0	31	0.0	0.046	10.7	LOS A	0.3	2.2	0.49	0.66	0.49	36.3
Approach			419	3.3	419	3.3	0.362	5.0	LOS A	3.2	22.8	0.40	0.43	0.40	45.9
East: French Avenue (E)															
4	L2	All MCs	27	7.7	27	7.7	0.098	23.8	LOS B	0.5	4.0	0.88	0.70	0.88	26.0
5	T1	All MCs	51	0.0	51	0.0	0.307	18.8	LOS B	1.7	11.8	0.92	0.73	0.92	33.4
6	R2	All MCs	31	3.4	31	3.4	0.307	25.3	LOS B	1.7	11.8	0.92	0.73	0.92	28.0
Approach			108	2.9	108	2.9	0.307	21.9	LOS B	1.7	11.8	0.91	0.72	0.91	30.1
North: Chapel Road (N)															
7	L2	All MCs	16	0.0	16	0.0	0.244	8.4	LOS A	1.8	12.8	0.33	0.30	0.33	46.9
8	T1	All MCs	246	4.7	246	4.7	0.244	3.0	LOS A	1.8	12.8	0.33	0.30	0.33	50.5
9	R2	All MCs	64	1.6	64	1.6	0.114	12.1	LOS A	0.8	5.4	0.56	0.69	0.56	36.5
Approach			326	3.9	326	3.9	0.244	5.0	LOS A	1.8	12.8	0.37	0.38	0.37	45.9
West: French Avenue (W)															
10	L2	All MCs	59	0.0	59	0.0	0.200	24.1	LOS B	1.2	8.2	0.90	0.73	0.90	27.9
11	T1	All MCs	73	0.0	73	0.0	* 0.389	19.0	LOS B	2.2	15.5	0.94	0.74	0.94	33.4
12	R2	All MCs	34	0.0	34	0.0	0.389	25.6	LOS B	2.2	15.5	0.94	0.74	0.94	29.2
Approach			165	0.0	165	0.0	0.389	22.1	LOS B	2.2	15.5	0.92	0.74	0.92	30.5
All Vehicles			1019	2.9	1019	2.9	0.389	9.6	LOS A	3.2	22.8	0.53	0.49	0.53	39.4

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: 3 [(ExSunday) French Avenue / Jacobs Street (Site Folder: Existing)]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Existing Sunday Network Peak Hour Period
French Avenue / Jacobs Street
Job No. 240874
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh]	Dist] m				
South: Jacobs Street (S)															
1	L2	All MCs	102	0.0	102	0.0	0.094	5.5	LOS A	0.0	0.0	0.00	0.34	0.00	46.3
2	T1	All MCs	77	0.0	77	0.0	0.094	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	55.4
Approach			179	0.0	179	0.0	0.094	3.2	NA	0.0	0.0	0.00	0.34	0.00	51.3
North: Jacobs Street (N)															
8	T1	All MCs	54	2.0	54	2.0	0.040	0.2	LOS A	0.1	0.8	0.16	0.20	0.16	56.8
9	R2	All MCs	19	0.0	19	0.0	0.040	6.0	LOS A	0.1	0.8	0.16	0.20	0.16	53.5
Approach			73	1.4	73	1.4	0.040	1.7	NA	0.1	0.8	0.16	0.20	0.16	55.9
West: French Avenue (W)															
10	L2	All MCs	41	0.0	41	0.0	0.144	8.3	LOS A	0.5	3.7	0.26	0.89	0.26	48.0
12	R2	All MCs	108	0.0	108	0.0	0.144	8.5	LOS A	0.5	3.7	0.26	0.89	0.26	38.5
Approach			149	0.0	149	0.0	0.144	8.4	LOS A	0.5	3.7	0.26	0.89	0.26	42.3
All Vehicles			401	0.3	401	0.3	0.144	4.9	NA	0.5	3.7	0.12	0.52	0.12	48.8

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

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

 Site: 1 [(FutAM) Chapel Road / Rickard Road (Site Folder: Future (Post Development))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Future AM Peak Hour Period
Chapel Road / Rickard Road
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 68 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh]	[Dist] m				km/h
South: Chapel Road (S)															
1	L2	All MCs	57	5.6	57	5.6	0.163	18.5	LOS B	2.4	17.3	0.72	0.67	0.72	18.8
2	T1	All MCs	226	5.1	226	5.1	0.310	20.0	LOS B	4.7	34.1	0.79	0.66	0.79	27.7
Approach			283	5.2	283	5.2	0.310	19.7	LOS B	4.7	34.1	0.78	0.66	0.78	25.6
East: Rickard Road (E)															
4	L2	All MCs	224	1.9	224	1.9	0.449	21.5	LOS B	8.5	60.4	0.76	0.74	0.76	29.6
5	T1	All MCs	502	1.7	502	1.7	0.449	15.0	LOS B	8.8	62.2	0.76	0.67	0.76	31.7
6	R2	All MCs	159	11.9	159	11.9	* 0.386	17.6	LOS B	3.0	23.3	0.80	0.76	0.80	30.0
Approach			885	3.6	885	3.6	0.449	17.1	LOS B	8.8	62.2	0.76	0.71	0.76	30.8
North: Chapel Road (N)															
7	L2	All MCs	183	9.8	183	9.8	0.199	14.7	LOS B	3.2	24.3	0.56	0.72	0.56	31.8
8	T1	All MCs	329	3.5	329	3.5	* 0.565	21.6	LOS B	9.4	67.9	0.89	0.76	0.89	26.2
9	R2	All MCs	1 100.0		1 100.0		0.565	32.2	LOS C	9.4	67.9	0.89	0.76	0.89	17.2
Approach			514	5.9	514	5.9	0.565	19.2	LOS B	9.4	67.9	0.77	0.74	0.77	28.2
West: Rickard Road (W)															
10	L2	All MCs	57	1.9	57	1.9	0.599	25.6	LOS B	11.2	79.7	0.88	0.77	0.88	22.2
11	T1	All MCs	695	1.4	695	1.4	* 0.599	23.3	LOS B	11.2	79.7	0.87	0.76	0.87	28.2
12	R2	All MCs	71	3.0	71	3.0	0.189	23.4	LOS B	1.3	9.5	0.71	0.71	0.71	24.9
Approach			822	1.5	822	1.5	0.599	23.5	LOS B	11.2	79.7	0.86	0.75	0.86	25.1
All Vehicles			2504	3.6	2504	3.6	0.599	19.9	LOS B	11.2	79.7	0.80	0.72	0.80	27.7

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: 2 [(FutAM) Chapel Road / French Avenue (Site Folder: Future (Post Development))]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Future AM Peak Hour Period
Chapel Road / French Avenue
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 51 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
South: Chapel Road (S)															
1	L2	All MCs	31	3.4	31	3.4	0.342	12.8	LOS A	4.8	36.1	0.59	0.53	0.59	40.8
2	T1	All MCs	314	8.7	314	8.7	0.342	7.2	LOS A	4.8	36.1	0.59	0.53	0.59	41.8
3	R2	All MCs	62	1.7	62	1.7	0.153	16.9	LOS B	1.0	7.4	0.68	0.72	0.68	30.6
Approach			406	7.3	406	7.3	0.342	9.1	LOS A	4.8	36.1	0.60	0.56	0.60	39.1
East: French Avenue (E)															
4	L2	All MCs	87	1.2	87	1.2	0.220	24.1	LOS B	1.9	13.2	0.86	0.75	0.86	26.0
5	T1	All MCs	89	0.0	89	0.0	0.561	20.4	LOS B	3.7	26.2	0.96	0.80	0.99	31.0
6	R2	All MCs	62	0.0	62	0.0	0.561	31.2	LOS C	3.7	26.2	0.96	0.80	0.99	26.1
Approach			239	0.4	239	0.4	0.561	24.6	LOS B	3.7	26.2	0.92	0.78	0.94	28.0
North: Chapel Road (N)															
7	L2	All MCs	55	1.9	55	1.9	0.498	14.7	LOS B	7.5	55.9	0.66	0.60	0.66	39.0
8	T1	All MCs	426	7.7	426	7.7	* 0.498	9.2	LOS A	7.5	55.9	0.66	0.60	0.66	40.2
9	R2	All MCs	82	1.3	82	1.3	0.158	16.1	LOS B	1.2	8.8	0.62	0.71	0.62	34.1
Approach			563	6.2	563	6.2	0.498	10.7	LOS A	7.5	55.9	0.66	0.62	0.66	37.1
West: French Avenue (W)															
10	L2	All MCs	142	0.7	142	0.7	0.357	24.9	LOS B	3.2	22.2	0.89	0.77	0.89	27.4
11	T1	All MCs	217	0.0	217	0.0	0.617	20.6	LOS B	5.8	40.3	0.95	0.81	1.00	33.1
12	R2	All MCs	21	0.0	21	0.0	* 0.617	30.4	LOS C	5.8	40.3	0.95	0.81	1.00	29.0
Approach			380	0.3	380	0.3	0.617	22.7	LOS B	5.8	40.3	0.93	0.80	0.96	30.7
All Vehicles			1588	4.2	1588	4.2	0.617	15.3	LOS B	7.5	55.9	0.75	0.67	0.76	33.6

