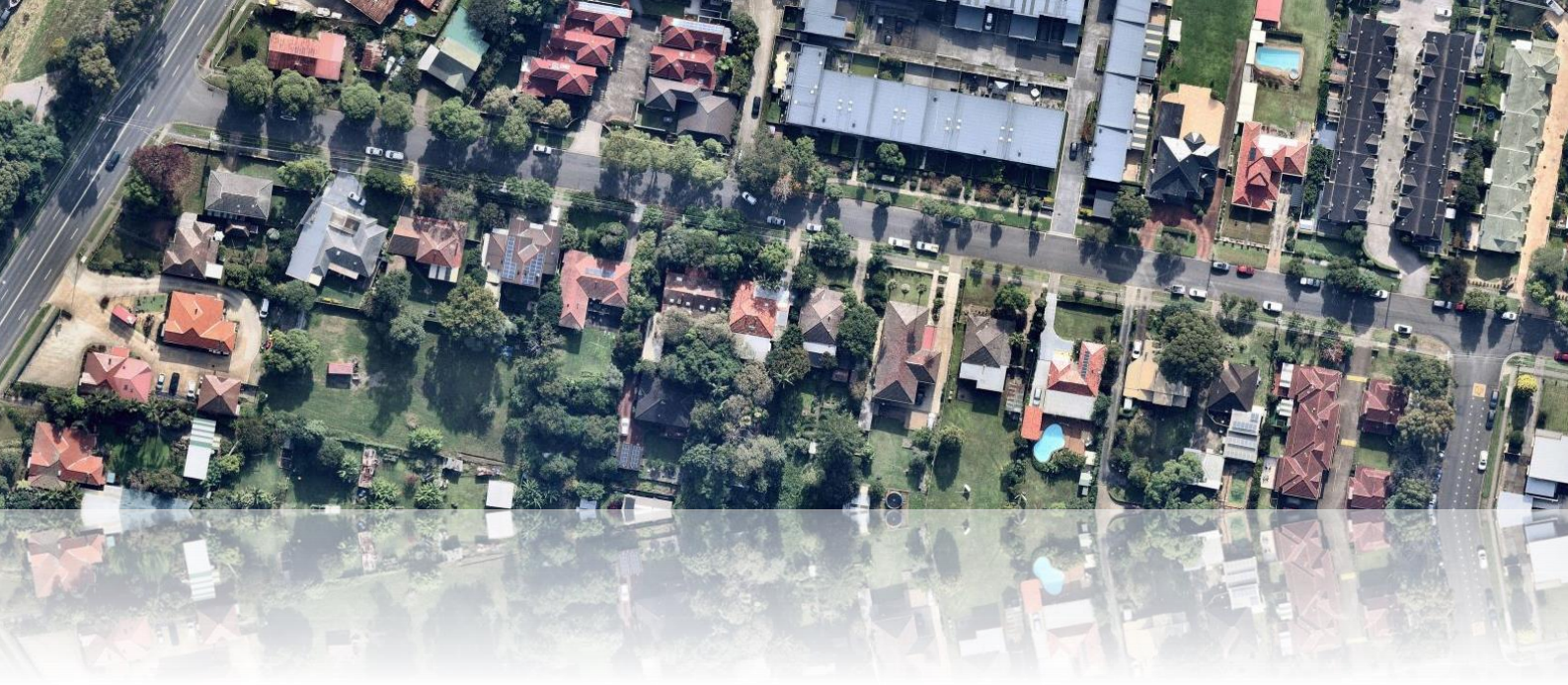


TRAFFIC AND PARKING IMPACT ASSESSMENT OF THE PROPOSED CHILD CARE CENTRE AT 14 WINDERMERE AVENUE, NORTHMEAD

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

Telephone: +61 2 9521 7199
Web: www.mclarentraffic.com.au
Email: admin@mclarentraffic.com.au

Division of RAMTRANS Australia ABN: 45067491678 RPEQ: 19457

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

220510.01FA - 10 November 2022

Development Type: **Child Care Centre**

Site Address: **14 Windermere Avenue, Northmead**

Prepared for: **Janssen Designs**

Document reference: **220510.01FA**

Status	Issue	Prepared By	Checked By	Date
Draft	A	JC	AT	10 November 2022
Final	A	AT		10 November 2022

TABLE OF CONTENTS

1 INTRODUCTION

M^CLaren Traffic Engineering was commissioned by *Janssen Designs* to provide a traffic and parking impact assessment of the proposed Child Care Centre at 14 Windermere Avenue, Northmead as depicted in **Annexure A**.

1.1 Description and Scale of Development

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

- A child care centre accommodating 88 children and 17 staff members as per the following:
    - 20 children between 0-2 years old (staff assigned at 1 per 4 children, or 5 staff);
    - 30 children between 2-3 years old (staff assigned at 1 per 5 children, or 6 staff);
    - 38 children between 3-6 years old (staff assigned at 1 per 10 children, or 4 staff);
    - Two (2) additional support staff.
- An at-grade car parking area with vehicular access via a proposed two-way driveway from Windermere Avenue, accommodating a total of 22 car spaces including:
    - 11 parent car parking spaces including one (1) accessible space;
    - 11 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 City of Parramatta Council officers accordingly.

