Hemanote Consultants

5 WARREN AVENUE, BANKSTOWN

PROPOSED INDUSTRIAL DEVELOPMENT

TRAFFIC & PARKING IMPACT ASSESSMENT

DECEMBER 2024

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TRAFFIC & PARKING IMPACT ASSESSMENT
5 WARREN AVENUE, BANKSTOWN
PROPOSED INDUSTRIAL DEVELOPMENT
DATE: 20 DECEMBER 2024

DISCLAIMER

Doc. Revision	Prepared by	Reviewed by	Issued by	Issue date
Draft 1 (internally)	S. Payet	R. Selim	S. Payet	09 Dec 2024
Draft 2 (internally)	S. Payet	R. Selim	S. Payet	17 Dec 2024
Final report (to client)	S. Payet	R. Selim	S. Payet	20 Dec 2024

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1 INTRODUCTION

This report has been prepared by Hemanote Consultants to assess the traffic and parking implications for the proposed industrial warehouse development at **5 Warren Avenue, Bankstown**.

This report is to be read in conjunction with the architectural plans prepared by Ridge Designs (reduced copy of the plans is attached in *Appendix 'A'* of this report) and submitted to the Canterbury Bankstown Council as part of a Development application.

This report is set as follows:

- Section 2: Description of the existing site location and its use;
- Section 3: Description of existing traffic conditions near the subject site;
- Section 4: Description of the proposal, vehicular access, on-site parking provision, layout and circulation;
- Section 5: Assessment of impacts on parking;
- Section 6: Assessment of impacts on traffic in the vicinity of the subject site; and
- Section 7: Outlines conclusions.

2 EXISTING SITE DESCRIPTION

➢ ***Site Location***

The subject site is located on the eastern side of Warren Avenue at property No. 5 (legally known as Lot 181 of DP13506), within the suburb of Bankstown. The site has a frontage of 12.2 metres to Warren Avenue from the west. Refer to Figure 1 for a site locality map.

Figure 1: Site Locality Map

- ***Existing Site & Surrounding Land Use***

The subject site has an area of 777.8m^2 and is currently occupied by vacant space. It is located in a mixed industrial and commercial area, characterised by industrial and commercial type developments.

The site is also located approximately 2.1 km from Punchbowl Railway Station and 2.4 km from Bankstown Railway Station.

Photo 1: Site frontage to Warren Avenue

3 EXISTING TRAFFIC CONDITIONS

3.1 Road Network and Classification

Warren Avenue is a local road that runs in a north-west to south-east direction, between its cul-de-sac end to the north-west and Canterbury Road (state Road) to the south-east. Warren Avenue intersects with Canterbury Road near the subject site.

3.2 Road Description and Traffic Control

Warren Avenue has a two-way undivided carriageway with a width between kerbs of approximately 11 metres, with a wider width of approximately 18 metres at its cul-de-sac end. This carriageway provides one travel lane per direction, with unrestricted kerbside parking available along both sides of the road.

The legal speed limit on Warren Avenue is 50km/h. Warren Avenue intersects with Canterbury Road near the subject site which is controlled by 'T-priority' traffic measures, given to traffic travelling along Canterbury Road.

Figure 2: Aerial photograph of the subject site and surrounding road network

Photo 2: Warren Avenue at the subject site – facing north-west

Photo 3: Warren Avenue at the subject site – facing south-east

3.3 Current Traffic Flows

A traffic volume survey was undertaken by Hemanote Consultants at the intersection of:

- Warren Avenue / Canterbury Road

in the vicinity of the subject site on Wednesday 27 November 2024, during morning period (7.00am to 10.00am) and afternoon period (3.00pm to 6.00pm), considering the developments proposed hours of operation and traffic peak periods.

The traffic flows in the morning & afternoon peak hours are shown in Table 1 below.

Traffic movement	Morning Peak Hour (Vehicles Per Hour)	Evening Peak Hour (Vehicles Per Hour)
	7.15am – 8.14am	3.00pm – 4.00pm
Warren Avenue		
Northbound	15	9
Southbound	6	11
Canterbury Road (East of Warren Avenue) – Two lanes		
Eastbound	1,539	1,653
Canterbury Road (West of Warren Avenue) – Two lanes		
Eastbound	1,537	1,654

Table 1: Current traffic flows in the vicinity of the subject site (on a typical weekday)

The results of the traffic volume counts undertaken determined that the traffic morning peak period on Warren Avenue / Canterbury Road was between 7.15am to 8.15am and the afternoon peak period was between 3.00pm to 4.00pm on a typical weekday.

The existing traffic flows on Warren Avenue and Canterbury Road are appropriate for a local road and a state road, respectively, in a mixed industrial and commercial area, where traffic in Warren avenue is free flowing without major queuing or delays near the subject site in peak hours, with spare capacity.

It is determined that the existing mid-block level of service on Warren Avenue is at level 'A' in accordance with Table 4.4 of the Roads & Maritime Services' *"Guide to Traffic Generating Developments - 2002"* (below).

Level of Service	One Lane (veh/hr)	Two Lanes (veh/hr)
A	200	900
B	380	1400
C	600	1800
D	900	2200
E	1400	2800

Table 4.4: Urban road peak hour flows per direction RMS Guide)

- ***Current Intersection Performance (pre-development)***

Average Vehicle Delay (AVD) and Level of Service (LOS) – The AVD and LOS provide a measure of the operational performance of an intersection, as indicated in Table 4.2 of the Roads & Maritime Services "*Guide to Traffic Generating Developments - 2002*" (shown on the following page).

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

Table 4.2: Level of Service Criteria for intersections (RMS Guide)

A **pre-development** SIDRA intersection performance analysis was undertaken for the existing intersection of Warren Avenue / Canterbury Road, in the vicinity of the subject site (Pre-development).

Refer to Figure 3 on the following page, showing the intersection layout controlled by T-priority traffic measures. Warren Avenue has an undivided carriageway with one through traffic lane in each direction, whereas Canterbury Road has a divided carriageway, with two through traffic lanes in each direction.

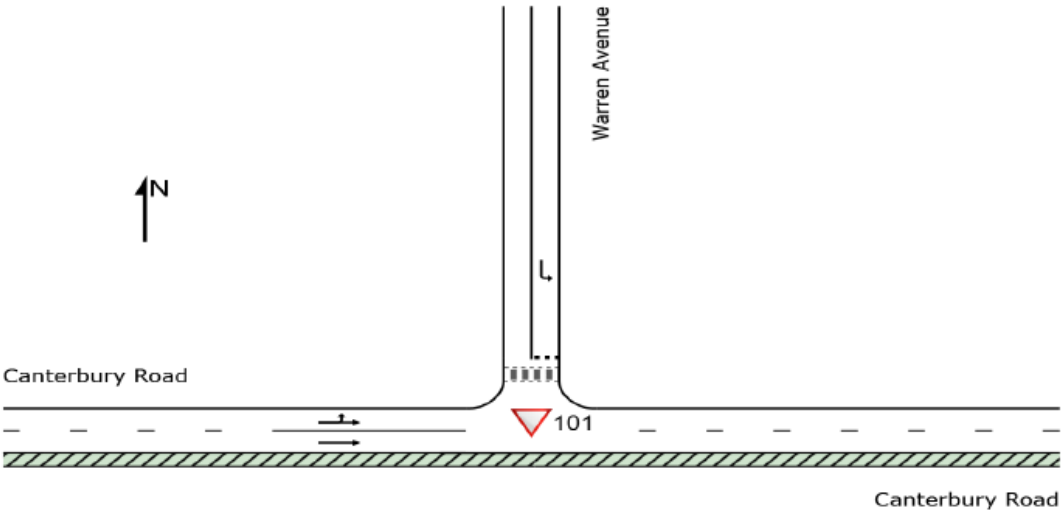

Figure 3: Existing Intersection Layout

The **pre-development** SIDRA performance analysis determined that the current operational performance of the existing intersection of Warren Avenue / Canterbury Road is in good operation at an overall Level of Service (LOS) 'A' during AM and PM Peak periods.

Refer to the summary of the results of the SIDRA intersection performance analysis attached in *Appendix 'C'* of this report.

3.4 Existing Transportation Services

The subject site has good access to public transport services in the form of trains and buses. The site is located approximately 2.1 km from Punchbowl Railway Station and 2.4 km from Bankstown Railway Station.

Frequent bus services operate along Canterbury Road, Lancaster Avenue, Warwick Street, Punchbowl Road, Stacey Street, Gowrie Avenue, Fairford Road, Chapel Road and Cullens Road, in close proximity to the subject site (i.e. bus routes M90, M91, 487, 922, 923, 924, 944, 945 and 960).

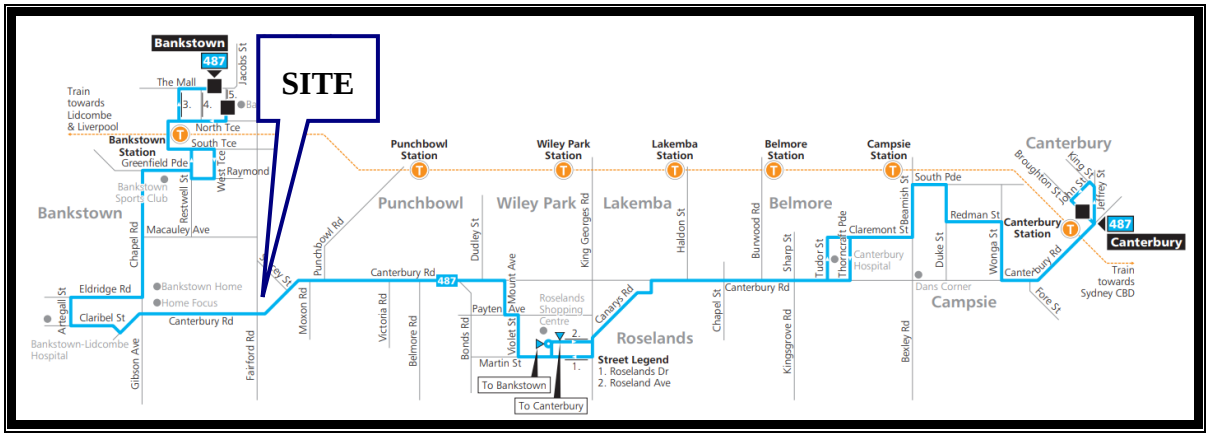

Figure 4: Bus services near the subject site (Bus Route No. 487)

4 PROPOSED DEVELOPMENT

4.1 Description of the Proposal

The proposed development seeks approval for the construction of an industrial warehouse development at **5 Warren Avenue, Bankstown**.