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: 3 [(FutAM) French Avenue / Jacobs Street (Site Folder: Future (Post Development))]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Future AM Peak Hour Period
French Avenue / Jacobs Street
Job No. 240874
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh]	[Dist] m				
South: Jacobs Street (S)															
1	L2	All MCs	118	0.9	118	0.9	0.130	5.6	LOS A	0.0	0.0	0.00	0.28	0.00	47.1
2	T1	All MCs	128	0.0	128	0.0	0.130	0.0	LOS A	0.0	0.0	0.00	0.28	0.00	56.0
Approach			246	0.4	246	0.4	0.130	2.7	NA	0.0	0.0	0.00	0.28	0.00	52.8
North: Jacobs Street (N)															
8	T1	All MCs	134	0.0	134	0.0	0.115	0.4	LOS A	0.4	3.0	0.25	0.29	0.25	55.9
9	R2	All MCs	65	0.0	65	0.0	0.115	6.3	LOS A	0.4	3.0	0.25	0.29	0.25	52.8
Approach			199	0.0	199	0.0	0.115	2.4	NA	0.4	3.0	0.25	0.29	0.25	54.7
West: French Avenue (W)															
10	L2	All MCs	121	0.9	121	0.9	0.310	8.7	LOS A	1.3	9.5	0.40	0.87	0.40	47.3
12	R2	All MCs	166	1.9	166	1.9	0.310	10.2	LOS A	1.3	9.5	0.40	0.87	0.40	37.4
Approach			287	1.5	287	1.5	0.310	9.6	LOS A	1.3	9.5	0.40	0.87	0.40	42.9
All Vehicles			733	0.7	733	0.7	0.310	5.3	NA	1.3	9.5	0.22	0.51	0.22	49.3

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

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

 **Site: 1 [(FutPM) Chapel Road / Rickard Road (Site Folder: Future (Post Development))]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Future PM Peak Hour Period
Chapel Road / Rickard Road
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 108 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
			veh/h	%	veh/h	%	v/c	sec							km/h
South: Chapel Road (S)															
1	L2	All MCs	85	0.0	85	0.0	0.246	41.2	LOS C	5.6	39.7	0.78	0.72	0.78	14.4
2	T1	All MCs	269	1.6	269	1.6	0.467	44.1	LOS D	9.1	64.9	0.85	0.72	0.85	19.9
Approach			355	1.2	355	1.2	0.467	43.4	LOS D	9.1	64.9	0.84	0.72	0.84	15.6
East: Rickard Road (E)															
4	L2	All MCs	208	2.0	208	2.0	0.445	22.9	LOS B	14.3	101.1	0.65	0.67	0.65	29.5
5	T1	All MCs	706	0.7	706	0.7	0.445	16.2	LOS B	14.7	103.3	0.65	0.61	0.65	30.7
6	R2	All MCs	320	6.9	320	6.9	* 0.587	21.1	LOS B	8.4	62.1	0.85	0.82	0.85	27.8
Approach			1235	2.6	1235	2.6	0.587	18.6	LOS B	14.7	103.3	0.70	0.67	0.70	29.6
North: Chapel Road (N)															
7	L2	All MCs	300	9.1	300	9.1	0.310	19.3	LOS B	8.4	63.2	0.57	0.74	0.57	28.5
8	T1	All MCs	431	1.7	431	1.7	0.785	40.9	LOS C	22.0	156.6	0.98	0.90	1.05	17.5
9	R2	All MCs	1 100.0		1 100.0		* 0.785	59.3	LOS E	22.0	156.6	0.98	0.90	1.05	12.3
Approach			732	4.9	732	4.9	0.785	32.1	LOS C	22.0	156.6	0.82	0.84	0.85	21.3
West: Rickard Road (W)															
10	L2	All MCs	57	0.0	57	0.0	0.579	37.7	LOS C	16.5	116.4	0.88	0.77	0.88	16.9
11	T1	All MCs	605	1.2	605	1.2	* 0.579	38.3	LOS C	16.5	116.4	0.87	0.76	0.87	21.6
12	R2	All MCs	63	1.7	63	1.7	0.217	34.2	LOS C	1.5	10.9	0.69	0.71	0.69	22.9
Approach			725	1.2	725	1.2	0.579	37.9	LOS C	16.5	116.4	0.86	0.75	0.86	18.6
All Vehicles			3046	2.6	3046	2.6	0.785	29.3	LOS C	22.0	156.6	0.78	0.74	0.79	22.4

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

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Project: Z:\Jobs\2024\240874\MTE SIDRA\25 01 24 - DA SIDRAs SI\25 01 24 - SI.sip9

MOVEMENT SUMMARY

 Site: 2 [(FutPM) Chapel Road / French Avenue (Site Folder: Future (Post Development))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Future PM Peak Hour Period
Chapel Road / French Avenue
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 84 seconds (Site User-Given Cycle Time)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
South: Chapel Road (S)															
1	L2	All MCs	46	0.0	46	0.0	0.529	13.9	LOS A	7.6	55.6	0.42	0.40	0.42	42.7
2	T1	All MCs	438	5.5	438	5.5	0.529	8.3	LOS A	7.6	55.6	0.42	0.40	0.42	43.5
3	R2	All MCs	117	0.9	117	0.9	0.349	27.1	LOS B	3.4	24.3	0.73	0.77	0.73	25.5
Approach			601	4.2	601	4.2	0.529	12.4	LOS A	7.6	55.6	0.48	0.47	0.48	35.0
East: French Avenue (E)															
4	L2	All MCs	66	0.0	66	0.0	0.130	30.5	LOS C	2.1	14.4	0.79	0.73	0.79	22.9
5	T1	All MCs	77	0.0	77	0.0	0.700	33.0	LOS C	6.7	47.5	1.00	0.87	1.12	22.8
6	R2	All MCs	82	1.3	82	1.3	* 0.700	53.2	LOS D	6.7	47.5	1.00	0.87	1.12	18.8
Approach			225	0.5	225	0.5	0.700	39.6	LOS C	6.7	47.5	0.94	0.83	1.02	21.3
North: Chapel Road (N)															
7	L2	All MCs	63	5.0	63	5.0	0.674	15.7	LOS B	11.5	84.0	0.50	0.48	0.50	40.0
8	T1	All MCs	544	5.6	544	5.6	* 0.674	10.2	LOS A	11.5	84.0	0.50	0.48	0.50	42.0
9	R2	All MCs	135	0.0	135	0.0	0.308	24.4	LOS B	3.5	24.8	0.66	0.75	0.66	29.6
Approach			742	4.5	742	4.5	0.674	13.3	LOS A	11.5	84.0	0.53	0.53	0.53	34.3
West: French Avenue (W)															
10	L2	All MCs	73	1.4	73	1.4	0.144	30.8	LOS C	2.3	16.1	0.79	0.74	0.79	24.6
11	T1	All MCs	132	1.6	132	1.6	0.583	31.5	LOS C	6.8	48.6	0.97	0.79	0.97	25.1
12	R2	All MCs	43	2.4	43	2.4	0.583	53.1	LOS D	6.8	48.6	0.97	0.79	0.97	21.8
Approach			247	1.7	247	1.7	0.583	35.0	LOS C	6.8	48.6	0.92	0.78	0.92	24.4
All Vehicles			1816	3.5	1816	3.5	0.700	19.2	LOS B	11.5	84.0	0.61	0.58	0.63	29.8

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY



Site: 3 [(FutPM) French Avenue / Jacobs Street (Site Folder: Future (Post Development))]

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Future PM Peak Hour Period
French Avenue / Jacobs Street
Job No. 240874
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	[Total HV]	[Veh. veh	Dist]									
			veh/h	%	veh/h	%	v/c	sec			m				km/h
South: Jacobs Street (S)															
1	L2	All MCs	162	0.0	162	0.0	0.167	5.5	LOS A	0.0	0.0	0.00	0.30	0.00	46.9
2	T1	All MCs	156	0.0	156	0.0	0.167	0.0	LOS A	0.0	0.0	0.00	0.30	0.00	55.8
Approach			318	0.0	318	0.0	0.167	2.8	NA	0.0	0.0	0.00	0.30	0.00	52.3
North: Jacobs Street (N)															
8	T1	All MCs	176	0.0	176	0.0	0.120	0.3	LOS A	0.3	2.1	0.18	0.20	0.18	57.4
9	R2	All MCs	39	0.0	39	0.0	0.120	6.6	LOS A	0.3	2.1	0.18	0.20	0.18	54.0
Approach			215	0.0	215	0.0	0.120	1.5	NA	0.3	2.1	0.18	0.20	0.18	56.6
West: French Avenue (W)															
10	L2	All MCs	100	0.0	100	0.0	0.368	9.1	LOS A	1.9	13.0	0.48	0.90	0.53	46.6
12	R2	All MCs	207	1.0	207	1.0	0.368	11.2	LOS A	1.9	13.0	0.48	0.90	0.53	36.5
Approach			307	0.7	307	0.7	0.368	10.5	LOS A	1.9	13.0	0.48	0.90	0.53	41.0
All Vehicles			840	0.3	840	0.3	0.368	5.3	NA	1.9	13.0	0.22	0.50	0.24	49.2