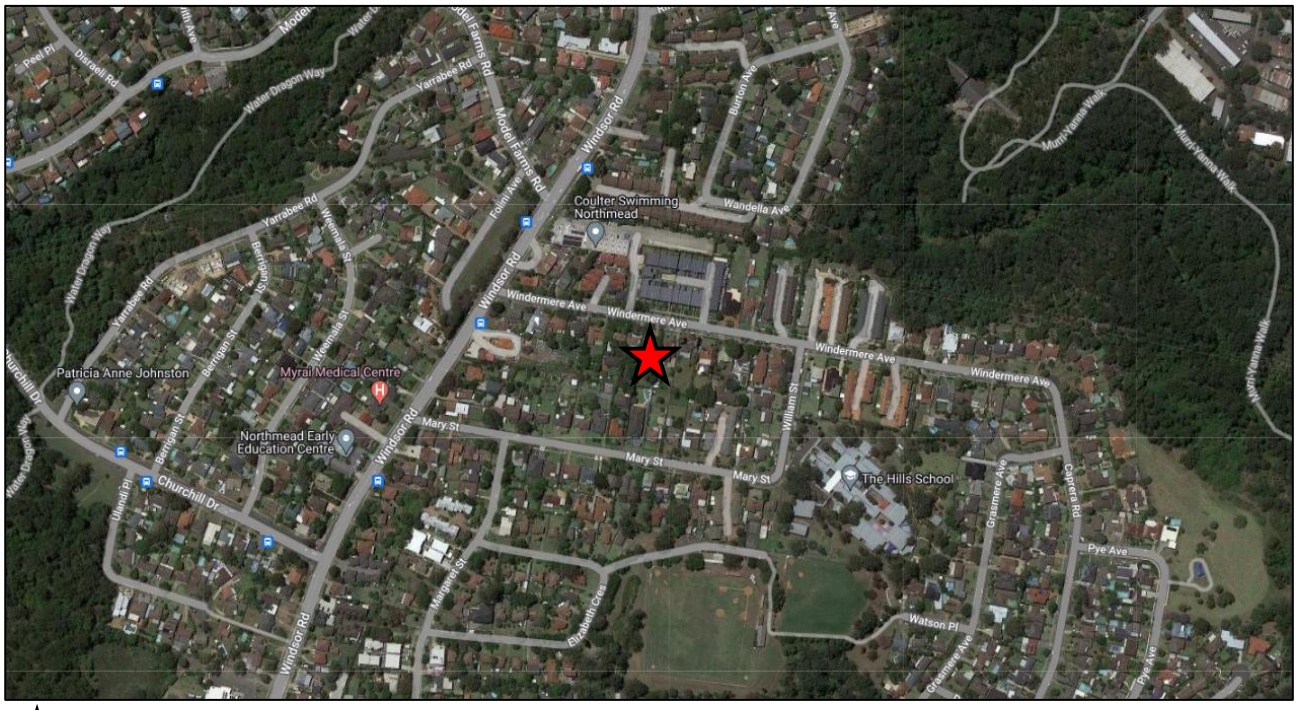
1.3 Site Description

The subject development is currently zoned *R2 – Low Density Residential* under the Parramatta (former The Hills) Council LEP 2012 and is currently occupied by a low-density dwelling. The site has a singular frontage to Windermere Avenue to the north.

The site is generally surrounded by low density residential dwellings to the south and medium density residential dwellings to the north of Windermere Avenue. Various notable developments also surround the site including, The Hills School located approximately 250m to the south-east. The Northmead Industrial area is located approximately 1.4kms to the south of the site and the Baulkham Hills town centre located approximately 2km to the north.

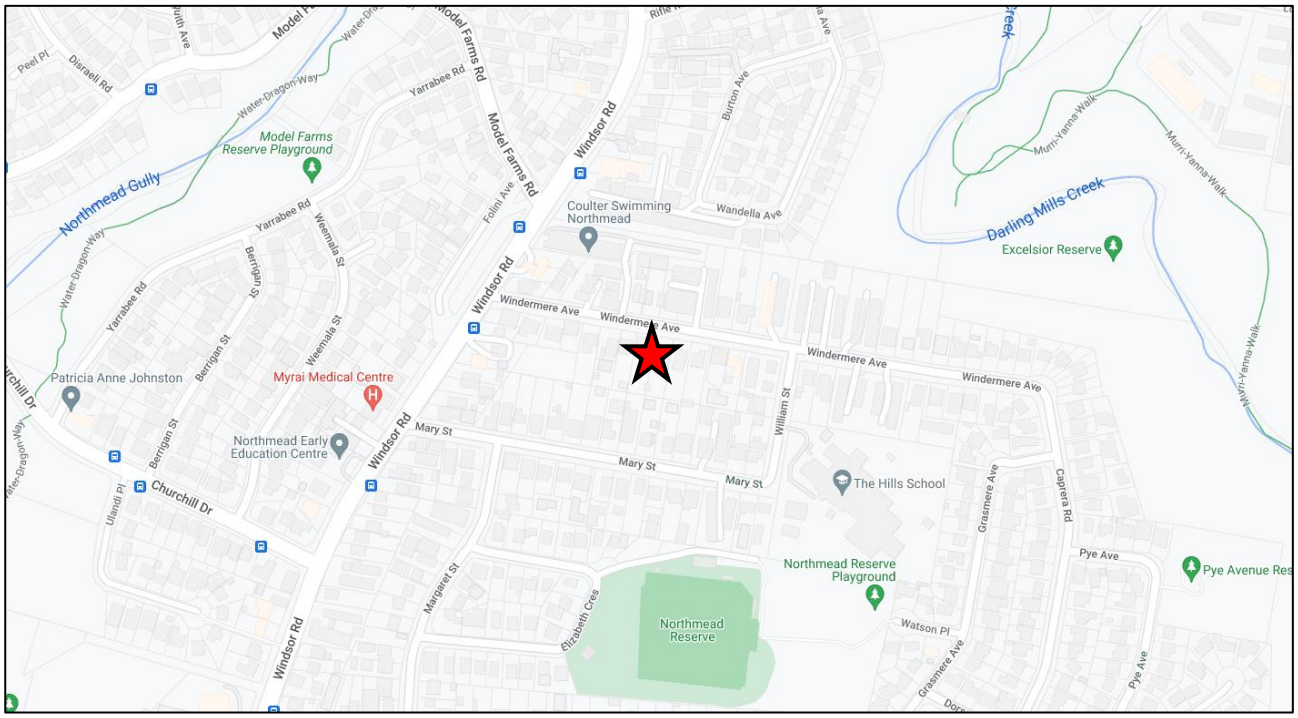
1.4 Site Context

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



Site Location

FIGURE 1: SITE CONTEXT – AERIAL PHOTO



Site Location

FIGURE 2: SITE CONTEXT – STREET MAP

2 EXISTING TRAFFIC AND PARKING CONDITIONS

2.1 Road Hierarchy

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

2.1.1 Windermere Avenue

- Unclassified LOCAL Road;
- Approximately 10m wide two-way carriageway facilitating traffic flow lane in both directions and kerbside parking along both sides of the road;
- Signposted 50km/h speed limit;
- Unrestricted kerbside parking permitted along both sides of the road.

2.1.2 Windsor Road

- TfNSW Classified STATE MAIN Road (No. 184);
- Approximately 13m wide two-way carriageway facilitating two (2) traffic flow lanes in each direction;
- Signposted 60km/h speed limit;
- 'Clearway At All Times' restrictions on both sides of the road.

2.1.3 William Street

- Unclassified LOCAL Road;
- Approximately 14m wide two-way carriageway facilitating traffic flow in both directions and kerbside parking along both sides of the road;
- Signposted 50km/h speed limit;
- 40km/h School Zone speed limit applying between 8:00am – 9:30am and 2:30 – 4:00pm on school days;
- Signposted *'1/4P 8am – 9:30am, 2:30pm – 4pm School Days'* along The Hills School frontage;
- Generally, unrestricted kerbside parking on both sides of the road within the vicinity of Windermere Avenue.

2.2 Existing Traffic Management

- Priority controlled intersection of Windsor Road / Windermere Avenue;
- Priority controlled intersection of Windermere Avenue / William Street;
- Signposted *'No Right Turn, 6am – 10am & 3pm – 7pm, Mon – Fri'* restrictions from Windsor Road into Windermere Avenue.