The proposed development will include the following:

- Two (2) ground level industrial warehouse units, with associated foyer and amenities, with a total GFA of 301.62m^2.
- Two (2) mezzanine level office areas, with a total GFA of 70.22m^2.
- One (1) dedicated loading and unloading area on ground level, which can accommodate up to a Small Rigid Vehicle (SRV – 6.4 metres in length).
- A total of four (4) on-site car parking spaces, including 1 accessible parking space with an adjacent shared area, on ground level. Bicycle storage spaces for staff are to be provided on-site.

The largest size vehicle to access the site will be a Small Rigid Vehicle (SRV – 6.4 metres in length).

Refer to ***Appendix 'A'*** for the proposed development plans.

4.2 Vehicular Access

The vehicular access to and from the on-site parking facilities will be via the existing access driveway crossing located in Warren Avenue, which is to be widened at the boundary, and leading to an existing internal right of carriageway.

The access driveway is to have a width of 3.9 metres at the boundary and is to provide access for both passenger and small heavy vehicles. This is adequate for a low volume (Category 1) access driveway in accordance with AS2890.1:2004 – Table 3.2 and AS2890.2:2018 for SRV truck access, for one vehicle travelling through at a time.

This access driveway is to provide two-way (one vehicle at a time) vehicular movements, without causing delays or congestion to traffic on the street. The access driveway is located more than 6 metres from the tangent point of the adjacent kerbline, in accordance with Figure 3.1 of AS2890.1:2004.

The clear sight line triangle (2.5m x 2m) between the driver's eye view and pedestrians is provided on the exit side of the driveway, as per Figure 3.3 of AS2890.1:2004 and Figure 3.4 of AS2890.2:2018.

4.3 On-site Parking Provision

Canterbury-Bankstown Development Control Plan 2023, Chapter 3, Section 2, requires on-site parking for industrial warehouse developments to be provided at the following rates:

- **1 car space per 300m² of GFA** or 1 car space per 2 staff, whichever is the greater.
- Note 2: Where an office component is involved and provided this does not exceed 20% of the total gross floor area, 1 car space per 100m² gross floor area is to be provided. Any additional office space will be assessed at a rate of 1 car space per 40m² gross floor area.
- Bicycle – 1 space per 20 staff.

Refer to Table 2 below for required & proposed parking provision for the subject site:

Parking requirements	Car parking rates	Proposed No. / Area	Car parking spaces required	Total car parking spaced required
Industrial				
Industrial Warehouse Units	1 space per 300m²	301.62m²	1.005	1
Mezzanine Office (Up to 20% of total GFA)	1 space per 100m²	14.044m²	0.140	2
Mezzanine Office (Over 20% of total GFA)	1 space per 40m²	56.176m²	1.404	
Total		**371.84m²**	**2.549**	**3**
Total car parking required			**3**	
Total car parking proposed			**4**	
Compliance with Council's car parking requirements			**Yes**	

Table 2: On-site car parking requirements and provision

Therefore, the subject development (having a total GFA of 371.84m^2) requires the provision of four (4) car parking spaces.

The proposed on-site car parking area provides four (4) on-site car parking spaces, including 1 accessible parking space with an adjacent shared area, on ground level. Bicycle storage spaces for staff are to be provided on-site.

The proposed development also provides for one (1) dedicated loading and unloading area on ground level, which can accommodate up to a Small Rigid Vehicle (SRV – 6.4 metres in length).

Therefore, the proposed on-site parking and loading provision is adequate for the development and in accordance with Council's requirements.

4.4 On-site Parking Layout and Circulation

The layout of the on-site car parking area and manoeuvring arrangements has been designed to enhance vehicular access, through the provision of adequate internal traffic aisle widths and turning space.

AS2890.1:2004 Parking facilities Part 1: Off-street car parking requires a minimum parking space width of 2.4 meters and a minimum length of 5.4 meters. The proposed on-site car parking spaces have a minimum width of 2.4 metres and a length of 5.4 meters each, which is adequate.

The accessible car parking space has a width of 2.7 metres, in addition to adjacent 2.4 metres wide shared zone, which is adequate in accordance with AS2890.6:2009 (and the updated AS2890.6:2022).

Car parking spaces adjacent to walls or obstructions have been made wider than the minimum width, to accommodate full door opening in accordance with Clause 2.4.2(d) of AS2890.1:2004.

Clause 2.4.2 of AS2890.1:2004 requires a minimum aisle width of 6.1 metres for two-way, one-sided aisles. The proposed internal aisles have a minimum width of 6.8 metres, which is adequate for two-way traffic and for vehicles to manoeuvre into and out of the parking spaces.

The existing internal right of carriageway has a clear width of 3.6 metres, which is adequate.

A minimum 2.2 metres headroom clearance is to be provided within the enclosed car space towards the rear of the site, in accordance with Clause 5.3.1 of AS2890.1:2004.

The largest size vehicle to access the subject site is a Small Rigid Vehicle (SRV 6.4 metres in length). A minimum 3.5 metres headroom clearance is to be provided from the ground level to the underside of the truck loading area, in accordance with AS2890.2:2018.

All vehicular manoeuvring within the site have been designed and checked using the SRV, B99 and B85 swept paths in accordance with AS2890.1:2004 and AS2890.2:2018. Refer to the vehicle swept paths diagrams attached in *Appendix 'B'* of this report.

Therefore, the on-site parking layout, vehicular manoeuvring and circulation arrangements are adequate for the proposed development and in compliance with AS2890.1:2004, AS2890.2:2018 and AS2890.6:2009 (and the updated AS2890.6:2022), where vehicles enter and exit the site in a forward direction at all times.

5 ON-STREET PARKING PROVISION

5.1 Existing Parking Controls

The subject site is located in a mixed industrial and commercial area, where unrestricted kerbside parking is available along both sides of Warren Avenue.

5.2 Impacts of Proposed Development on Parking

The parking demand resulting from the proposed industrial development can be accommodated within the proposed adequate and compliant on-site car parking, and loading/unloading facilities. **Therefore, the proposed development will not have adverse impacts on parking in the surrounding area.**

6 EXTERNAL TRAFFIC IMPACT

6.1 Estimated Future Traffic Generation

An indication of the potential traffic generation of the proposed development is provided by the **"*TfNSW Guide to Transport Impact Assessment - 2024*",** which specifies the following traffic generation rates for **large format warehousing**:

- *AM peak hour = 0.5 vehicle trips per 100m^2 GFA.*

The total proposed gross floor area of the warehouse units and associated facilities is 301.62m^2. An application of those typical rates to the proposed development would indicate a peak hour traffic generation of **2 vehicle trips per peak hour**.

In addition, the Guide also specifies the following traffic generation rates for **office areas**:

- *AM peak hour = 1.69 vehicle trips per 100m^2 GFA.*
- *PM peak hour = 1.20 vehicle trips per 100m^2 GFA.*

The total proposed gross floor area of the office spaces is 70.22m^2. An application of those typical rates to the proposed development would indicate an AM peak hour traffic generation of **2 vehicle trips per peak hour** and a PM peak hour traffic generation of **1 vehicle trips per peak hour**.

The total peak hour traffic generation for the subject development site:

- ***AM peak hour = 4 vehicle trips hour.***
- ***PM peak hour = 3 vehicle trips per hour****.*

6.2 Projected Intersection Performance (post-development)

Average Vehicle Delay (AVD) and Level of Service (LOS) – The AVD and LOS provides a measure of the operational performance of an intersection, as indicated in Table 4.2 of the Roads & Maritime Services "*Guide to Traffic Generating Developments - 2002*" (shown below).

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

Table 4.2: Level of Service Criteria for intersections (RMS Guide)

A **post-development** SIDRA intersection performance modelling analysis was undertaken for the intersection of Warren Avenue / Canterbury Road, in the vicinity of the subject site, and it was modelled as the proposed layout as shown in Figure 5 below.

Refer to the summary of the results of the SIDRA intersection performance analysis (undertaken for pre & post development, including the 10-year future growth) attached in *Appendix 'C'* of this report.