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

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

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

MOVEMENT SUMMARY

 **Site: 1 [(FutSunday) Chapel Road / Rickard Road (Site Folder: Future (Post Development))]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Future Sunday Network Peak Hour Period
Chapel Road / Rickard Road
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Isolated Cycle Time = 74 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh]	Dist] m				
South: Chapel Road (S)															
1	L2	All MCs	41	0.0	41	0.0	0.119	23.6	LOS B	1.7	12.3	0.76	0.68	0.76	17.0
2	T1	All MCs	136	2.3	136	2.3	0.225	24.0	LOS B	3.2	23.0	0.82	0.66	0.82	24.8
Approach			177	1.8	177	1.8	0.225	23.9	LOS B	3.2	23.0	0.80	0.66	0.80	22.8
East: Rickard Road (E)															
4	L2	All MCs	186	1.1	186	1.1	0.359	16.4	LOS B	7.5	53.0	0.61	0.65	0.61	34.0
5	T1	All MCs	558	0.2	558	0.2	0.359	10.4	LOS A	7.7	54.3	0.61	0.57	0.61	36.7
6	R2	All MCs	186	6.2	186	6.2	* 0.316	14.6	LOS B	3.3	24.5	0.65	0.73	0.65	32.6
Approach			931	1.6	931	1.6	0.359	12.4	LOS A	7.7	54.3	0.62	0.62	0.62	35.1
North: Chapel Road (N)															
7	L2	All MCs	208	5.6	208	5.6	0.240	17.5	LOS B	4.4	32.1	0.62	0.74	0.62	30.0
8	T1	All MCs	184	2.3	184	2.3	* 0.379	24.9	LOS B	5.6	40.4	0.87	0.71	0.87	24.2
9	R2	All MCs	1 100.0		1 100.0		0.379	34.4	LOS C	5.6	40.4	0.87	0.71	0.87	16.1
Approach			394	4.3	394	4.3	0.379	21.0	LOS B	5.6	40.4	0.74	0.73	0.74	27.2
West: Rickard Road (W)															
10	L2	All MCs	40	0.0	40	0.0	0.311	22.6	LOS B	5.9	41.5	0.73	0.64	0.73	24.0
11	T1	All MCs	427	0.2	427	0.2	* 0.311	17.3	LOS B	5.9	41.5	0.73	0.63	0.73	30.5
12	R2	All MCs	41	7.7	41	7.7	0.116	15.5	LOS B	0.8	5.6	0.62	0.67	0.62	25.8
Approach			508	0.8	508	0.8	0.311	17.5	LOS B	5.9	41.5	0.73	0.63	0.73	29.3
All Vehicles			2009	1.9	2009	1.9	0.379	16.4	LOS B	7.7	54.3	0.68	0.65	0.68	30.6

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: 2 [(Future) Chapel Road / French Avenue (Site Folder: Future (Post Development))]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Future Sunday Network Peak Hour Period
Chapel Road / French Avenue
Job No. 240874
Site Category: (None)
Signals - EQUISAT (Fixed-Time/SCATS) Coordinated Cycle Time = 44 seconds (Site User-Given Phase Times)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh	Dist] m				
veh/h															
%															
v/c															
sec															
km/h															
South: Chapel Road (S)															
1	L2	All MCs	72	2.9	72	2.9	0.365	9.1	LOS A	3.2	23.0	0.40	0.41	0.40	45.0
2	T1	All MCs	320	3.6	320	3.6	* 0.365	3.5	LOS A	3.2	23.0	0.40	0.41	0.40	47.7
3	R2	All MCs	31	0.0	31	0.0	0.046	10.7	LOS A	0.3	2.2	0.49	0.66	0.49	36.3
Approach			422	3.2	422	3.2	0.365	5.0	LOS A	3.2	23.0	0.40	0.43	0.40	45.9
East: French Avenue (E)															
4	L2	All MCs	40	5.3	40	5.3	0.140	23.9	LOS B	0.8	5.8	0.89	0.72	0.89	26.0
5	T1	All MCs	53	0.0	53	0.0	0.372	19.0	LOS B	2.0	14.3	0.93	0.74	0.93	32.9
6	R2	All MCs	44	2.4	44	2.4	0.372	25.5	LOS B	2.0	14.3	0.93	0.74	0.93	27.6
Approach			137	2.3	137	2.3	0.372	22.5	LOS B	2.0	14.3	0.92	0.74	0.92	29.2
North: Chapel Road (N)															
7	L2	All MCs	22	0.0	22	0.0	0.250	8.5	LOS A	1.8	13.4	0.34	0.32	0.34	46.6
8	T1	All MCs	246	4.7	246	4.7	0.250	3.0	LOS A	1.8	13.4	0.34	0.32	0.34	50.0
9	R2	All MCs	64	1.6	64	1.6	0.115	12.1	LOS A	0.8	5.4	0.56	0.69	0.56	36.5
Approach			333	3.8	333	3.8	0.250	5.1	LOS A	1.8	13.4	0.38	0.39	0.38	45.7
West: French Avenue (W)															
10	L2	All MCs	59	0.0	59	0.0	0.200	24.1	LOS B	1.2	8.2	0.90	0.73	0.90	27.9
11	T1	All MCs	73	0.0	73	0.0	* 0.391	19.0	LOS B	2.2	15.5	0.94	0.74	0.94	33.4
12	R2	All MCs	34	0.0	34	0.0	0.391	25.6	LOS B	2.2	15.5	0.94	0.74	0.94	29.2
Approach			165	0.0	165	0.0	0.391	22.2	LOS B	2.2	15.5	0.93	0.74	0.93	30.5
All Vehicles			1057	2.8	1057	2.8	0.391	10.0	LOS A	3.2	23.0	0.54	0.50	0.54	38.8

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

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

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

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

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

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

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

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

* Critical Movement (Signal Timing)

MOVEMENT SUMMARY

 **Site: 3 [(FutSunday) French Avenue / Jacobs Street (Site Folder: Future (Post Development))]**

Output produced by SIDRA INTERSECTION Version: 9.1.6.228

Future Sunday Network Peak Hour Period
French Avenue / Jacobs Street
Job No. 240874
Site Category: (None)
Stop (Two-Way)

Vehicle Movement Performance															
Mov ID	Turn	Mov Class	Demand Flows		Arrival Flows		Deg. Satn	Aver. Delay	Level of Service	95% Back Of Queue		Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed
			[Total HV]	%	[Total HV]	%				[Veh. veh]	[Dist] m				
South: Jacobs Street (S)															
1	L2	All MCs	102	0.0	102	0.0	0.094	5.5	LOS A	0.0	0.0	0.00	0.34	0.00	46.3
2	T1	All MCs	77	0.0	77	0.0	0.094	0.0	LOS A	0.0	0.0	0.00	0.34	0.00	55.4
Approach			179	0.0	179	0.0	0.094	3.2	NA	0.0	0.0	0.00	0.34	0.00	51.3
North: Jacobs Street (N)															
8	T1	All MCs	54	2.0	54	2.0	0.040	0.2	LOS A	0.1	0.8	0.16	0.20	0.16	56.8
9	R2	All MCs	19	0.0	19	0.0	0.040	6.0	LOS A	0.1	0.8	0.16	0.20	0.16	53.5
Approach			73	1.4	73	1.4	0.040	1.7	NA	0.1	0.8	0.16	0.20	0.16	55.9
West: French Avenue (W)															
10	L2	All MCs	41	0.0	41	0.0	0.144	8.3	LOS A	0.5	3.7	0.26	0.89	0.26	48.0
12	R2	All MCs	108	0.0	108	0.0	0.144	8.5	LOS A	0.5	3.7	0.26	0.89	0.26	38.5
Approach			149	0.0	149	0.0	0.144	8.4	LOS A	0.5	3.7	0.26	0.89	0.26	42.3
All Vehicles			401	0.3	401	0.3	0.144	4.9	NA	0.5	3.7	0.12	0.52	0.12	48.8

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

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

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

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

Two-Way Sign Control Capacity Model: SIDRA Standard.

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

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

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

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

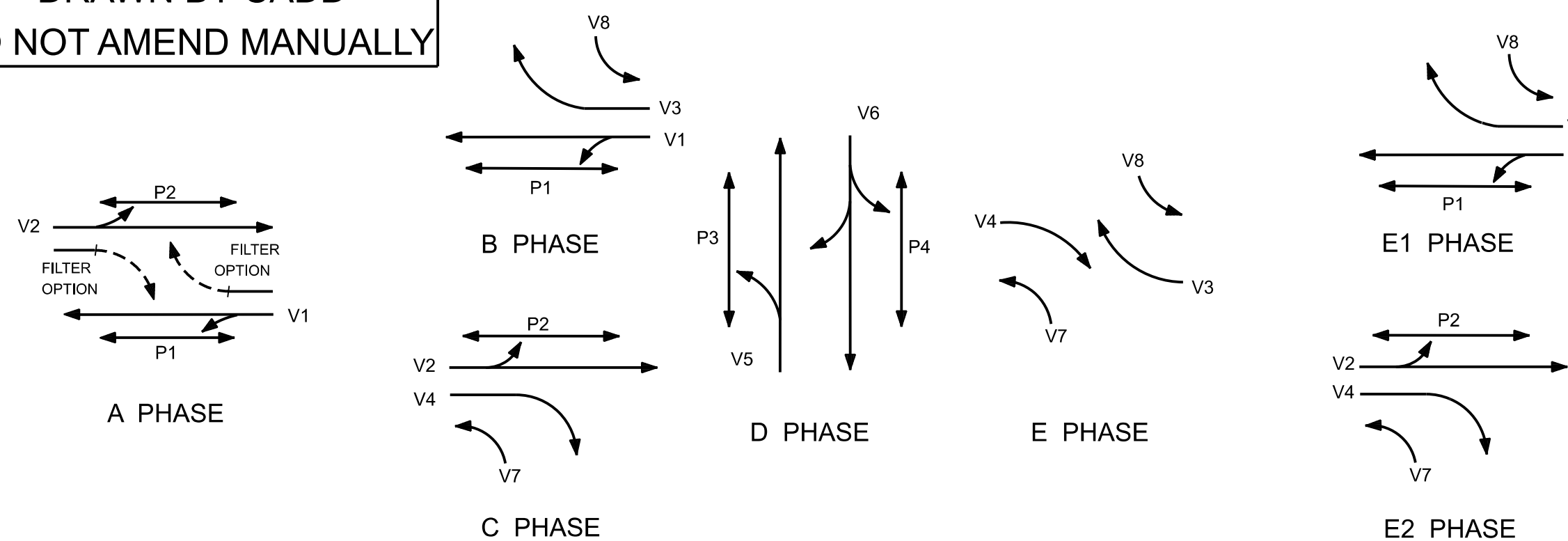
Arrival Flows used in performance calculations are adjusted to include any Initial Queued Demand and Upstream Capacity Constraint effects.