2.3 Existing Traffic Environment

Intersection traffic surveys were conducted at the intersections of Windsor Road / Windermere Avenue and Windermere Avenue / William Street from 7:00am to 9:30am and 2:30pm to 6:00pm on Wednesday 27 June 2022 representing a typical operating weekday. The full survey results are shown in **Annexure B** for reference.

2.3.1 Existing Road Performance

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

TABLE 1: EXISTING INTERSECTION PERFORMANCES (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE						
Windsor Road / Windermere Avenue	AM	0.83	1.8 (Worst: >70)	**NA** (Worst: F)	Give Way	RT from Windermere Avenue
	PM	1.40	2.8 (Worst: >70)	**NA** (Worst: F)		RT from Windermere Avenue
Windermere Avenue / William Street	AM	0.05	2.3 (Worst: 5)	**NA** (Worst: A)	Give Way	RT from William Street
	PM	0.05	1.8 (Worst: 5)	**NA** (Worst: A)		RT from William Street

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 intersection of Windermere Avenue / William Street is currently performing at a high level of efficiency, with a worst movement level of service “A” in both the AM and PM peak hour periods. The worst movement level of service for the Windsor Road / Windermere Avenue intersection is a level of service “F”, for the right turn from Windermere Avenue onto Windsor Road. It should be noted that the left turn from Windermere Avenue onto Windsor Road currently operates at a satisfactory level of service of either “B” or “C”, indicating additional spare capacity within this turn movement.

Review of the video footage during the peak hour of the survey has verified the existing delays of the right turn movement are on average 56 seconds in the AM peak period, and 1 minute 11 seconds in the PM peak period, resulting in a level of service “E” in the AM and “F” in the “PM”, with only three (3) and eight (8) right-turn movements observed respectively. The low volume of right turn manoeuvres is indicative that for most drivers this turn is unacceptable in terms of delays, risk, or both. It is likely that most drivers intending to travel north along Windsor Road use an alternative route.

It should be noted that in some circumstances, with intersections controlled by give way and stop signs simply examining the highest individual average delay can be misleading. The frequency of the movement with the highest average delay per vehicle should also be taken into account. Thus, for example, an intersection where all movements are operating at a level of service “A”, except one which is at level of service “E”, may not necessarily define the intersection level of service as “E” if that movement is of a relatively small traffic volume. That is, longer delays to a small number of vehicles may not justify upgrading an intersection unless a safety issue is also involved.

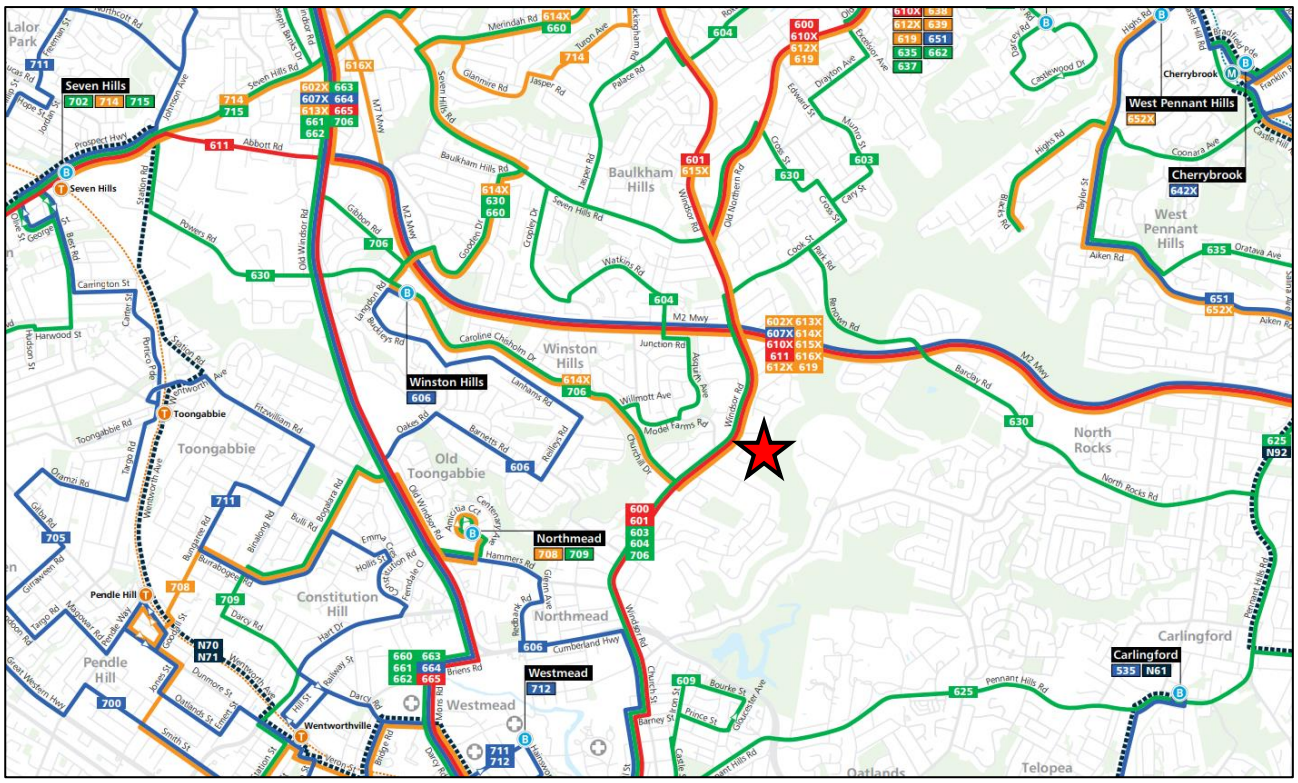
Based upon TfNSW Centre for Road Safety crash data available from their website, there appears to be an existing small cluster of crashes at the intersection of Windsor Road / Windermere Avenue, with five (5) accidents recorded between 2017 and 2021, with a copy of the crash statistics provided in **Annexure D**. As identified within the results of the SIDRA analysis summarised in **Table 1**, there are extended delays and limited turn volumes associated with the right turn movement. Considering that three of the five crashes recorded involved a right-turn movement from Windermere Avenue onto Windsor Road, there appears to be an existing safety issue with the right turn movement onto Windsor Road.

Based upon this crash history, the low turning volumes (for right turns) and the lengthy delays experienced during the peak hour, it is recommended that right-turn movements from Windermere Avenue onto Windsor Road are prohibited during the hours of 6 AM – 10 AM and 3 PM – 7 PM. This would be in a similar fashion to the currently signposted right-turn ban for vehicle movements from Windsor Road into Windermere Avenue. A right-turn ban will improve safety at this intersection and have a minimal impact on the existing traffic flows due to the low turn movements that would be displaced (3-8 vehicles during the peak hour). A recommendation for prohibit right-turn movements at this intersection would have to be recommended and approved by Council’s local traffic committee and could be installed at the cost of the applicant.