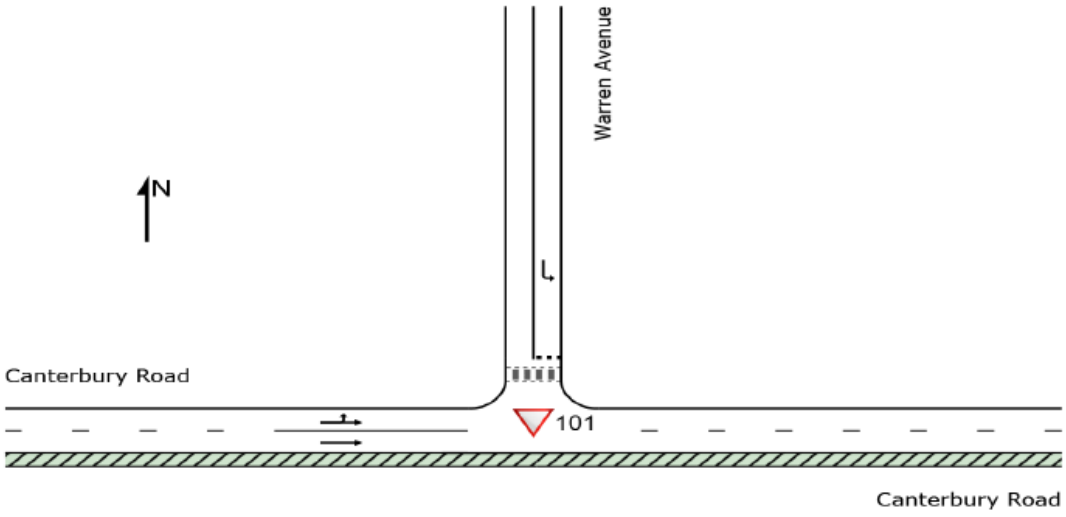


Figure 5: Intersection Layout

The following assumptions have been considered and adopted in the SIDRA Network Intersection modelling for the post-development conditions considering that the main access to and from the subject site is through Warren Avenue:

- Morning and afternoon peak traffic generation from *RMS Guide to Traffic Generating Developments* has been used, as outlined in Section 6.1 of this report.
- AM & PM Traffic generated by the development was equally adopted for inbound and outbound traffic.
- Pre-development network analysis is modelled for the base year (2024) and 10 years of future growth (2034) in surrounding traffic. The annual traffic growth rate for the 10-year future period was based on the SIDRA intersection analysis software, which allows for future analysis of surrounding traffic by applying a uniform growth rate of 2% for each year over the 10-year period.
- Post-development network analysis is modelled for when the industrial development is in operation and after 10 years of future growth in surrounding traffic.
- The generated traffic volume split from the development at the subject-modelled intersection was assigned based on the current traffic condition, existing traffic network restrictions, and driver behaviour.

These assumptions will result in the development trip distribution shown in Figures 6 and 7 for relevant traffic movement and modelled intersection.

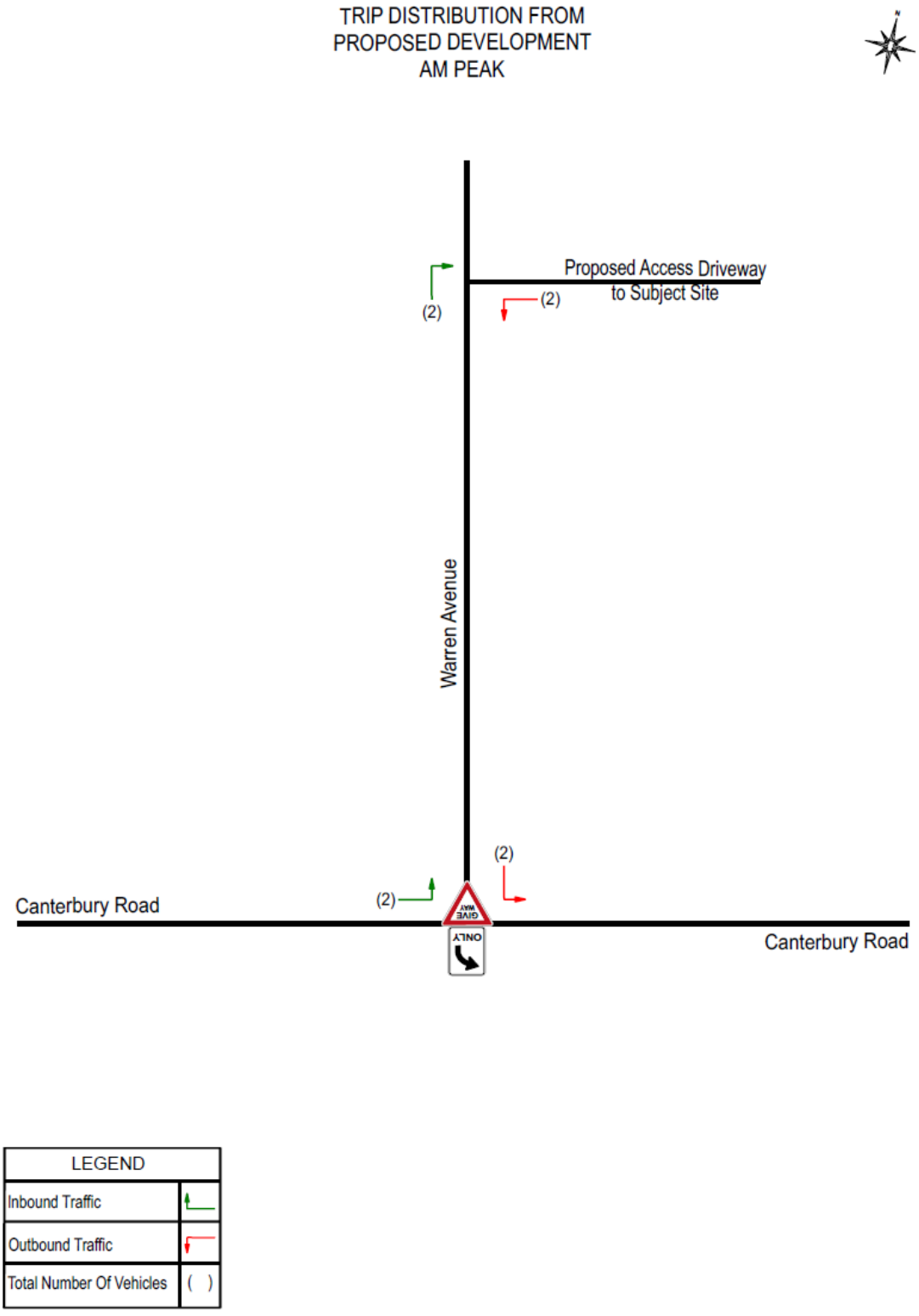


Figure 6: Development Traffic Distribution on the Surrounding Road Network – **AM Peak**

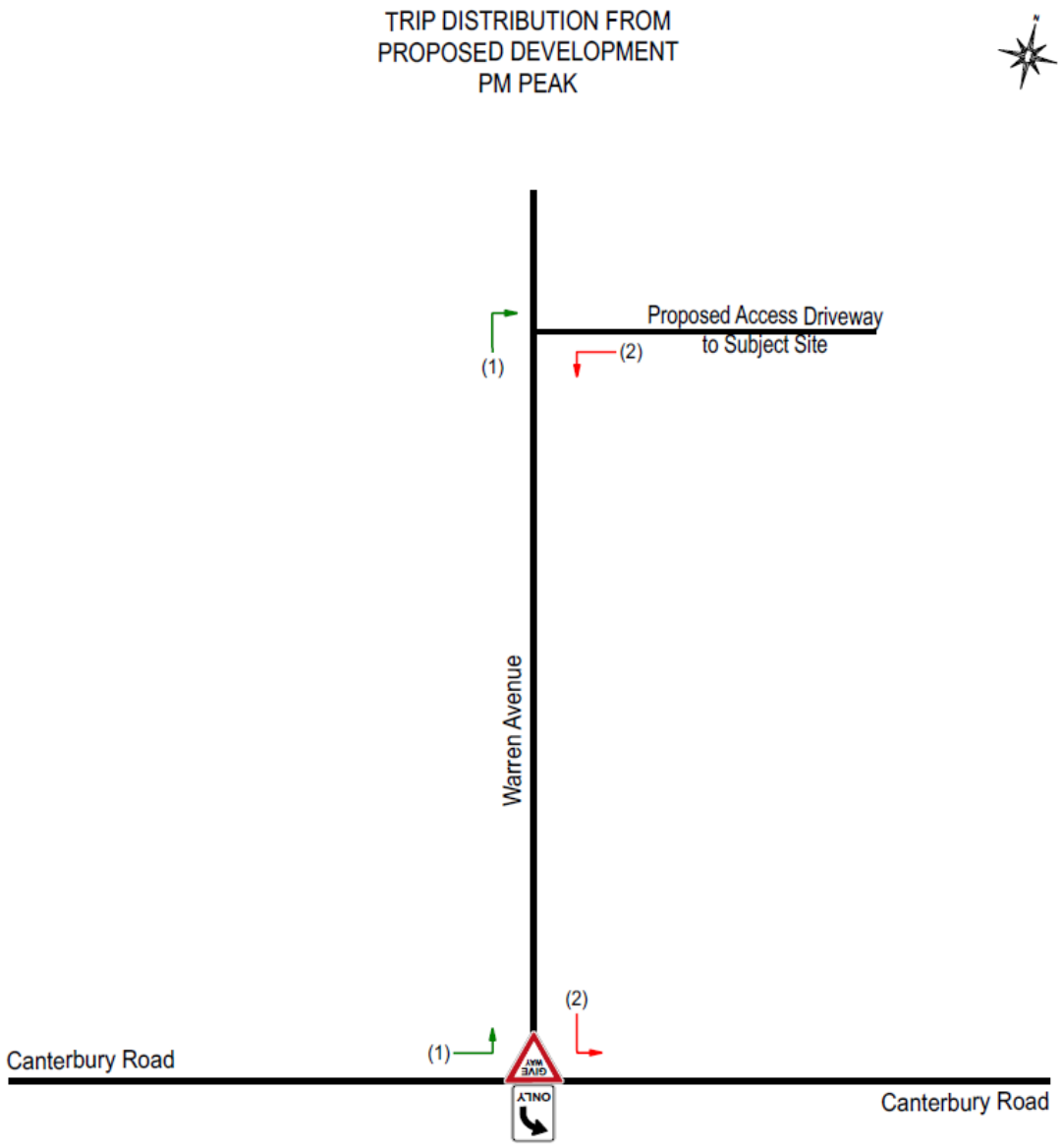


Figure 7: Development Traffic Distribution on the Surrounding Road Network – **PM Peak**

The outcome of the SIDRA modelling

A summary of the results of the SIDRA intersection performance analysis has been provided in Tables 3 and 4 below, as well as the SIDRA Movement Summary Tables attached in *Appendix 'C'* of this report.