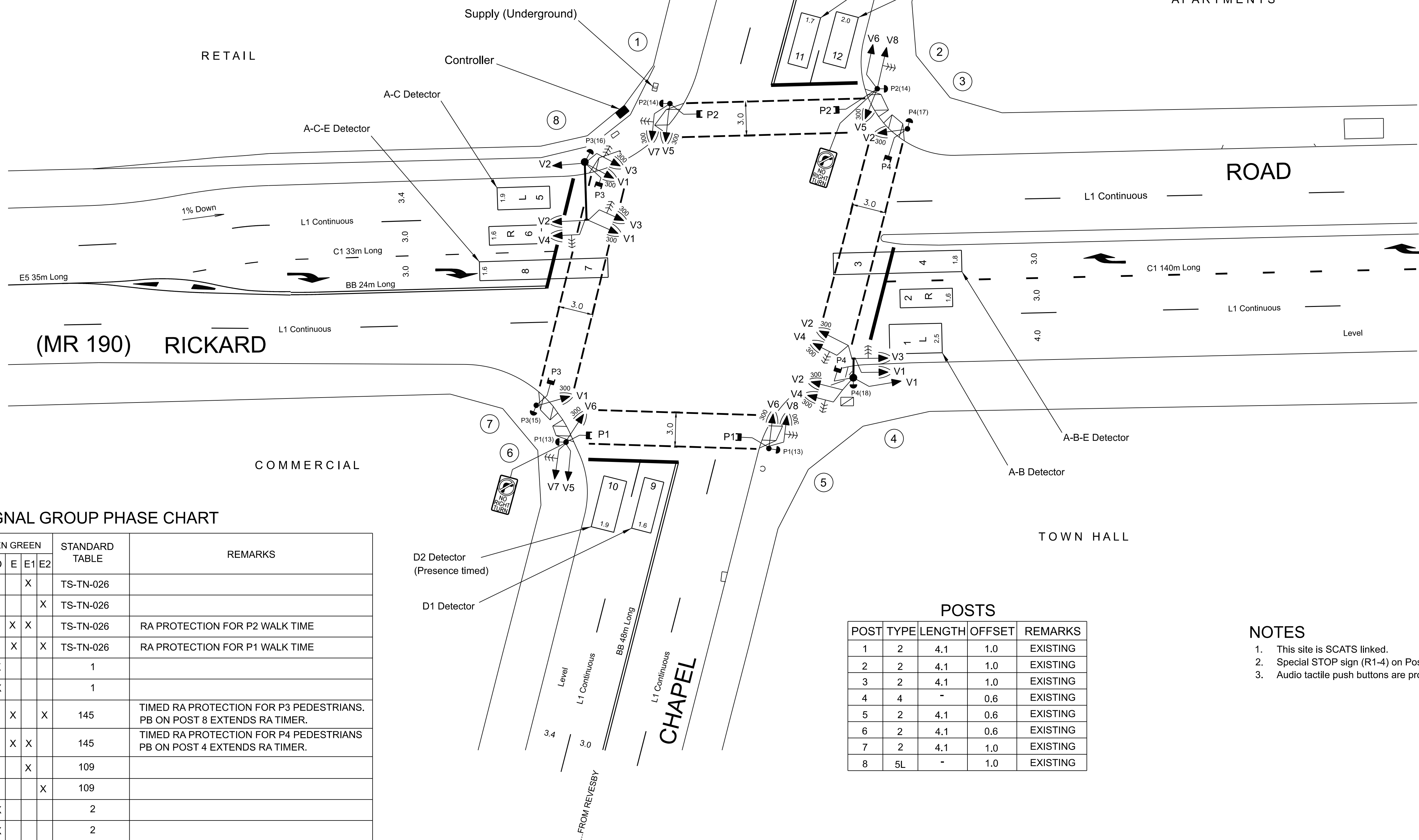
**ANNEXURE D: TCS PLANS
(2 SHEETS)**

DRAWN BY CADD
DO NOT AMEND MANUALLY

DATE IN SERVICE : 11/06/76



MOVEMENTS



SIGNAL GROUP PHASE CHART

SIGNAL GROUP	PHASE WHEN GREEN							STANDARD TABLE	REMARKS
	A	B	C	D	E	E1	E2		
V1	X	X				X		TS-TN-026	
V2	X		X				X	TS-TN-026	
V3		X		X	X			TS-TN-026	RA PROTECTION FOR P2 WALK TIME
V4			X	X		X		TS-TN-026	RA PROTECTION FOR P1 WALK TIME
V5				X				1	
V6				X				1	
V7			X	X		X		145	TIMED RA PROTECTION FOR P3 PEDESTRIANS. PB ON POST 8 EXTENDS RA TIMER.
V8		X		X	X			145	TIMED RA PROTECTION FOR P4 PEDESTRIANS PB ON POST 4 EXTENDS RA TIMER.
P1	X	X				X		109	
P2	X		X				X	109	
P3				X				2	
P4				X				2	

POSTS

POST	TYPE	LENGTH	OFFSET	REMARKS
1	2	4.1	1.0	EXISTING
2	2	4.1	1.0	EXISTING
3	2	4.1	1.0	EXISTING
4	4	-	0.6	EXISTING
5	2	4.1	0.6	EXISTING
6	2	4.1	0.6	EXISTING
7	2	4.1	1.0	EXISTING
8	5L	-	1.0	EXISTING

NOTES

- This site is SCATS linked.
- Special STOP sign (R1-4) on Posts 2 and 6.
- Audio tactile push buttons are provided on all posts.

A ORIGINAL ISSUE JL SWR 5477 1.4.93 ADDED SDO ALTERED KERBLINES TO SUIT ROADWORKS. TH CHECKED GE T5233 B Issue JL SWR800 17/10/1995 Addt-Reg Stop Sign on posts 2.5 and 6. K.K. 26/10/1995 C ISSUE JL SH 570 ADDED NRT SIGNS TO POSTS 2 & 6 (BOTH DIRECTIONS), P3 & P4 PERS SPLIT. COUNCIL (B-LINE) 18/9/2015 A.P. 18/9/15 D ISSUE OFFICE INSTRUCTION SOUTHBOUND NRT SIGNS REMOVED AS PER COUNCIL'S TMP COUNCIL (B-LINE) 3/12/2015 E Issue: WAE F Issue: WAE TL NSW 09/2019 NP 24/07/2020 AL	PUBLIC UTILITY LEGEND HYDRANT STOP VALVE GAS VALVE SEWER MANHOLE TELECOM PIT ELECT LIGHT POLE POWER POLE STAY POLE TELEPHONE BOX TELECOM PILLAR	REFERENCE PLANS SYMBOLS/ABBS. VD003-6 STD POSIT VD001-5 DET SCHED EXP VD018-10 PRES. DETECT VC005-17 SSG DIS. SEQ. VD018-8 CABLE INSTALL. SHEET 7 CABLE CHART SHEET 9 SURVEYOR: DIGITISER DATE: 14/12/92	U.B.D. Ref. MAP 251 Q15 I.S.G. E: 303 050 CO-ORDS N: 1 254 850 DESIGNED T.HUFTON CHECKED G.EYRE T.HUFTON SITE CHECKED F.D.REID RECOMMENDED	APPROVED A.J. WESLEY DESIGN ENGINEER 10.06.93 ACCEPTED 10.6.93 DATE	ROADS AND MARITIME SERVICES BANKSTOWN COUNCIL AREA TRAFFIC SIGNALS AT (MR 190) CHAPEL ROAD AND (MR 190) RICKARD ROAD BANKSTOWN DESIGN LAYOUT	EXISTING ☒ PROPOSED ☐ CADD FILE: VV1800_5E_DES.dgn SCALE 5 0 (1:200) 5 10 FILE SF2014/010021 REGN. DS2014/001594 TCS No. 1203 SHEET 5
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DETECTOR SPECIFICATION

DETECTOR	SPECIFICATION		
	FN	A(L)	A(E1)
A1	SG	A	A
	DS	—	—
	FN	A(L)	A(E2)
A2	SG	A	A
	DS	—	—
	FN	B(L)	B(E1)
B1	SG	B	B
	DS	—	—
	FN	B(L)	B(E2)
B2	SG	B	B
	DS	—	—
	FN	B(L)	B(E2)
P1	SG	P1(WALK)	A.P1(WALK)
	DS	—	B
	FN	A(PB)	B(L)
P2	SG	P2(WALK)	A.P2(WALK)
	DS	—	B
	FN	A(PB)	B(L)
P3	SG	P3(WALK)	B.P3(WALK)
	DS	—	A
	FN	B(PB)	A(L)
P4	SG	P4(WALK)	B.P4(WALK)
	DS	—	A
	FN	B(PB)	A(L)