2.4 Public Transport

The subject site has access to existing bus stop (ID: 215235) located approximately 200m walking distance to the west of site on Windsor Road. The bus stop services existing bus route 600 (Hornsby to Parramatta), 601 (Rouse Hill Station to Parramatta via Hills Showground), 603 (Rouse Hill Station to Parramatta via Glenhaven) and 614X (Crestwood Reserve to City QVB (Express Service)) provided by Hillsbus.

The location of the site subject to the surrounding public transport network is shown in **Figure 3**.



Site Location

FIGURE 3: PUBLIC TRANSPORT NETWORK MAP

2.5 Future Road and Infrastructure Upgrades

From City of Parramatta Development Application tracker and website, it appears that there are no future planned road or public transport changes that will affect traffic conditions within the immediate vicinity of the subject site.

3 PARKING ASSESSMENT

3.1 Council Parking Requirement

Reference is made to *The Hills Development Control Plan 2012 – Part C Section 1 - Parking* which designates the following parking rates applicable to the proposed development:

> ***Table 1 – Required Minimum Car Parking Provisions***
>
> *Education*
>
> *Child Care Centre*
>
> > *1 space per staff member plus 1 space per 6 children enrolled for visitors and/or parent parking*

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

TABLE 2: DCP PARKING RATES

Land Use	Scale	Rate	Spaces Required	Spaces Provided
Child Care Centre	88 Children	1 per 6 children	15	11
	17 Staff	1 per staff	17	11
TOTAL			**32**	**22**

As shown, strict application of the DCP requires the provision of **32** car parking spaces, (with **15** for parent use and **17** for staff use). The proposed plans detail the provision of **22** car parking spaces, resulting in a numerical shortfall of 10 spaces with DCP parking requirements.

3.2 RTA Guide Parking Requirement

Reference is made to the *RTA Guide to Traffic Generating Developments (2002)* as adopted by Transport for NSW (TfNSW) which designates the following parking rates applicable to the proposed development:

> ***5.12.3 Child care centres***
>
> ***Parking***
>
> > *Off-street parking must be provided at the rate of one space for every four children in attendance.*

Table 3 presents the parking requirements of the proposal according to the RTA's above car parking rates.

TABLE 3: RTA PARKING RATES

Land Use	Scale	Rate	Spaces Required	Spaces Provided
Child Care Centre	88 Children	1 per 4 children	22	22

As shown, strict application of the RTA Guide requires the provision of 22 car parking spaces. The proposed plans detail the provision of 22 car parking spaces, resulting in compliance with the RTA Guide's parking requirements.

The application of the RTA Guide parking provisions is considered more applicable than The Hills DCP parking rates. It should be noted that whilst the proposed development is subject to The Hills DCP, the site is located within the Parramatta Council LGA. Reference is made to the *Parramatta Development Control Plan 2011 – Part 5 Other Provisions* which states the following:

> *On site car parking is to be provided at the rate of a minimum of 1 parking space per 4 child care places.*

As such, it is considered appropriate to adopt the RTA Guide's parking requirements for the subject development.

3.3 Parking for People with Disabilities

The Hills DCP does not outline car parking rates for people with disabilities applicable to child care centre developments. As such, reference is made to *Table D3.5* of the *Building Code of Australia* (BCA) as part of the *National Construction Code 2019* (NCC) which categorises a child care centre as a Class 9b building and therefore requires the provision of car parking for people with disabilities at a rate of:

Class 9b	*1 space for every 50 carparking spaces or part thereof.*

In accordance with the BCA requirements, one (**1**) car parking space for people with disabilities is to be provided. The proposed car parking layout details the provision of one (**1**) car parking space designed in accordance with *AS2890.6:2009*, complying with BCA requirements.

3.4 Bicycle Parking Requirement

The Hills DCP does not require the provision of bicycle parking for child care centre developments. No bicycle parking has been provided, satisfying DCP requirements.

3.5 Motorcycle Parking Requirement

The Hills DCP requires that motorcycle parking be provided for all developments with on-site parking of more than 50 car parking spaces, at a rate of 1 motorcycle space for every 50 car parking spaces or part thereof. The proposed development contains 22 car parking spaces and therefore does not require the provision of motorcycle parking. No motorcycle parking has been provided, satisfying DCP requirements.

3.6 Servicing & Loading

It is expected that all deliveries will be undertaken within the proposed car parking area outside peak drop off/ pick up times, under a plan of management if necessary. A van (standard B99 design vehicle) or similar can be accommodated within the car parking area, utilising vacant visitor spaces. This is common practice for child care centres and will not noticeably affect operation of the site. It is reiterated that deliveries and other arrivals of similar nature are low in frequency and can be easily managed.

It is understood that waste collection will be carried out on-street, similar to Council's existing waste collection services.

3.7 Car Park Design & Compliance

The car parking layout as depicted in **Annexure A,** has been assessed to achieve the relevant clauses and objectives of *AS2890.1:2004* and *AS2890.6:2009*. Any variances from standards are addressed in the following subsections including required changes, if any. Swept path testing has been undertaken and are reproduced within **Annexure E** for reference.

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

- 5.8m wide two-way driveway facilitating access to Windermere Avenue;
- Minimum 5.8m wide parking aisles;
- Minimum 5.4m long, 2.4m wide spaces for staff;
- Minimum 5.4m long, 2.6m wide spaces for parents / visitors;
- Minimum 5.4m long, 2.6m wide accessible spaces with adjacent associated 5.4m long, 2.6m wide shared space;
- Minimum headroom of 2.2m for general circulation and 2.5m headroom clearance provided over accessible and adaptable parking areas;

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

4 TRAFFIC ASSESSMENT

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

4.1 Traffic Generation

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

> ***3.11.3 Child care centres***
>
> *Long-day care*
>
> *7.00-9.00am* *0.8 peak vehicle trips per child*
>
> *4.00-6.00pm* *0.7 peak vehicle trips per child*

The resulting AM and PM peak hourly traffic generation is summarised in **Table 4**.

TABLE 4: ESTIMATED TRAFFIC GENERATION

Use	Scale	Peak	Generation Rate	Trips[(1)]
Long-day care	88 Children	AM	0.8 per child	70 (35 in, 35 out)
		PM	0.7 per child	62 (31 in, 31 out)

Notes:
(1) 50/50 inbound/outbound split.

As shown, the expected traffic generation associated with the proposed development is in the order of **70** vehicle trips in the AM peak period (35 in, 35 out) and **62** vehicle trips in the PM peak period (31 in, 31 out).

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:

To the site:

- 30% from the north via Windsor Road;
- 60% from the south via William Street;
- 10% from the east via Windermere Avenue.

From the site:

- 30% to the north via William Street;
- 60% to the south via Windsor Road;
- 10% to the east via Windermere Avenue.