Modelled Peak	Average LOS	Average Delay (sec)	DOS (Veh/C)
Base Year 2024 – Pre-Development	A	0.0	0.429
Base Year 2024 – Post Development	A	0.1	0.429
Future Year 2034 – Pre-Development	A	0.1	0.515
Future Year 2034 – Post Development	A	0.1	0.515

Table 3: Network SIDRA Modelling – Warren Ave / Canterbury Rd – 7.15am – 8.15am

Modelled Peak	Average LOS	Average Delay (sec)	DOS (Veh/C)
Base Year 2024 – Pre-Development	A	0.1	0.461
Base Year 2024 – Post Development	A	0.1	0.462
Future Year 2034 – Pre-Development	A	0.1	0.553
Future Year 2034 – Post Development	A	0.1	0.554

Table 4: Network SIDRA Modelling – Warren Ave / Canterbury Rd – 3.00pm – 4.00pm

The SIDRA analysis results indicate that the proposed development will have minimal impact on the operational performance of key intersections in the study area, both in the base year and the 10-year future scenario.

Base Year findings:

- The proposed industrial development (**post-development**) will not alter the current LOS (pre-development) at the subject intersection of Warren Avenue / Canterbury Road as outlined earlier in Section 3.3 of this report, and will continue to operate at its current levels of service during weekday AM and PM peak period.

Future Year findings:

- In the 10-year scenario **without development**, the subject intersection of Warren Avenue / Canterbury Road is predicted to continue to operate at an overall LOS 'A', during the AM and PM peak periods.
- The **proposed development** is not expected to alter these future LOS outcomes, with intersections maintaining the same levels of service as projected in the pre-development scenario.

Therefore, the estimated traffic generation from the proposed development is of low impact on existing flows on Warren Avenue and surrounding streets and will not have adverse impacts on the current operational performance of the subject existing intersection, which will continue to operate at the same levels of service.

7 CONCLUSION

It can be concluded from the traffic and parking impact assessment that the proposed industrial warehouse development at **5 Warren Avenue, Bankstown**, will not have adverse impacts on existing traffic or parking conditions and is worthy of Council's support in its present form.

- The existing traffic flows on Warren Avenue and Canterbury Road are appropriate for a local road and a state road, respectively, in a mixed industrial and commercial area, where traffic in Warren Avenue is free flowing without major queuing or delays near the subject site in peak hours, with spare capacity.

- The estimated traffic generation from the proposed industrial development is of low impact on existing flows on Warren Avenue and surrounding streets and will not have adverse impacts on the current operational performance of the subject existing intersection, which will continue to operate at the same levels of service. The traffic generated by the proposed development can be readily accommodated within the existing road network.

- The potential increase in the number of vehicle movements in and about Warren Avenue and adjacent streets will not have adverse impacts on the amenity of the area.

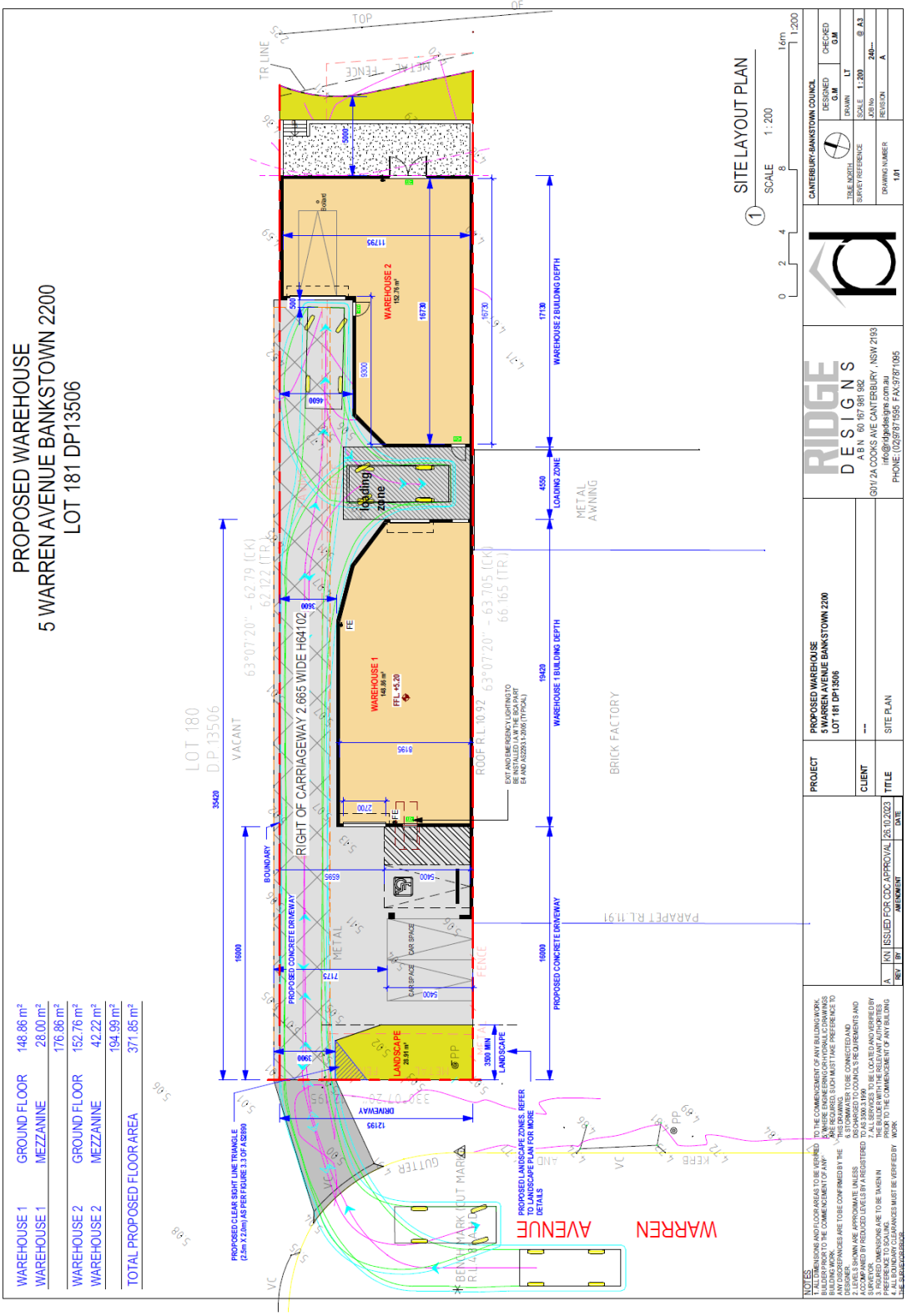
- The parking demand resulting from the proposed industrial development can be easily accommodated within the proposed adequate and compliant on-site parking spaces and loading/unloading facilities.

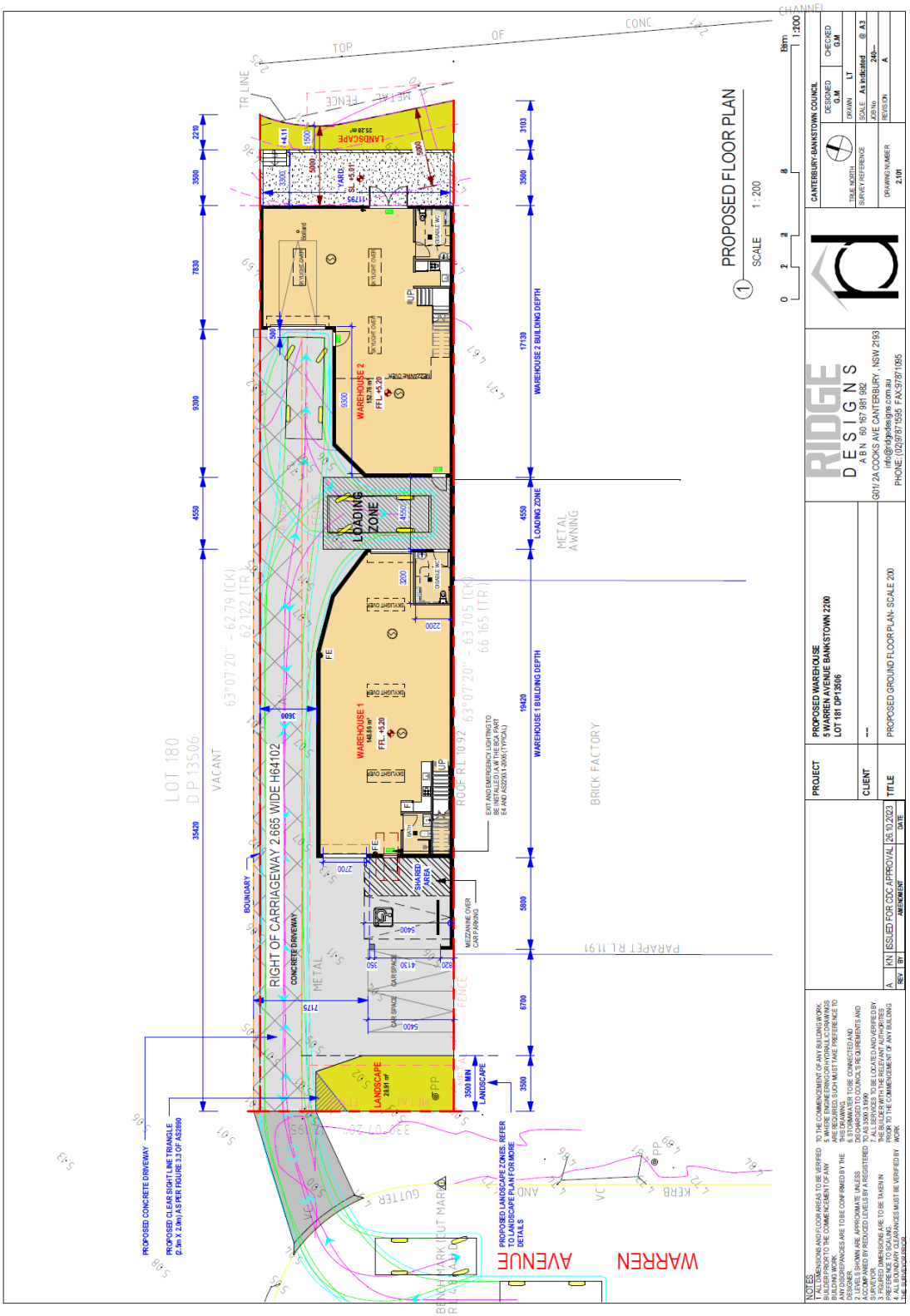
- The on-site vehicular access, car parking layout and vehicular circulation is adequate for the proposed development and in accordance with AS2890.1:2004, AS2890.2:2018 and AS2890.6:2009 (and the updated AS2890.6:2022), where vehicles enter and exit the site in a forward direction at all times.