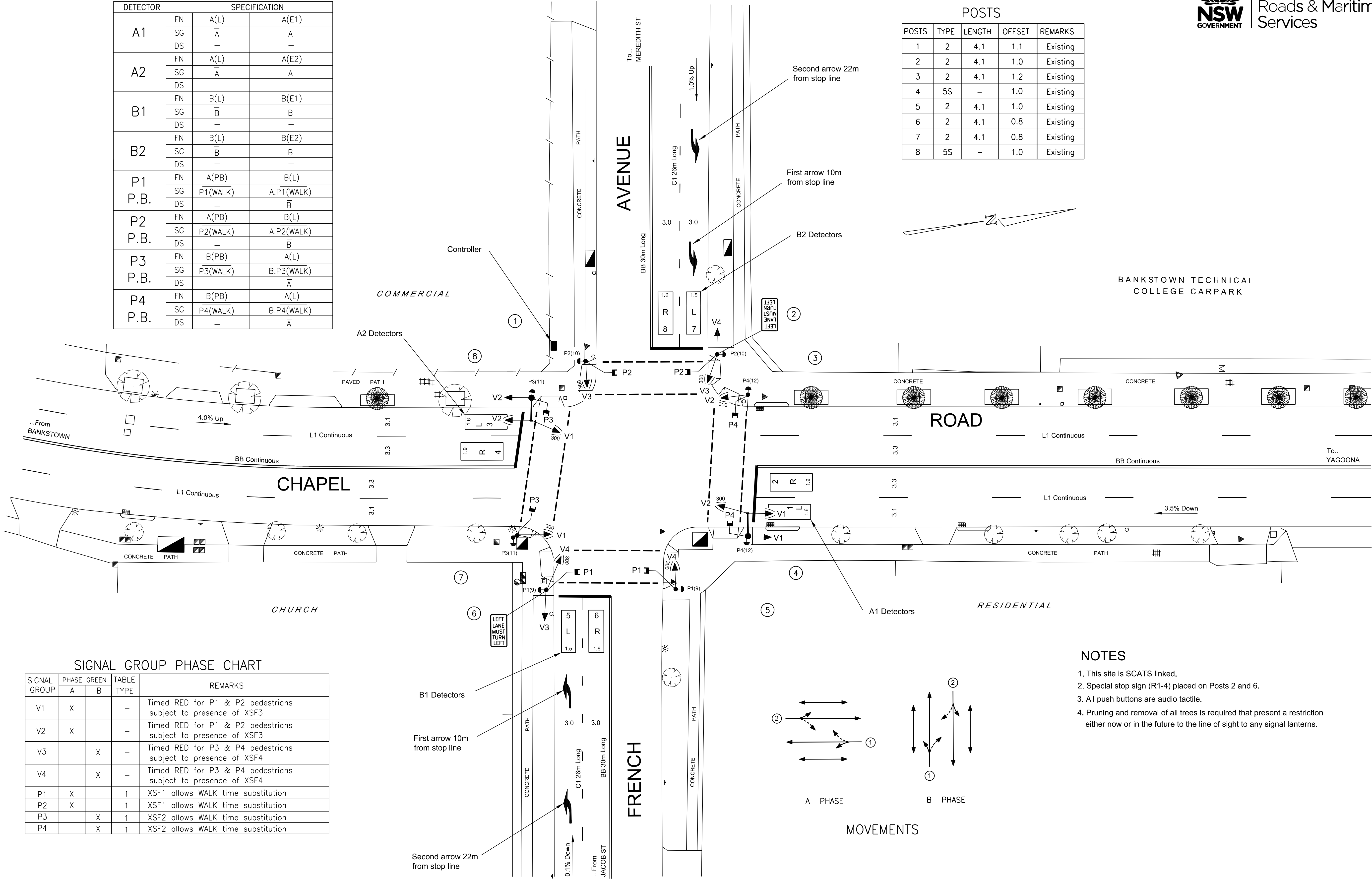
DATE IN SERVICE : 20 JUNE 2011



Transport
Roads & Maritime
Services

POSTS

POSTS	TYPE	LENGTH	OFFSET	REMARKS
1	2	4.1	1.1	Existing
2	2	4.1	1.0	Existing
3	2	4.1	1.2	Existing
4	5S	—	1.0	Existing
5	2	4.1	1.0	Existing
6	2	4.1	0.8	Existing
7	2	4.1	0.8	Existing
8	5S	—	1.0	Existing

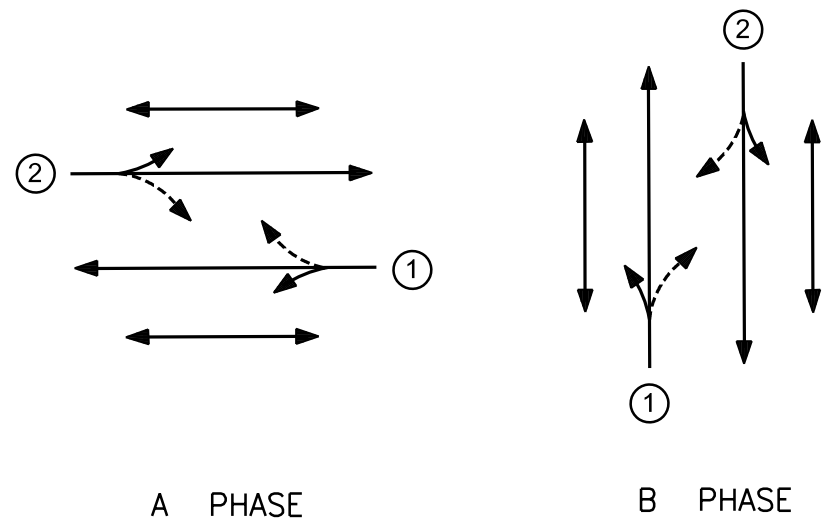


SIGNAL GROUP PHASE CHART

SIGNAL GROUP	PHASE GREEN		TABLE TYPE	REMARKS
	A	B		
V1	X		—	Timed RED for P1 & P2 pedestrians subject to presence of XSF3
V2	X		—	Timed RED for P1 & P2 pedestrians subject to presence of XSF3
V3		X	—	Timed RED for P3 & P4 pedestrians subject to presence of XSF4
V4		X	—	Timed RED for P3 & P4 pedestrians subject to presence of XSF4
P1	X		1	XSF1 allows WALK time substitution
P2	X		1	XSF1 allows WALK time substitution
P3		X	1	XSF2 allows WALK time substitution
P4		X	1	XSF2 allows WALK time substitution

NOTES

1. This site is SCATS linked.
2. Special stop sign (R1-4) placed on Posts 2 and 6.
3. All push buttons are audio tactile.
4. Pruning and removal of all trees is required that present a restriction either now or in the future to the line of sight to any signal lanterns.



A ORIGINAL ISSUE

'B' ISSUE
WAE 05/11
MINOR POST POSITION CHANGES.
NOTES AMENDED TO SUIT WAE
CORRIGAN

PUBLIC UTILITY LEGEND		REFERENCE PLANS		U.B.D. Ref.	
HYDRANT	□	SYMBOLS/ABBS.	VD003-6	I.S.G. E.	303 134
STOP VALVE	▲	STD POSIT	VD001-5	CO-ORDS N:	1 246 009
GAS VALVE	±	DET SCHED EXP	VD018-10	DESIGNED	J BATES
SEWER MANHOLE	⊕	PRES. DETECT	VC005-17	CHECKED	J BATES
TELECOM PIT	⊞	SSG DIS. SEQ.	VD018-8	SITE CHECKED	J BATES
ELECT LIGHT POLE	○	CABLE CHART	SHEET 3		
POWER POLE	○	INSTALL LAYOUT	SHEET 2		
STAY POLE	⊙				
TELEPHONE BOX	□	SURVEYOR : BCC			
TELECOM PILLAR	●	DATE : 2010			

DESIGN APPROVAL	RMS ACCEPTANCE
APPROVED POSITION : MANAGER DATE : 10/12/10	RECOMMENDED POSITION : Network Operations Leader DATE : 23/12/10
B-Line Drafting behalf of Council	ACCEPTED POSITION : RNL DATE : 23/12/10

ROADS AND MARITIME SERVICES	
BANKSTOWN CITY COUNCIL AREA TRAFFIC SIGNALS AT THE INTERSECTION OF CHAPEL ROAD AND FRENCH AVENUE BANKSTOWN	
DESIGN LAYOUT	TCS No 4408

EXISTING ☒ PROPOSED ☐	
CADD FILE: VV4408_1B.dgn	
SCALE 5 0 (1:200) 5 10	ISSUE B
FILE 26 TS 382 REGN. 7000.026.VV.4408	SUPERSEDES SHEET/ISSUE 1/A SHEET 1



**ANNEXURE E: TRAVEL MODE DURVEY QUESTIONNAIRE
(2 SHEETS)**

TRAVEL MODE SURVEY QUESTIONS

How did you arrive to church today?

- Car (as Driver)
- Passenger in Car
- Train (Due to the closure of Bankstown Station, select this option if the train is your usual mode of transport)
- Public Bus
- Only Walked
- Bicycle
- Motorcycle
- Taxi, Uber or other on-demand transport services
- Other – Please specify _____

If you drove, how many passengers were in the car with you? _____

If you drove, where did you park?