As outlined above in **Section 2.3.1** the existing performance of the right-turn movement from Windermere Avenue onto Windsor Road and the existing cluster of crashes related to this turn movement, it is proposed to ban right turn movements from Windermere Avenue during the AM peak period (6 AM – 10 AM) and PM peak period (3 PM – 7 PM).

The traffic generation adopted has been undertaken with the assumption that this turn movement is prohibited as described above. If this turn movement was not prohibited it is expected that parents would generally not adopt to undertake this turn movement, due to the extended delays experienced, opting to otherwise use the intersection at Mary Street or Anderson Road to turn right, if required.

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 9.0 was used to assess the intersections performance. The purpose of this assessment is to compare the existing intersection operations to the future scenario under the increased traffic load. The results of this assessment are shown in **Table 5**.

TABLE 5: INTERSECTION PERFORMANCE (SIDRA INTERSECTION 9.0)

Intersection	Peak Hour	Degree of Saturation[1]	Average Delay[2] (sec/veh)	Level of Service[3][4]	Control Type	Worst Movement
EXISTING PERFORMANCE						
Windsor Road / Windermere Avenue	AM	0.83	1.8 (Worst: >70)	**NA** (Worst: F)	Give Way	RT from Windermere Avenue
	PM	1.40	2.8 (Worst: >70)	**NA** (Worst: F)		RT from Windermere Avenue
Windermere Avenue / William Street	AM	0.05	2.3 (Worst: 5)	**NA** (Worst: A)	Give Way	RT from William Street
	PM	0.05	1.8 (Worst: 5)	**NA** (Worst: A)		RT from William Street
FUTURE (POST DEVELOPMENT) PERFORMANCE						
Windsor Road / Windermere Avenue	AM	0.85	1.9 (Worst: >70)	**NA** (Worst: F)	Give Way	RT from Windermere Avenue
	PM	1.40	2.9 (Worst: >70)	**NA** (Worst: F)		RT from Windermere Avenue
Windermere Avenue / William Street	AM	0.06	2.7 (Worst: 5.3)	**NA** (Worst: A)	Give Way	LT from William Street
	PM	0.06	2.3 (Worst: 5.1)	**NA** (Worst: A)		LT from William Street

NOTES: Refer to **Table 1**.

As shown, the intersection of Windsor Road / Windermere Avenue and Windermere Avenue / William Street all retain the same worst movement overall level of service under future conditions, indicating that there will be negligible impact on the existing road network as a result of the proposed development.

4.4 Residential Amenity

Increased traffic volumes along residential roads have the potential to impact some aspects of the amenity of residents in low-density residential neighbourhoods. Over certain traffic thresholds, the ability for aged or impaired persons to cross the road and the ability for children to play safely in the street are reduced and the ambient road noise becomes noticeable to residents. The *RTA Guide to Traffic Generating Developments 2002* (RTA Guide) as adopted by TfNSW, suggests that the environmental goal thresholds for local streets is **200** vehicles per hour and that ideally local streets should not exceed **300** vehicles per hour. The RTA Guide also suggests that the environmental goal thresholds for collector streets is **300** vehicles per hour, and that collector streets should not exceed **500** vehicles per hour.

The traffic generated by the site will travel to and from the centre via the residential road Windermere Avenue and William Street. The existing and future peak hourly traffic volumes along these roads have been considered, as summarised in **Table 6**.

TABLE 6: RESIDENTIAL AMENITY - PEAK HOUR TRAFFIC FLOWS

Street	Existing (1)(2)		Future (5)	
	AM	PM	AM	PM
Windermere Avenue (3)	134	158	204	220
William Street (4)	78	70	110	98

Notes (1) Taken from intersection surveys reproduced within **Annexure B**.
(2) Highest two-way traffic flow along subject road in any hour within the survey period. Not necessarily the intersection peak.
(3) AM and PM two-way peak occurs at 8:00am – 9:00am and 4:00pm - 5:00pm respectively.
(4) AM and PM two-way peak occurs at 8:00am – 9:00am and 4:30pm - 5:30pm respectively.
(5) Future equals existing two-way traffic flow plus traffic generation and distribution as determined in **Section 4.1** and **4.2**.

As shown in the above table, the two-way peak hour flows under the future scenario for Windermere Avenue remains below the 300 vehicle per hour environmental goal threshold suggested in the RTA Guide for collector streets. Windermere Avenue (becoming Caprera Road further west) is considered a local collector street, serving as the primary collector for a range of local roads such as Grasmere Avenue, Pye Avenue, Dorset Avenue, Water Place for example. Therefore, it is concluded that residential amenity will not be adversely affected by the increases in two-way trips along Windermere Avenue due to the development.

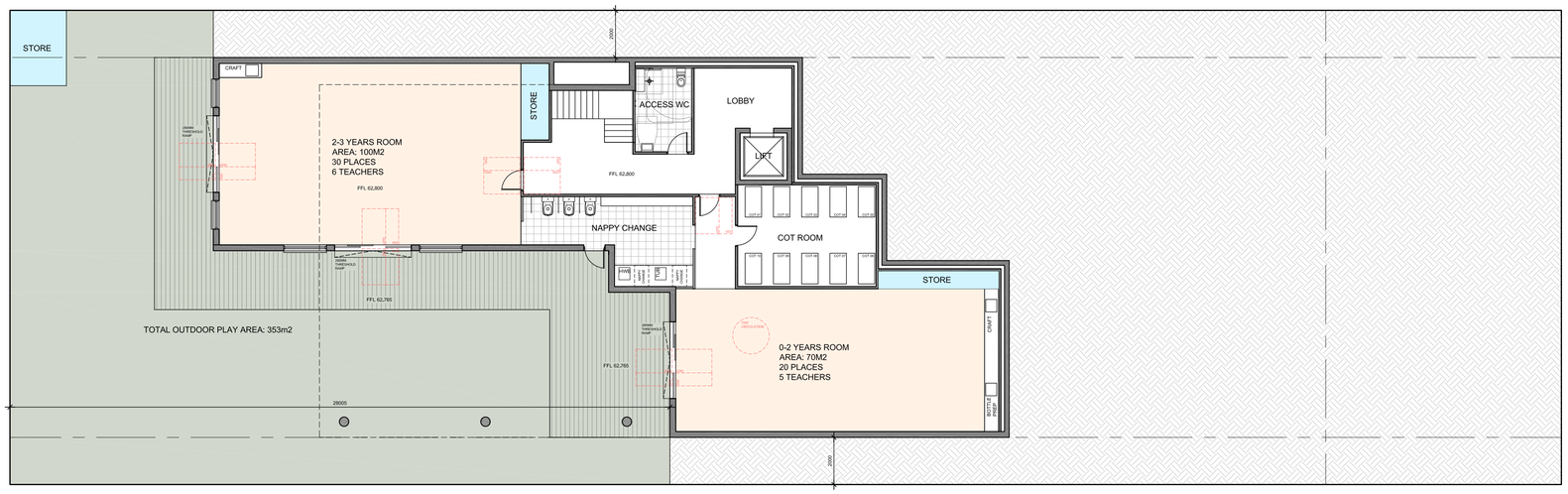
As shown in the above table, the two-way peak hour flows under the future scenario for William Street remains below the 200 vehicle per hour environmental goal threshold suggested in the RTA Guide thresholds for local roads. Therefore, it is concluded that residential amenity will not be adversely affected by the increases in two-way trips along William Street due to the development. The recommended prohibition of right-turns at Windsor Road, is not expected to increase traffic volumes along William Street to a level that would exceed the environmental threshold.