- The subject development site has good access to existing public transportation services.

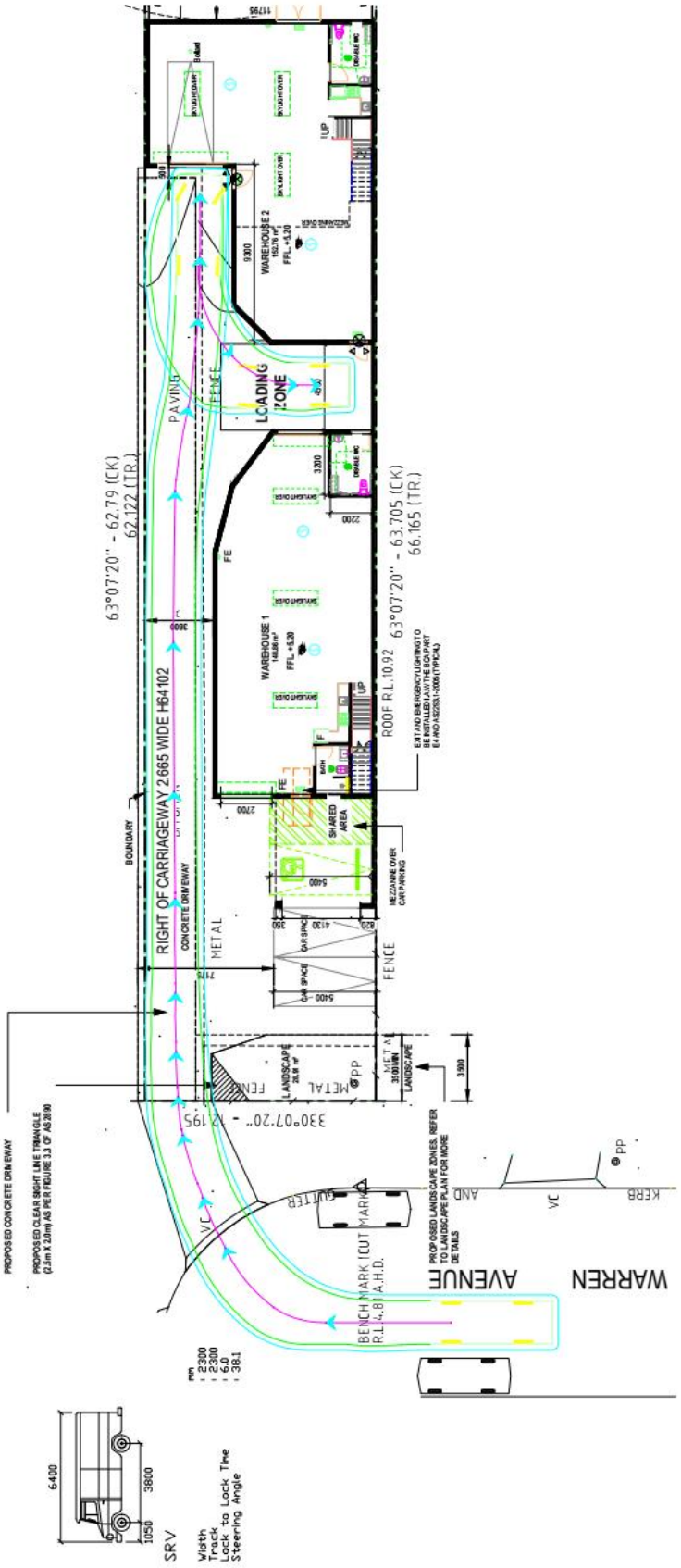
- The proposed development will not have adverse impacts on parking in the surrounding area.