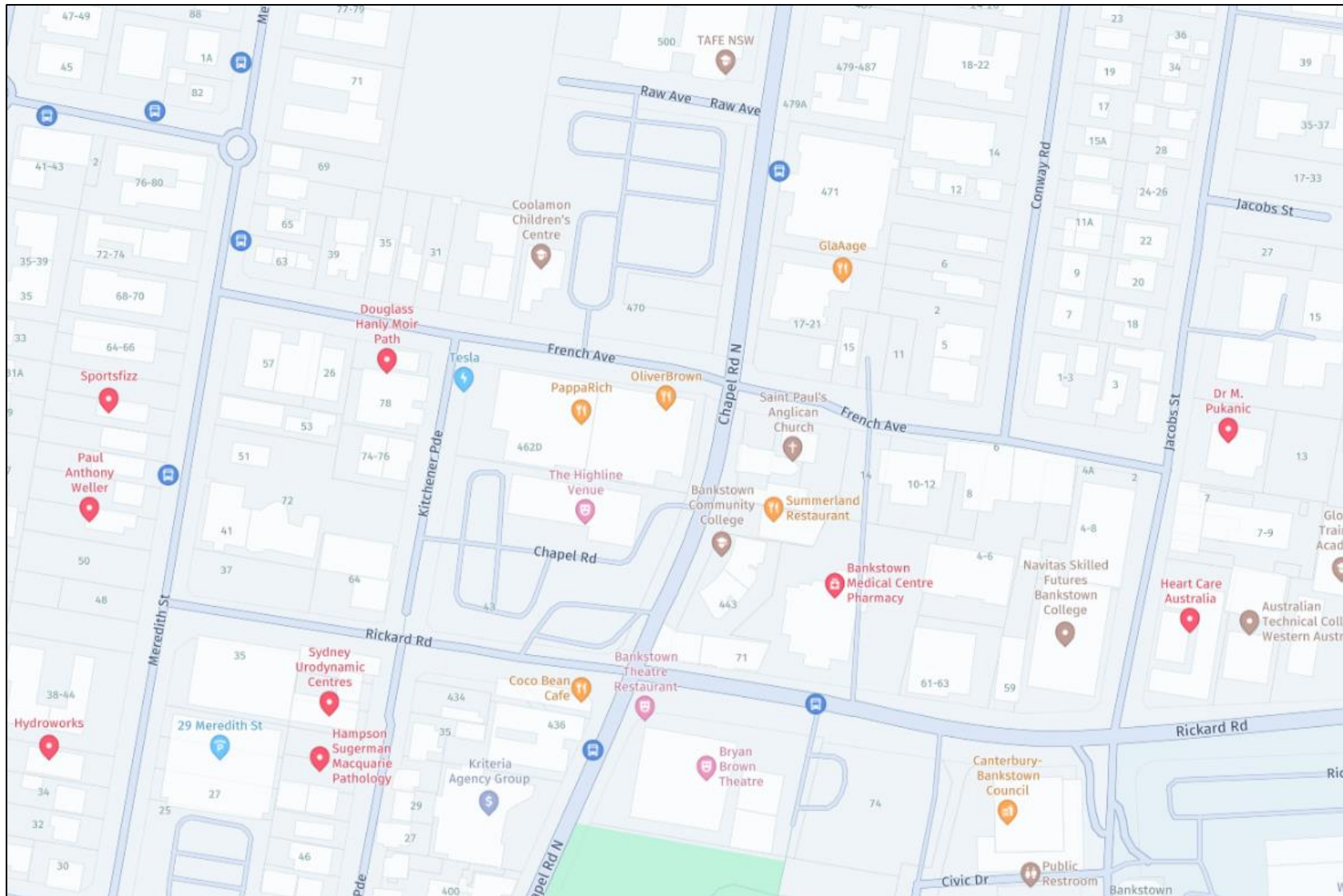
- On-Site
- On-Street
- Public Car Park

If you drove, parked 'On-Street' or 'Public Car Park', what street/car park did you park in? _____

How will you depart church today?

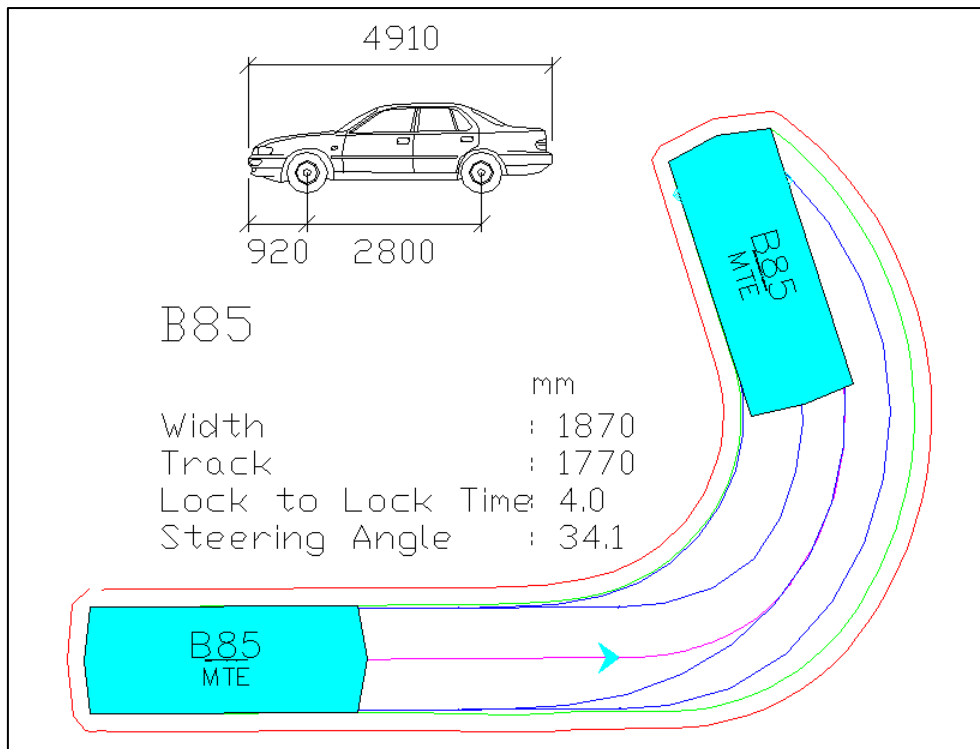
- Car (as Driver)
- Passenger in Car
- Train (Due to the closure of Bankstown Station, select this option if the train is your usual mode of transport)
- Public Bus
- Only Walked
- Bicycle
- Motorcycle
- Taxi, Uber or other on-demand transport services
- Other – Please specify _____

MAP OF SURROUNDING STREETS

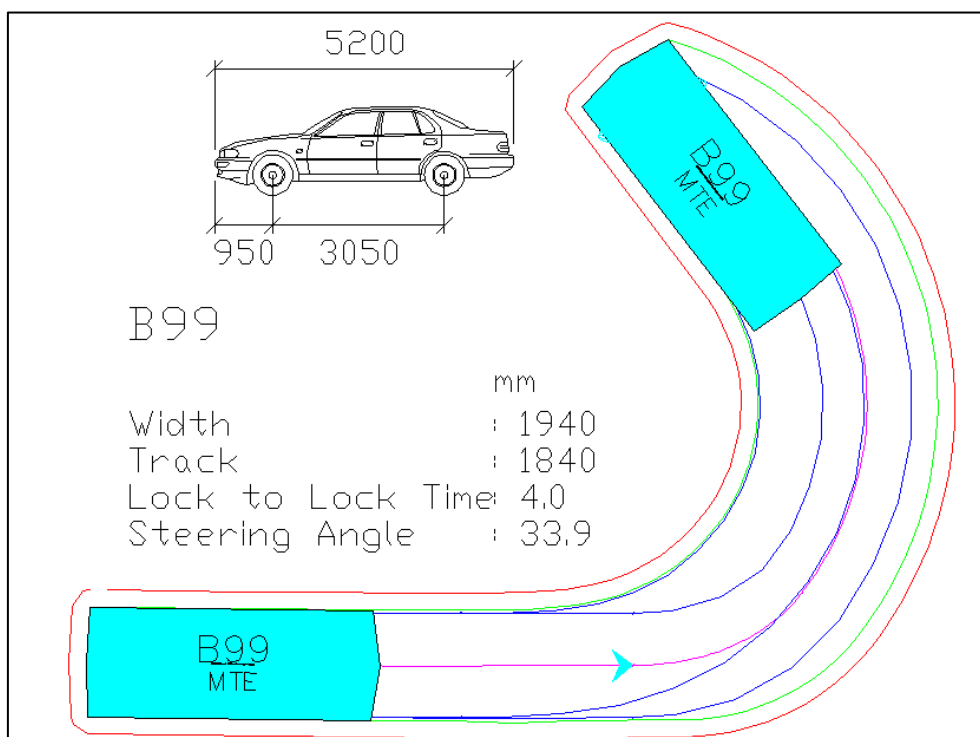




**ANNEXURE F: SWEPT PATH TEST RESULTS
(7 SHEETS)**



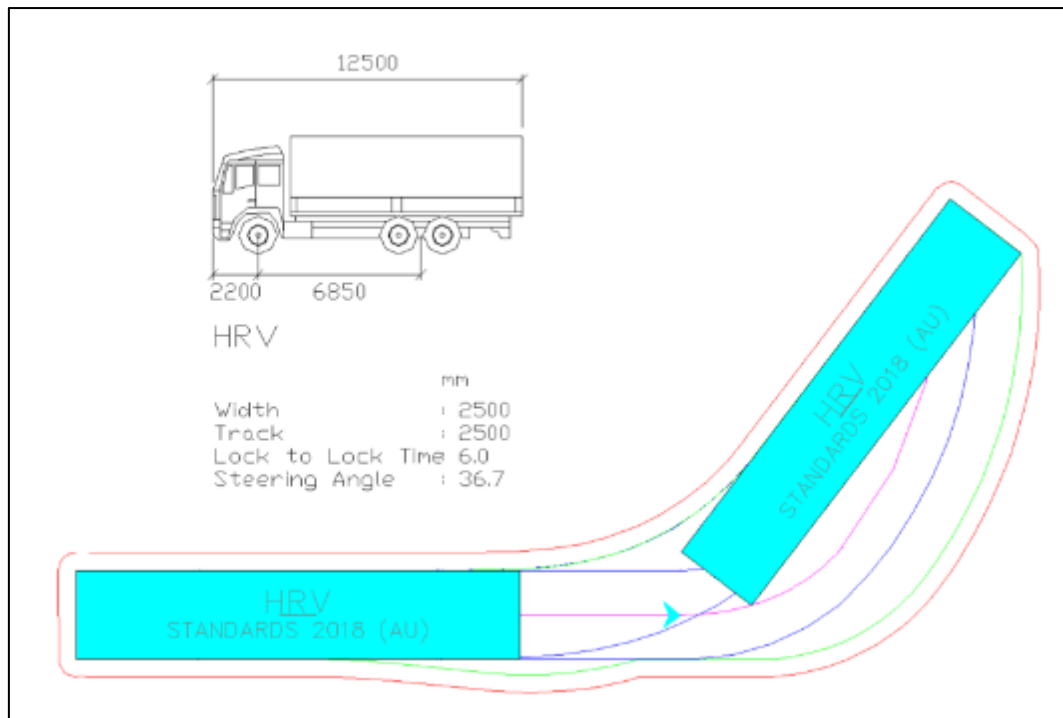
AUSTRALIAN STANDARD 85TH PERCENTILE SIZE VEHICLE (B85)