5 CONCLUSION

In view of the foregoing, the subject Child Care Centre proposal at 14 Windermere Avenue, Northmead (as depicted in **Annexure A**) is fully supportable in terms of its traffic and parking impacts. The following outcomes of this traffic impact assessment are relevant to note:

- The proposal includes the provision of **22** car parking spaces within a proposed carpark, comprised of **11** for parent use and **11** for staff use, satisfying the RTA Guide parking requirement.
- Council's DCP does not require the provision of bicycle and motorcycle parking facilities.
- The parking areas of the site have been assessed against the relevant sections of *AS2890.1:2004* and *AS2890.6:2009* and have been found to satisfy the objectives of each standard. Swept path testing has been undertaken and is reproduced within **Annexure E**.
- The traffic generation of the proposed development has been estimated to be some **70** trips in the AM peak period (35 in, 35 out) and **62** trips in the PM peak period (31 in, 31 out). The impacts of the traffic generation have been modelled using SIDRA INTERSECTION 9.0, indicating that there will be no detrimental impact to the performance of the intersections as a result of the generated traffic.
- The residential amenity of both Windermere Avenue and William Street will not be adversely affected by the increase in two-way vehicle trips, both operating with future traffic volumes below the environmental goal thresholds as outlined in the RTA Guide.
- It is recommended that due to the existing extended delays experienced and the existing record of road safety issues related to the right turn from Windermere Avenue into Windsor Road, that this turn movement be prohibited between 6 AM – 10 AM and 3 PM and 7 PM, in line with the existing prohibited right-turn from Windsor Road during the same time period.

ANNEXURE A: PROPOSED PLANS
(1 SHEET)



LOWER GROUND FLOOR PLAN -
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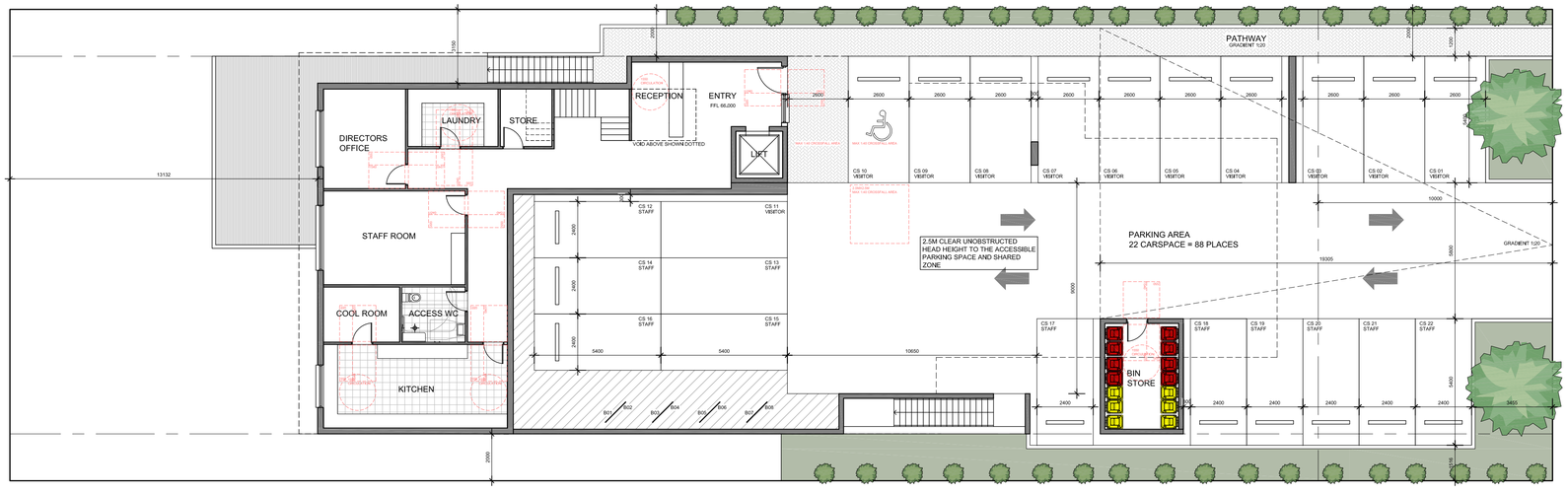
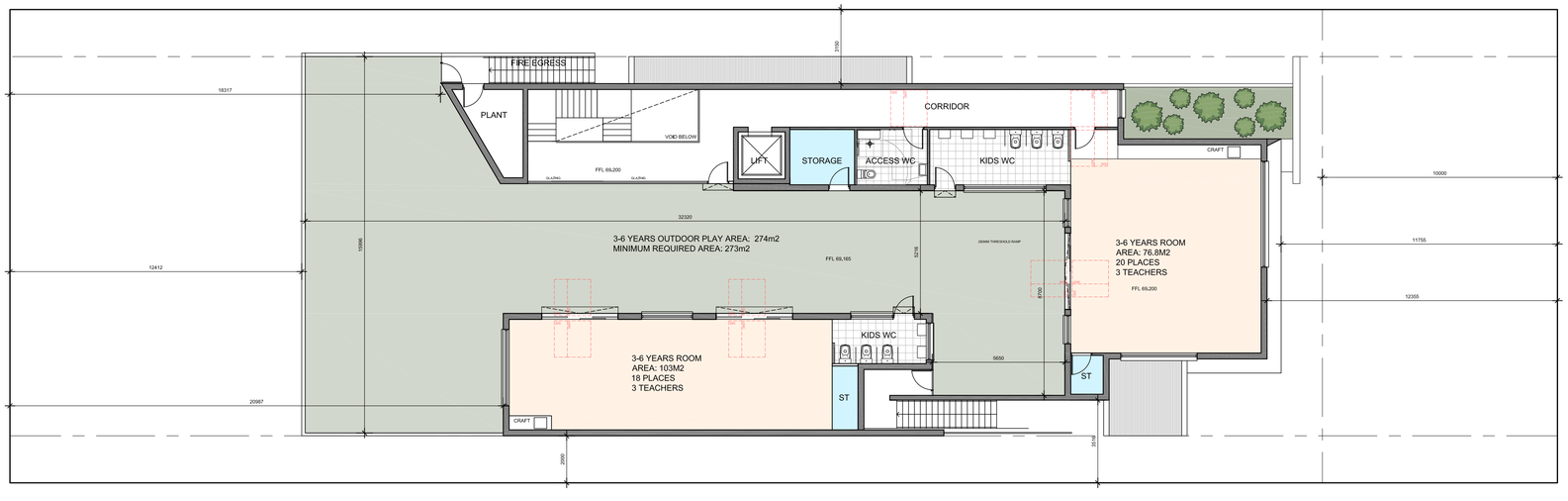