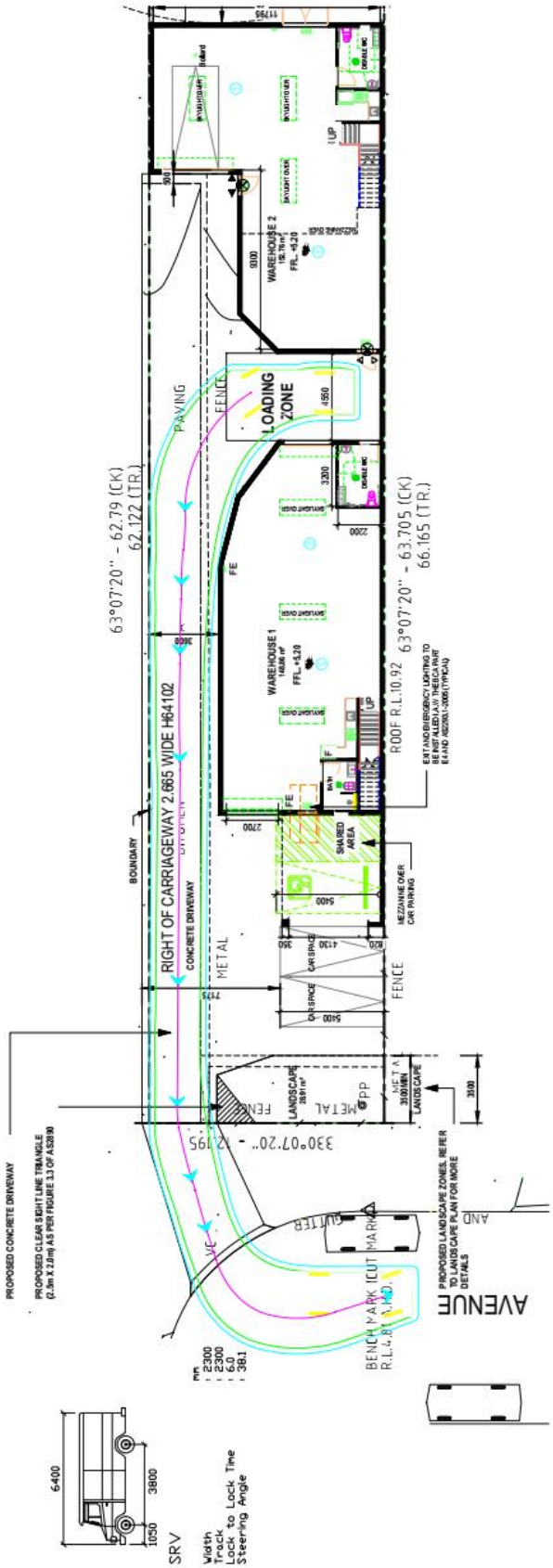
Appendix A – Proposed Development Plans

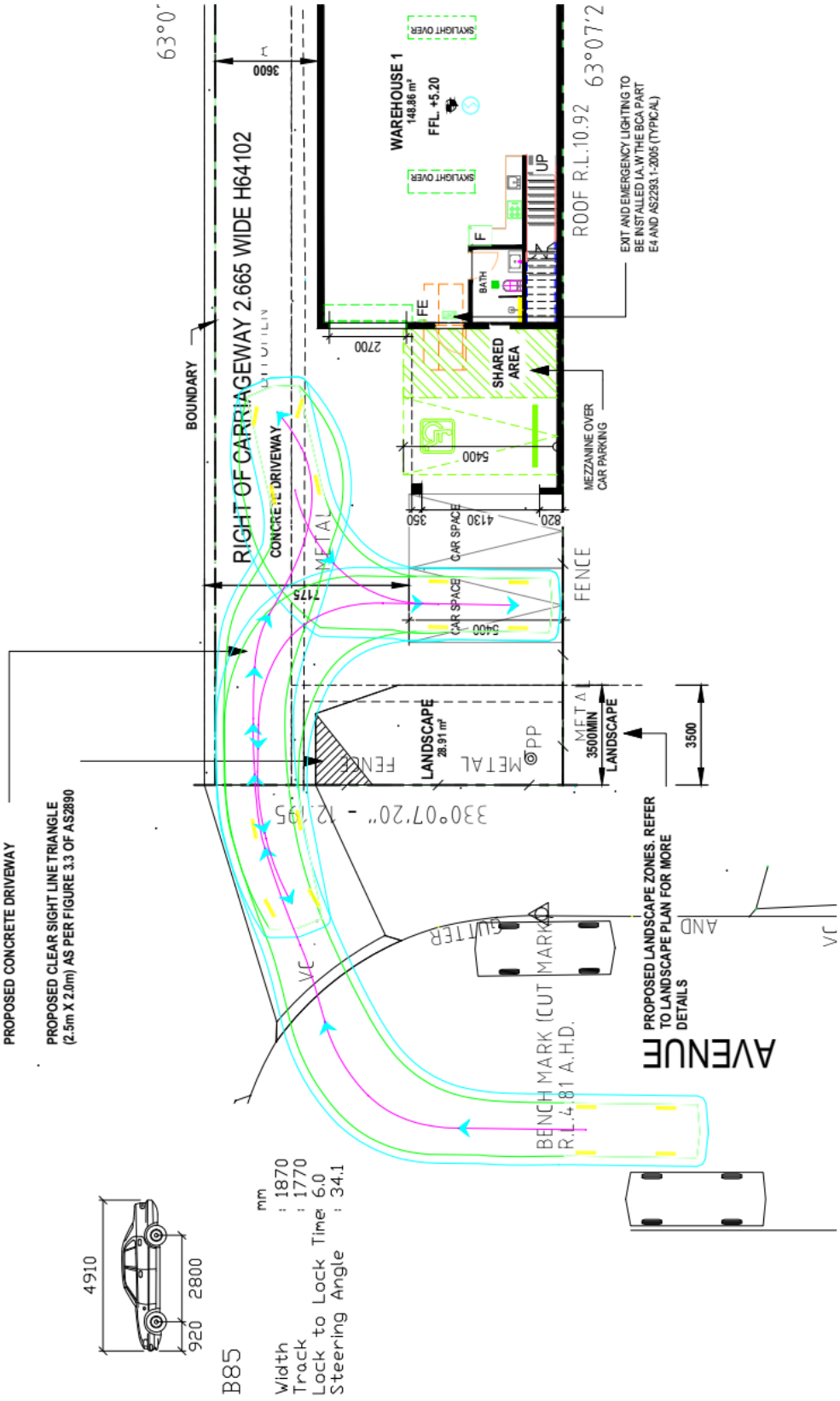

PROPOSED WAREHOUSE
5 WARREN AVENUE BANKSTOWN 2200
LOT 181 DP13506
SITE LAYOUT PLAN
SCALE 1:200
WAREHOUSE 1 GROUND FLOOR 148.86 m²
WAREHOUSE 1 MEZZANINE 28.00 m²
176.86 m²
WAREHOUSE 2 GROUND FLOOR 152.76 m²
WAREHOUSE 2 MEZZANINE 42.22 m²
194.99 m²
TOTAL PROPOSED FLOOR AREA 371.85 m²
WAREHOUSE 1
WAREHOUSE 2
RIGHT OF CARRIAGEWAY 2.665 WIDE H64102
PROPOSED CONCRETE DRIVEWAY
LANDSCAPE
LOADING ZONE
BRICK FACTORY
VACANT
LOT 180 D.P.13506
WARREN AVENUE
PROPOSED CLEAR SIGHT LINE TRIANGLE (2.5m X 2.0m) AS PER FIGURE 3.3 OF AS2890
PROPOSED LANDSCAPE ZONES. REFER TO LANDSCAPE PLAN FOR MORE DETAILS
RIDGE DESIGNS
ABN 60 167 981 982
G01/ 2A COOKS AVE CANTERBURY, NSW 2193
info@ridgedesigns.com.au
PHONE: (02)97871695 FAX:97871695
CANTERBURY-BANKSTOWN COUNCIL
PROJECT
PROPOSED WAREHOUSE
5 WARREN AVENUE BANKSTOWN 2200
LOT 181 DP13506
CLIENT
TITLE
SITE PLAN
DESIGNED G.M
DRAWN LT
CHECKED G.M
SCALE 1:200 @ A3
JOB No 240---
DRAWING NUMBER 1.01
REVISION A
A KN ISSUED FOR CDC APPROVAL 26.10.2023
NOTES

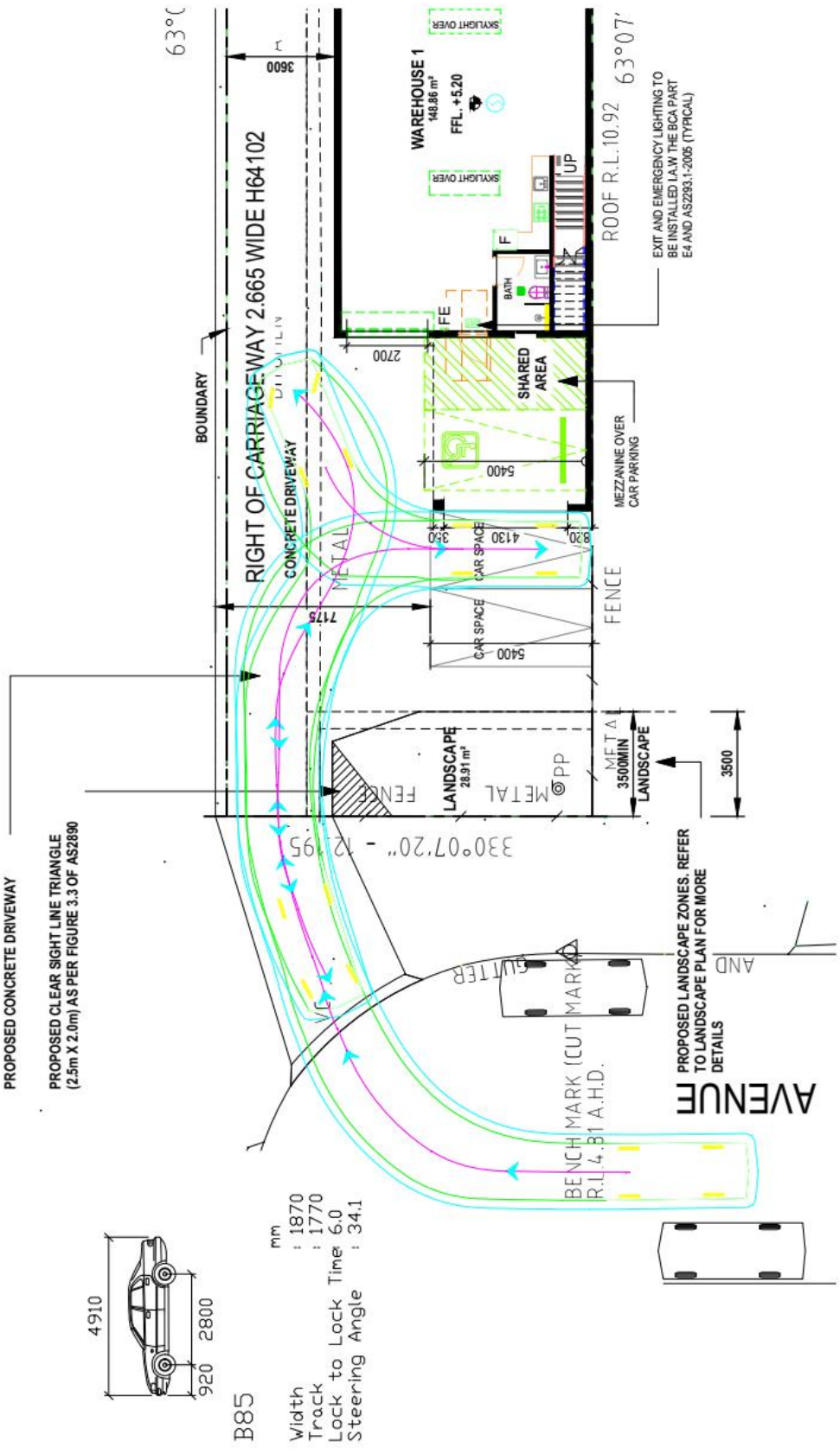

PROPOSED FLOOR PLAN
SCALE 1:200
PROPOSED GROUND FLOOR PLAN- SCALE 200
PROPOSED WAREHOUSE
5 WARREN AVENUE BANKSTOWN 2200
LOT 181 DP13506
RIDGE DESIGNS
ABN 60 167 981 982
G01/ 2A COOKS AVE CANTERBURY , NSW 2193
info@ridgedesigns.com.au
PHONE: (02)97871595 FAX:97871095
CANTERBURY-BANKSTOWN COUNCIL
WAREHOUSE 1
WAREHOUSE 2
LOADING ZONE
RIGHT OF CARRIAGEWAY 2.665 WIDE H64102
CONCRETE DRIVEWAY
BOUNDARY
LOT 180 D.P.13506
VACANT
BRICK FACTORY
METAL AWNING
WARREN AVENUE
PROPOSED CONCRETE DRIVEWAY
PROPOSED LANDSCAPE ZONES. REFER TO LANDSCAPE PLAN FOR MORE DETAILS
ISSUED FOR CDC APPROVAL
26.10.2023