AUSTRALIAN STANDARD 99.8TH PERCENTILE SIZE VEHICLE (B99)

Blue – Tyre Path
 Green – Vehicle Body
 Red – 300mm Clearance

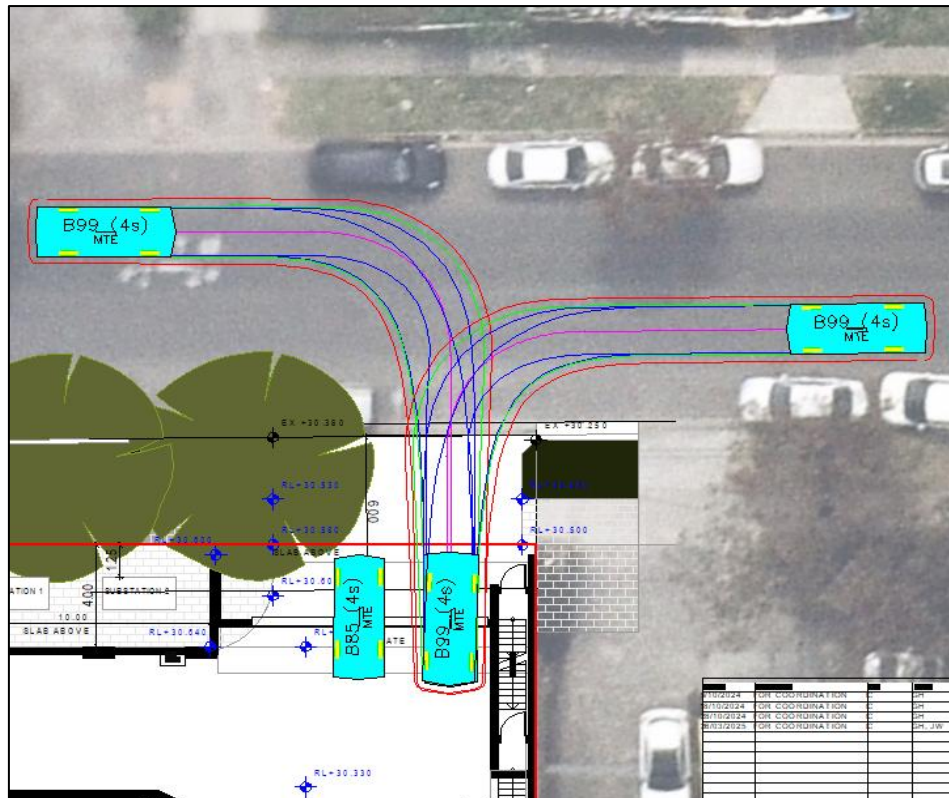
All tests performed at 10km/h on public roads and 5km/h internally.



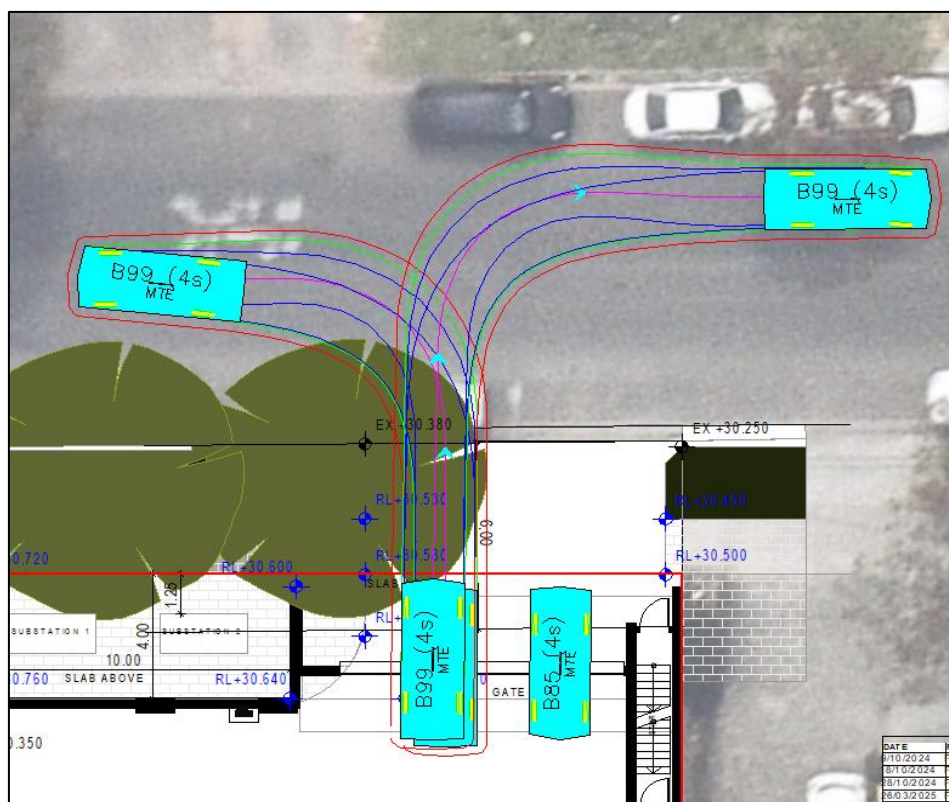
AUSTRALIAN STANDARD HEAVY RIGID VEHICLE (HRV)

Blue – Tyre Path
Green – Vehicle Body
Red – 500mm Clearance

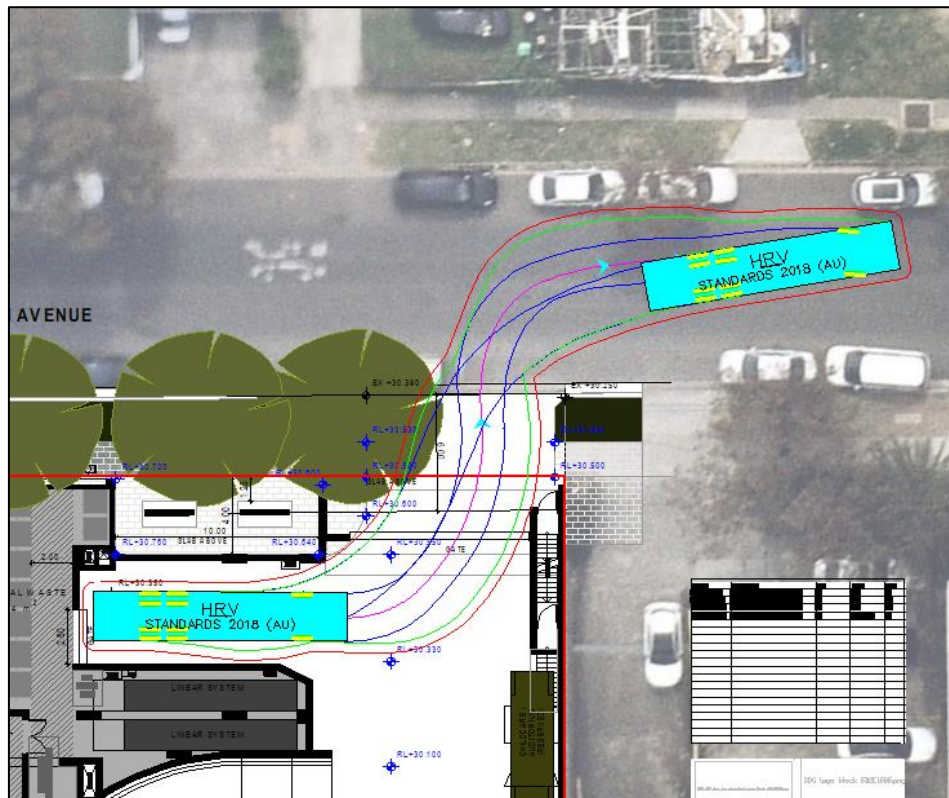
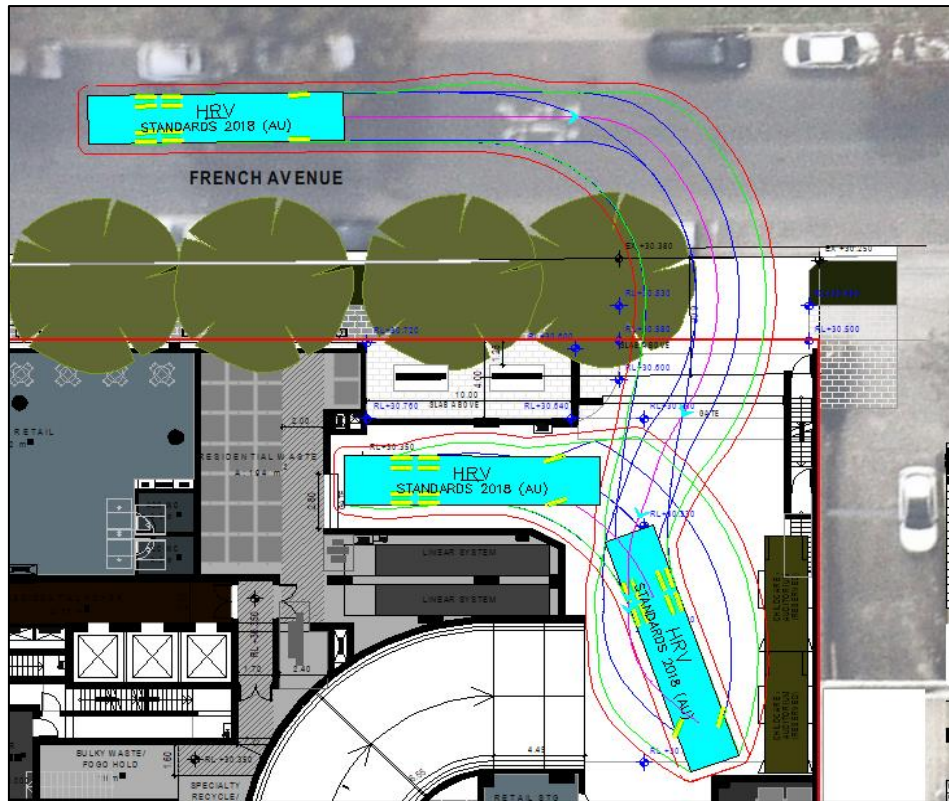
All tests performed at 10km/h on public roads and 5km/h internally.