GROUND FLOOR PLAN -
1:100 @ A1



FIRST FLOOR PLAN -
1:100 @ A1

ANNEXURE B: TRAFFIC SURVEY DATA
(2 SHEETS)

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Windsor Rd and Windermere Ave, Nortl

GPS	*-33.777700, 150.999526*
Date:	Wed 27/07/22
Weather:	Fine
Suburban:	Northmead
Customer:	McLaren

North:	Windsor Rd
East:	Windermere Ave
South:	Windsor Rd
West:	N/A

Survey Period	AM:	7:00 AM-9:30 AM
	PM:	2:30 PM-6:00 PM
Traffic Peak	AM:	7:15 AM-8:15 AM
	PM:	4:45 PM-5:45 PM

All Vehicles

Time		lorth Approach Windsor R			st Approach Windermere A			outh Approach Windsor R			Hourly Total	
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	Hour	Peak
7:00	7:15	0	417	2	0	3	7	0	1	302	3261	
7:15	7:30	0	507	6	0	0	3	0	0	286	3285	Peak
7:30	7:45	0	550	13	0	1	10	0	0	322	3252	
7:45	8:00	0	520	11	0	1	8	0	0	291	3200	
8:00	8:15	0	442	10	0	1	12	0	0	291	3195	
8:15	8:30	0	437	22	0	1	9	0	1	299	3215	
8:30	8:45	0	489	9	0	1	10	0	2	333	3196	
8:45	9:00	0	464	25	0	0	9	0	0	328		
9:00	9:15	0	468	13	0	0	8	0	1	286		
9:15	9:30	0	459	5	0	2	1	0	0	283		
14:30	14:45	0	346	11	0	3	6	0	5	418	3414	
14:45	15:00	0	335	13	0	7	6	0	1	443	3480	
15:00	15:15	0	408	12	0	2	7	0	2	455	3552	
15:15	15:30	0	392	21	0	2	11	0	2	506	3553	
15:30	15:45	0	429	19	0	4	6	0	2	395	3599	
15:45	16:00	0	374	19	0	1	7	1	0	475	3675	
16:00	16:15	0	405	15	0	3	11	0	4	449	3716	
16:15	16:30	0	457	18	0	2	11	0	2	490	3730	
16:30	16:45	0	392	22	0	2	11	0	1	503	3713	
16:45	17:00	0	414	29	0	0	7	0	1	467	3734	Peak
17:00	17:15	0	395	17	0	4	18	0	1	466	3712	
17:15	17:30	0	458	17	0	4	12	0	1	471		
17:30	17:45	0	431	18	0	0	14	0	0	489		
17:45	18:00	0	464	19	0	5	7	0	2	399		

Peak Time		lorth Approach Windsor R			st Approach Windermere A			outh Approach Windsor R			Peak total
Period Start	Period End	U	SB	L	U	R	L	U	R	NB	
7:15	8:15	0	2019	40	0	3	33	0	0	1190	3285
16:45	17:45	0	1698	81	0	8	51	0	3	1893	3734

TRANS TRAFFIC SURVEY

trafficsurvey.com.au

TURNING MOVEMENT SURVEY

Intersection of Windermere Ave and William St, Northm

GPS	-33.778236, 151.003135						
Date:	Wed 27/07/22	***North:***	N/A	***Survey Period***	AM:	7:00 AM-9:30 AM
Weather:	Fine	***East:***	Windermere Ave		PM:	2:30 PM-6:00 PM
Suburban:	Northmead	***South:***	William St	***Traffic Peak***	AM:	8:00 AM-9:00 AM
Customer:	McLaren	***West:***	Windermere Ave		PM:	4:15 PM-5:15 PM

All Vehicles

Time		st Approach Windermere A			South Approach William St			st Approach Windermere A			Hourly Total	
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	Hour	Peak
7:00	7:15	0	4	4	0	0	2	0	3	4	99	
7:15	7:30	1	4	5	0	1	1	0	5	4	126	
7:30	7:45	1	9	3	0	1	3	0	6	8	148	
7:45	8:00	1	6	5	0	0	4	0	4	10	157	
8:00	8:15	1	15	7	0	1	3	1	6	10	172	Peak
8:15	8:30	1	5	6	0	1	2	1	10	17	157	
8:30	8:45	0	11	7	0	2	3	0	4	13	130	
8:45	9:00	0	6	9	0	3	3	0	11	13		
9:00	9:15	0	8	2	0	2	2	0	5	10		
9:15	9:30	0	3	3	0	1	5	0	2	2		
14:30	14:45	0	6	1	2	2	4	0	9	7	142	
14:45	15:00	0	9	1	1	3	7	0	5	7	151	
15:00	15:15	1	10	1	0	1	1	0	7	9	149	
15:15	15:30	1	15	3	2	0	6	0	5	16	162	
15:30	15:45	0	12	0	0	2	7	0	5	14	156	
15:45	16:00	0	12	1	0	1	2	0	2	13	168	
16:00	16:15	0	12	5	0	0	3	0	5	18	180	
16:15	16:30	0	10	4	0	2	8	0	3	15	181	Peak
16:30	16:45	0	12	3	0	2	5	1	4	25	179	
16:45	17:00	0	6	5	0	1	8	0	3	20	155	
17:00	17:15	0	9	3	0	4	6	0	7	15	150	
17:15	17:30	0	10	1	0	6	8	0	4	11		
17:30	17:45	1	4	1	0	0	3	1	4	14		
17:45	18:00	0	10	1	0	3	8	0	1	15		

Peak Time		st Approach Windermere A			South Approach William St			st Approach Windermere A			Peak
Period Start	Period End	U	WB	L	U	R	L	U	R	EB	total
8:00	9:00	2	37	29	0	7	11	2	31	53	172
16:15	17:15	0	37	15	0	9	27	1	17	75	181

ANNEXURE C: SIDRA RESULTS
(8 SHEETS)

MOVEMENT SUMMARY

Site: 01 [EX AM Windsor Rd / Windermere Ave (Site Folder: Existing)]