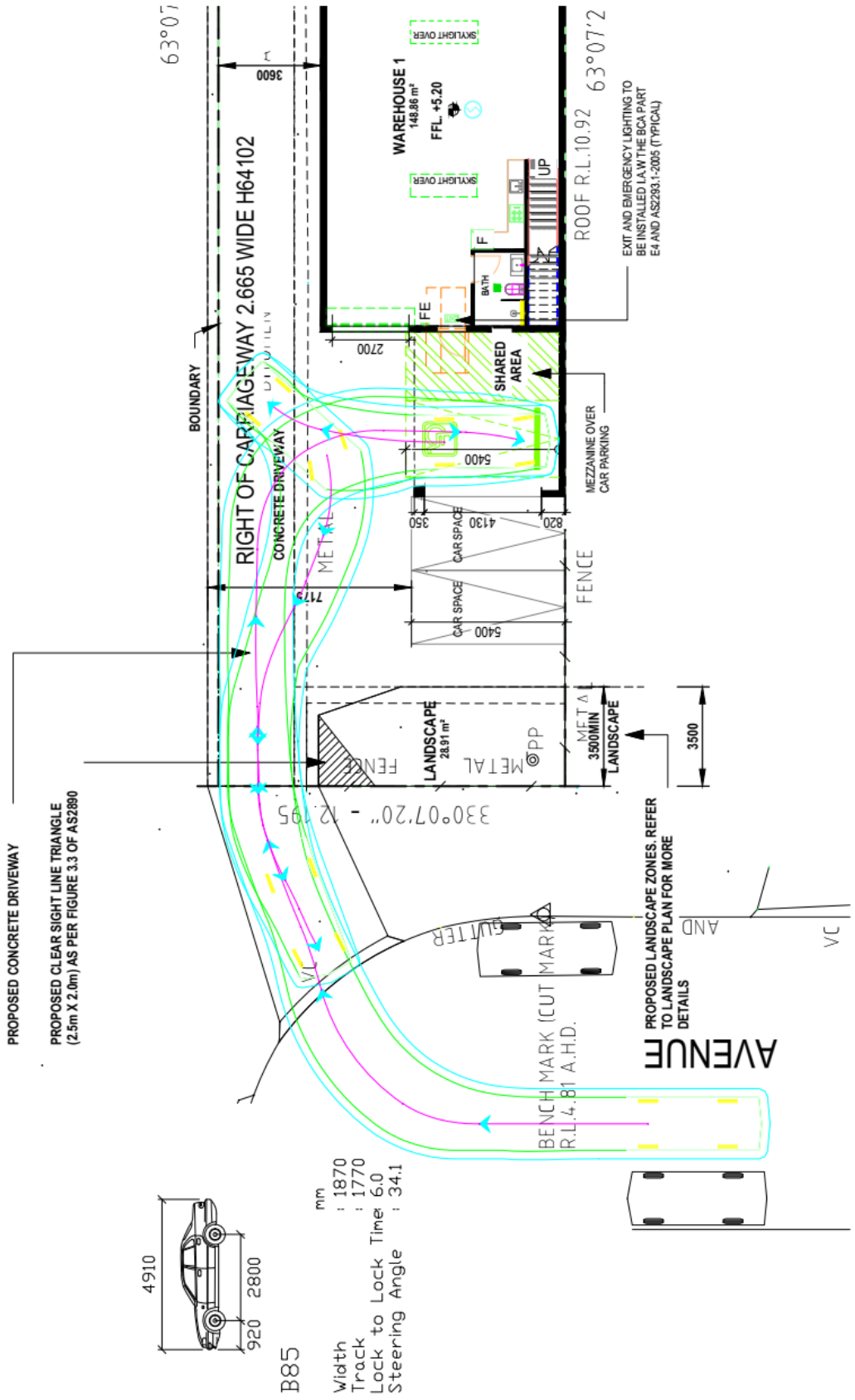
Appendix B – Vehicle Swept Paths

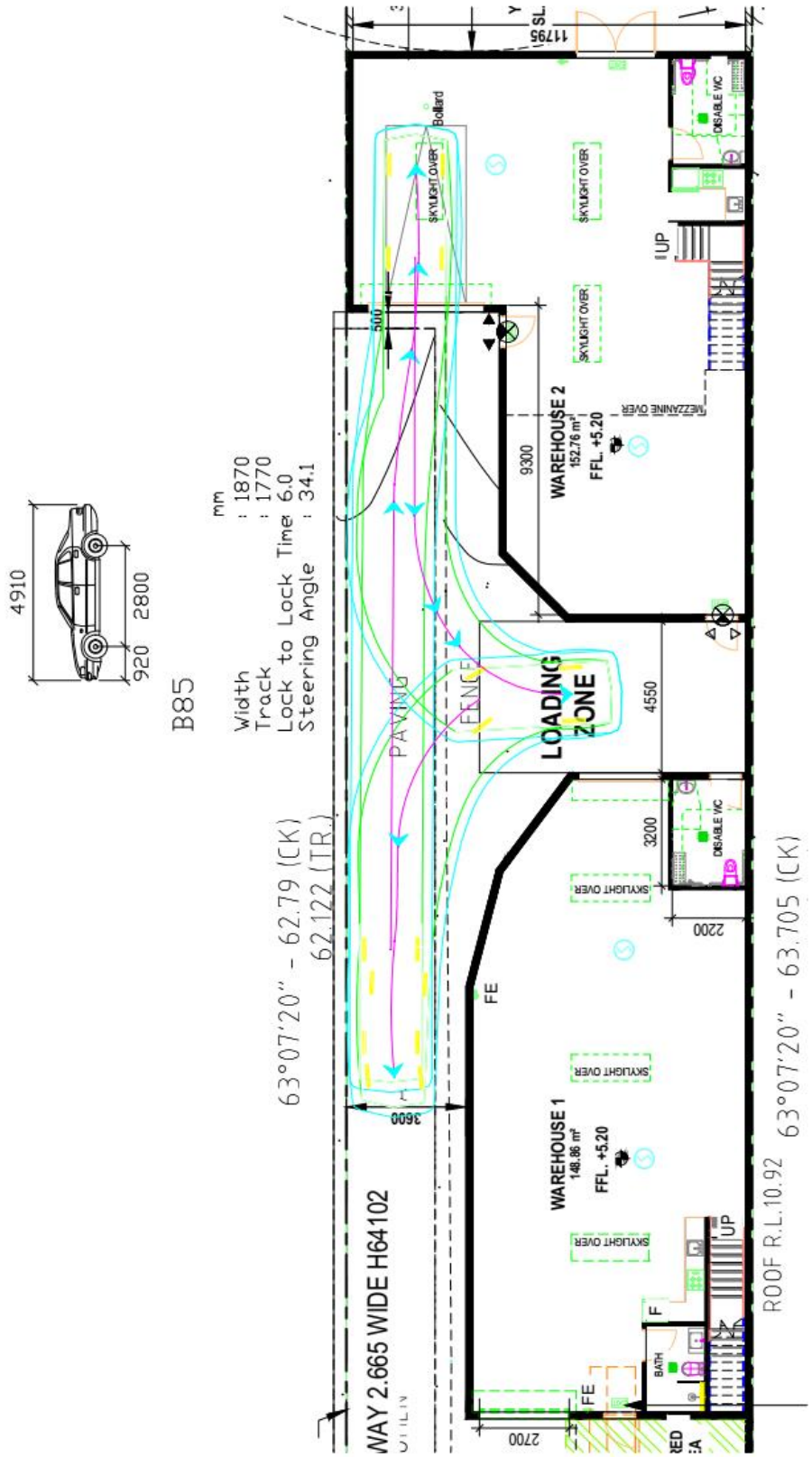

WAREHOUSE 2
WAREHOUSE 1
LOADING ZONE
PAVING
FENCE
RIGHT OF CARRIAGEWAY 2.665 WIDE H64102
CONCRETE DRIVEWAY
BOUNDARY
SHARED AREA
METAL
63°07'20" - 62.79 (CK)
62.122 (TR.)
63°07'20" - 63.705 (CK)
66.165 (TR.)
ROOF R.L.10.92
330°07'20" - 12.195
PROPOSED CONCRETE DRIVEWAY
PROPOSED CLEAR SIGHT LINE TRIANGLE
(2.5m X 2.0m) AS PER FIGURE 3.3 OF AS 2890
PROPOSED LANDSCAPE ZONES. REFER TO LANDSCAPE PLAN FOR MORE DETAILS
BENCH MARK (CUT MARK)
R.L.4.8 A.H.D.
WARREN AVENUE
KERB
GUTTER
VC
PP
SRV
6400
3800
1050
Width
Track
Lock to Lock Time
Steering Angle
mm
2300
2300
6.0
38.1


RIGHT OF CARRIAGEWAY 2.665 WIDE H64102
CONCRETE DRIVEWAY
LOADING ZONE
WAREHOUSE 2
WAREHOUSE 1
PAVING
FENCE
METAL
BOUNDARY
63°07'20" - 62.79 (CK)
62.122 (TR.)
63°07'20" - 63.705 (CK)
66.165 (TR.)
ROOF R.L.10.92
MEZZANINE OVER CAR PARKING
LANDSCAPE
PROPOSED CONCRETE DRIVEWAY
PROPOSED CLEAR SIGHT LINE TRIANGLE (2.5m X 2.0m) AS PER FIGURE 3.3 OF AS2890
PROPOSED LANDSCAPE ZONES. REFER TO LANDSCAPE PLAN FOR MORE DETAILS
AVENUE
BENCH MARK ICUT
SRV
Width
Track
Lock to Lock Time
Steering Angle
6400
3800
2300
2300
6.0
38.1


RIGHT OF CARRIAGEWAY 2.665 WIDE H64102
BOUNDARY
CONCRETE DRIVEWAY
WAREHOUSE 1
148.86 m²
FFL. +5.20
ROOF R.L.10.92
SHARED AREA
MEZZANINE OVER CAR PARKING
CAR SPACE
CAR SPACE
FENCE
LANDSCAPE
28.91 m²
LANDSCAPE
3500MIN
3500
PROPOSED CONCRETE DRIVEWAY
PROPOSED CLEAR SIGHT LINE TRIANGLE (2.5m X 2.0m) AS PER FIGURE 3.3 OF AS2890
PROPOSED LANDSCAPE ZONES. REFER TO LANDSCAPE PLAN FOR MORE DETAILS
AVENUE
BENCH MARK (CUT MARK)
R.L.4.81 A.H.D.
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
4910
2800
920