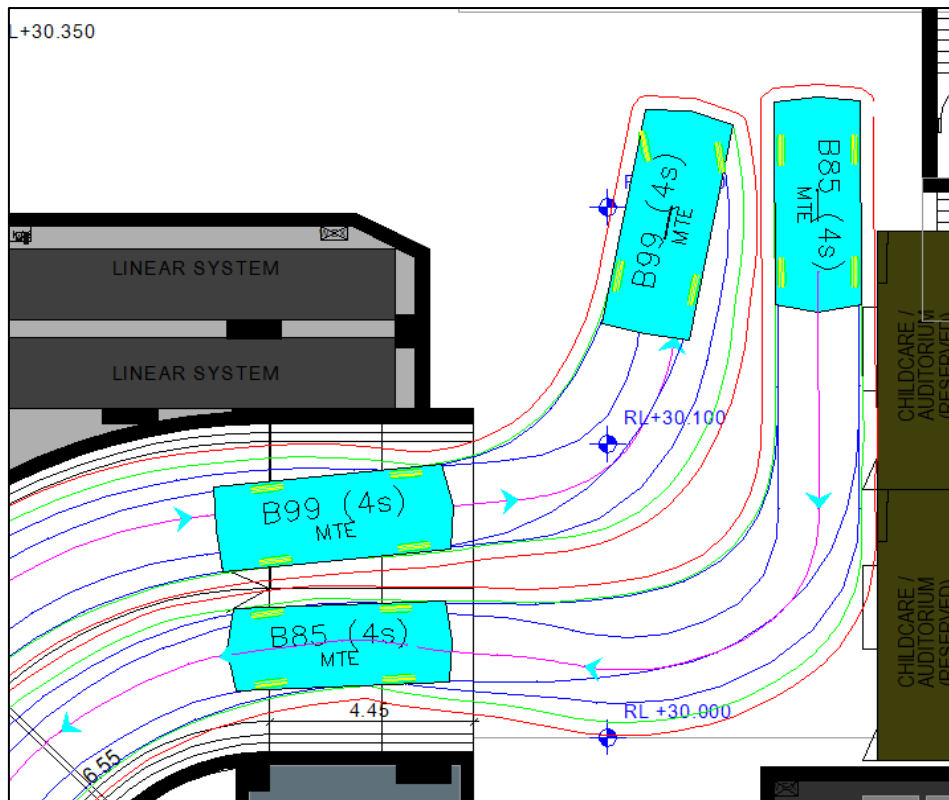
**B99 – SITE ACCESS
SUCCESSFUL**



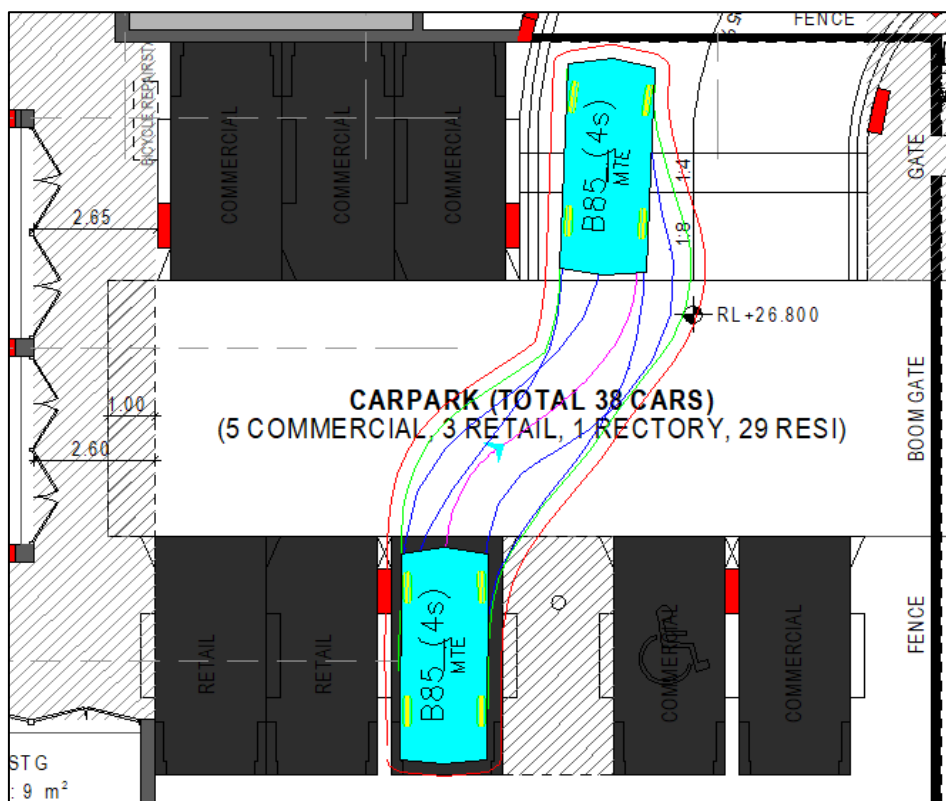
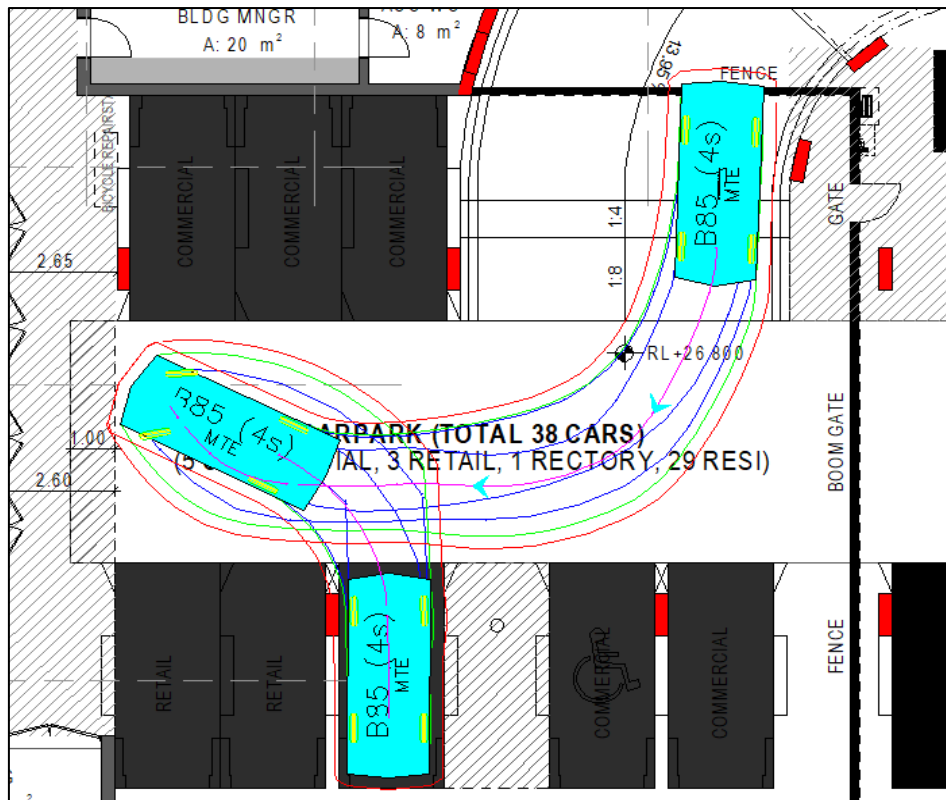
**B99 – SITE EGRESS
SUCCESSFUL**



12.5M LENGTH HRV – SITE ACCCES, SITE EGRESS AND LOADING SUCCESSFUL – 2 Manoeuvres Reverse IN, 1 Manoeuvre Forward OUT



**B99 AND B85 – SIMULTANEOUS PASSING WITHIN RAMP
SUCCESSFUL**



GROUND FLOOR ACCESSIBLE SPACE [1] – B85 PARKING
SUCCESSFUL – 2 Manoeuvres Reverse IN, 1 Manoeuvre Forward OUT