RIGHT OF CARRIAGEWAY 2.665 WIDE H64102
BOUNDARY
CONCRETE DRIVEWAY
WAREHOUSE 1
148.86 m²
FFL. +5.20
SKYLIGHT OVER
SKYLIGHT OVER
UP
F
BATH
FFE
ROOF R.L.10.92
EXIT AND EMERGENCY LIGHTING TO BE INSTALLED I.A.W THE BCA PART E4 AND AS2293.1-2005 (TYPICAL)
SHARED AREA
MEZZANINE OVER CAR PARKING
CAR SPACE
CAR SPACE
METAL
FENCE
LANDSCAPE
28.91 m²
3500MIN LANDSCAPE
3500
PROPOSED CONCRETE DRIVEWAY
PROPOSED CLEAR SIGHT LINE TRIANGLE (2.5m X 2.0m) AS PER FIGURE 3.3 OF AS2890
PROPOSED LANDSCAPE ZONES. REFER TO LANDSCAPE PLAN FOR MORE DETAILS
BENCH MARK (CUT MARK)
R.L 4.31 A.H.D.
AVENUE
B85
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
4910
2800
920


RIGHT OF CARRIAGEWAY 2.665 WIDE H64102
BOUNDARY
CONCRETE DRIVEWAY
WAREHOUSE 1
148.86 m²
FFL. +5.20
SKYLIGHT OVER
SKYLIGHT OVER
ROOF R.L.10.92
EXIT AND EMERGENCY LIGHTING TO BE INSTALLED I.A.W THE BCA PART E4 AND AS2293.1-2005 (TYPICAL)
SHARED AREA
MEZZANINE OVER CAR PARKING
FE
BATH
UP
F
2700
5400
350
4130
820
CAR SPACE
CAR SPACE
5400
FENCE
METAL
LANDSCAPE
28.91 m²
FENCE
METAL
3500MIN
LANDSCAPE
3500
3600
PROPOSED CONCRETE DRIVEWAY
PROPOSED CLEAR SIGHT LINE TRIANGLE (2.5m X 2.0m) AS PER FIGURE 3.3 OF AS2890
PROPOSED LANDSCAPE ZONES. REFER TO LANDSCAPE PLAN FOR MORE DETAILS
AVENUE
BENCH MARK (CUT MARK)
R.L.4.81 A.H.D.
4910
2800
920
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1


4910
2800
920
B85
mm
Width : 1870
Track : 1770
Lock to Lock Time 6.0
Steering Angle : 34.1
63°07'20" - 62.79 (CK)
62.122 (TR.)
63°07'20" - 63.705 (CK)
ROOF R.L.10.92
WAY 2.665 WIDE H64102
PAVING
FENCE
LOADING ZONE
WAREHOUSE 2
152.76 m²
FFL. +5.20
WAREHOUSE 1
148.86 m²
FFL. +5.20
SKYLIGHT OVER
MEZZANINE OVER
DISABLE WC
BATH
UP
FE
Bollard
9300
4550
3200
2200
3600
2700
500

Appendix C – SIDRA Intersection Analysis

MOVEMENT SUMMARY – 7.15am – 8.15am – Base Year 2024 – Warren Avenue / Canterbury Road

Pre-Development

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Warren Avenue															
7	L2	All MCs	1	5.0	1	5.0	0.002	9.2	LOS A	0.0	0.0	0.62	0.64	0.62	29.0
Approach			1	5.0	1	5.0	0.002	9.2	LOS A	0.0	0.0	0.62	0.64	0.62	29.0
West: Canterbury Road															
10	L2	All MCs	3	5.0	3	5.0	0.429	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	31.1
11	T1	All MCs	1617	5.0	1617	5.0	0.429	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach			1620	5.0	1620	5.0	0.429	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.5
All Vehicles			1621	5.0	1621	5.0	0.429	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.5

Post-Development

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Warren Avenue															
7	L2	All MCs	3	1.7	3	1.7	0.005	9.0	LOS A	0.0	0.1	0.61	0.68	0.61	29.5
Approach			3	1.7	3	1.7	0.005	9.0	LOS A	0.0	0.1	0.61	0.68	0.61	29.5
West: Canterbury Road															
10	L2	All MCs	5	3.0	5	3.0	0.429	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	31.2
11	T1	All MCs	1617	5.0	1617	5.0	0.429	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach			1622	5.0	1622	5.0	0.429	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.5
All Vehicles			1625	5.0	1625	5.0	0.429	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.3

MOVEMENT SUMMARY – 3.00pm – 4.00pm – Base Year 2024 – Warren Avenue / Canterbury Road

Pre-Development

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Warren Avenue															
7	L2	All MCs	3	5.0	3	5.0	0.006	10.1	LOS A	0.0	0.1	0.66	0.72	0.66	28.0
Approach			3	5.0	3	5.0	0.006	10.1	LOS A	0.0	0.1	0.66	0.72	0.66	28.0
West: Canterbury Road															
10	L2	All MCs	2	5.0	2	5.0	0.461	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	31.1
11	T1	All MCs	1740	5.0	1740	5.0	0.461	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach			1742	5.0	1742	5.0	0.461	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.6
All Vehicles			1745	5.0	1745	5.0	0.461	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.4

Post-Development

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h	HV] %	Arrival Flows [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh	Dist] m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Warren Avenue															
7	L2	All MCs	5	3.0	5	3.0	0.010	9.9	LOS A	0.0	0.2	0.66	0.74	0.66	28.3
Approach			5	3.0	5	3.0	0.010	9.9	LOS A	0.0	0.2	0.66	0.74	0.66	28.3
West: Canterbury Road															
10	L2	All MCs	3	3.3	3	3.3	0.462	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	31.2
11	T1	All MCs	1740	5.0	1740	5.0	0.462	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach			1743	5.0	1743	5.0	0.462	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.5
All Vehicles			1748	5.0	1748	5.0	0.462	0.1	NA	0.0	0.2	0.00	0.00	0.00	59.3

MOVEMENT SUMMARY – 7.15am – 8.15am – Future Year 2034 – Warren Avenue / Canterbury Road

Pre-Development

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	HV %	Arrival Flows [Total veh/h]	HV %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh]	Dist m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Warren Avenue															
7	L2	All MCs	1	5.0	1	5.0	0.003	11.6	LOS A	0.0	0.1	0.72	0.71	0.72	26.3
Approach			1	5.0	1	5.0	0.003	11.6	LOS A	0.0	0.1	0.72	0.71	0.72	26.3
West: Canterbury Road															
10	L2	All MCs	4	5.0	4	5.0	0.515	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	31.1
11	T1	All MCs	1940	5.0	1940	5.0	0.515	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach			1944	5.0	1944	5.0	0.515	0.0	NA	0.0	0.0	0.00	0.00	0.00	59.4
All Vehicles			1945	5.0	1945	5.0	0.515	0.1	NA	0.0	0.1	0.00	0.00	0.00	59.4

Post-Development

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	HV %	Arrival Flows [Total veh/h]	HV %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh]	Dist m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Warren Avenue															
7	L2	All MCs	4	1.7	4	1.7	0.008	11.2	LOS A	0.0	0.2	0.71	0.77	0.71	26.9
Approach			4	1.7	4	1.7	0.008	11.2	LOS A	0.0	0.2	0.71	0.77	0.71	26.9
West: Canterbury Road															
10	L2	All MCs	6	3.0	6	3.0	0.515	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	31.1
11	T1	All MCs	1940	5.0	1940	5.0	0.515	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach			1947	5.0	1947	5.0	0.515	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.3
All Vehicles			1950	5.0	1950	5.0	0.515	0.1	NA	0.0	0.2	0.00	0.00	0.00	59.2

MOVEMENT SUMMARY – 3.00pm – 4.00pm – Future Year 2034 – Warren Avenue / Canterbury Road

Pre-Development

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	HV %	Arrival Flows [Total veh/h]	HV %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh]	Dist m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Warren Avenue															
7	L2	All MCs	4	5.0	4	5.0	0.010	13.3	LOS A	0.0	0.2	0.76	0.82	0.76	24.7
Approach			4	5.0	4	5.0	0.010	13.3	LOS A	0.0	0.2	0.76	0.82	0.76	24.7
West: Canterbury Road															
10	L2	All MCs	3	5.0	3	5.0	0.563	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	31.1
11	T1	All MCs	2088	5.0	2088	5.0	0.563	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.5
Approach			2091	5.0	2091	5.0	0.563	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.4
All Vehicles			2094	5.0	2094	5.0	0.563	0.1	NA	0.0	0.2	0.00	0.00	0.00	59.3

Post-Development

Vehicle Movement Performance

Mov ID	Turn	Mov Class	Demand Flows [Total veh/h]	HV %	Arrival Flows [Total veh/h]	HV %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% Back Of Queue [Veh. veh]	Dist m	Prop. Que	Eff. Stop Rate	Aver. No. of Cycles	Aver. Speed km/h
North: Warren Avenue															
7	L2	All MCs	6	3.0	6	3.0	0.017	13.0	LOS A	0.1	0.4	0.76	0.85	0.76	25.1
Approach			6	3.0	6	3.0	0.017	13.0	LOS A	0.1	0.4	0.76	0.85	0.76	25.1
West: Canterbury Road															
10	L2	All MCs	4	3.3	4	3.3	0.554	5.2	LOS A	0.0	0.0	0.00	0.00	0.00	31.1
11	T1	All MCs	2088	5.0	2088	5.0	0.554	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	59.4
Approach			2092	5.0	2092	5.0	0.554	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.4
All Vehicles			2098	5.0	2098	5.0	0.554	0.1	NA	0.1	0.4	0.00	0.00	0.00	59.1