Windsor Road / Windermere Avenue
Existing Conditions
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Windsor Road (S)														
2	T1	1190	93	1253	7.8	0.338	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1190	93	1253	7.8	0.338	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Windermere Avenue (E)														
4	L2	33	3	35	9.1	0.127	16.9	LOS C	0.4	3.0	0.81	0.91	0.81	42.5
6	R2	3	1	3	33.3	0.825	1421.2	LOS F	1.9	17.5	1.00	1.03	1.13	2.4
Approach		36	4	38	11.1	0.825	133.9	LOS F	1.9	17.5	0.82	0.92	0.83	18.0
North: Windsor Road (N)														
7	L2	40	2	42	5.0	0.569	5.8	LOS A	0.0	0.0	0.00	0.02	0.00	57.5
8	T1	2019	70	2125	3.5	0.569	0.3	LOS A	0.0	0.0	0.00	0.01	0.00	59.4
Approach		2059	72	2167	3.5	0.569	0.4	NA	0.0	0.0	0.00	0.01	0.00	59.3
All Vehicles		3285	169	3458	5.1	0.825	1.8	NA	1.9	17.5	0.01	0.02	0.01	58.0

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

MOVEMENT SUMMARY

Site: 01 [EX PM Windsor Rd / Windermere Ave (Site Folder: Existing)]

Windsor Road / Windermere Avenue
Existing Conditions
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Windsor Road (S)														
2	T1	1896	39	1996	2.1	0.519	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach		1896	39	1996	2.1	0.519	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.6
East: Windermere Avenue (E)														
4	L2	51	0	54	0.0	0.119	11.3	LOS B	0.4	2.8	0.69	0.85	0.69	45.6
6	R2	8	0	8	0.0	1.404	1101.6	LOS F	4.5	31.6	1.00	1.17	1.75	2.8
Approach		59	0	62	0.0	1.404	159.1	LOS F	4.5	31.6	0.73	0.90	0.83	14.9
North: Windsor Road (N)														
7	L2	81	1	85	1.2	0.494	5.7	LOS A	0.0	0.0	0.00	0.05	0.00	57.5
8	T1	1698	72	1787	4.2	0.494	0.2	LOS A	0.0	0.0	0.00	0.03	0.00	59.4
Approach		1779	73	1873	4.1	0.494	0.5	NA	0.0	0.0	0.00	0.03	0.00	59.3
All Vehicles		3734	112	3931	3.0	1.404	2.8	NA	4.5	31.6	0.01	0.03	0.01	56.7

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

MOVEMENT SUMMARY

Site: 02 [EX AM Windermere Ave / William St (Site Folder: Existing)]

Windermere Avenue / William Street
Existing Conditions
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: William Street (S)														
1	L2	11	0	12	0.0	0.014	4.7	LOS A	0.0	0.3	0.11	0.52	0.11	46.4
3	R2	7	0	7	0.0	0.014	5.0	LOS A	0.0	0.3	0.11	0.52	0.11	45.9
Approach		18	0	19	0.0	0.014	4.8	LOS A	0.0	0.3	0.11	0.52	0.11	46.2
East: Windermere Avenue (E)														
4	L2	29	0	31	0.0	0.037	4.6	LOS A	0.0	0.0	0.00	0.24	0.00	48.1
5	T1	37	2	39	5.4	0.037	0.0	LOS A	0.0	0.0	0.00	0.24	0.00	48.6
Approach		66	2	69	3.0	0.037	2.0	NA	0.0	0.0	0.00	0.24	0.00	48.4
West: Windermere Avenue (W)														
11	T1	53	1	56	1.9	0.050	0.1	LOS A	0.2	1.3	0.12	0.21	0.12	48.5
12	R2	33	0	35	0.0	0.050	4.8	LOS A	0.2	1.3	0.12	0.21	0.12	47.6
Approach		86	1	91	1.2	0.050	1.9	NA	0.2	1.3	0.12	0.21	0.12	48.1
All Vehicles		170	3	179	1.8	0.050	2.3	NA	0.2	1.3	0.07	0.25	0.07	48.0

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

MOVEMENT SUMMARY

Site: 02 [EX PM Windermere Ave / William St (Site Folder: Existing)]

Windermere Avenue / William Street
Existing Conditions
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: William Street (S)														
1	L2	27	0	28	0.0	0.026	4.7	LOS A	0.1	0.7	0.10	0.51	0.10	46.4
3	R2	9	0	9	0.0	0.026	5.0	LOS A	0.1	0.7	0.10	0.51	0.10	46.0
Approach		36	0	38	0.0	0.026	4.8	LOS A	0.1	0.7	0.10	0.51	0.10	46.3
East: Windermere Avenue (E)														
4	L2	15	0	16	0.0	0.029	4.6	LOS A	0.0	0.0	0.00	0.16	0.00	48.6
5	T1	37	1	39	2.7	0.029	0.0	LOS A	0.0	0.0	0.00	0.16	0.00	49.1
Approach		52	1	55	1.9	0.029	1.3	NA	0.0	0.0	0.00	0.16	0.00	48.9
West: Windermere Avenue (W)														
11	T1	75	1	79	1.3	0.052	0.0	LOS A	0.1	0.7	0.06	0.10	0.06	49.3
12	R2	17	0	18	0.0	0.052	4.7	LOS A	0.1	0.7	0.06	0.10	0.06	48.3
Approach		92	1	97	1.1	0.052	0.9	NA	0.1	0.7	0.06	0.10	0.06	49.1
All Vehicles		180	2	189	1.1	0.052	1.8	NA	0.1	0.7	0.05	0.20	0.05	48.5

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

MOVEMENT SUMMARY

Site: 01 [FU AM Windsor Rd / Windermere Ave (Site Folder: Future)]

Windsor Road / Windermere Avenue
Existing Conditions
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Windsor Road (S)														
2	T1	1190	93	1253	7.8	0.338	0.1	LOS A	0.0	0.0	0.00	0.00	0.00	59.8
Approach		1190	93	1253	7.8	0.338	0.1	NA	0.0	0.0	0.00	0.00	0.00	59.8
East: Windermere Avenue (E)														
4	L2	54	3	57	5.6	0.196	17.1	LOS C	0.6	4.7	0.81	0.93	0.85	43.8
6	R2	3	1	3	33.3	0.849	1473.3	LOS F	2.0	18.1	1.00	1.03	1.13	2.4
Approach		57	4	60	7.0	0.849	93.8	LOS F	2.0	18.1	0.82	0.93	0.86	22.8
North: Windsor Road (N)														
7	L2	51	2	54	3.9	0.572	5.8	LOS A	0.0	0.0	0.00	0.03	0.00	57.5
8	T1	2019	70	2125	3.5	0.572	0.3	LOS A	0.0	0.0	0.00	0.01	0.00	59.3
Approach		2070	72	2179	3.5	0.572	0.4	NA	0.0	0.0	0.00	0.01	0.00	59.3
All Vehicles		3317	169	3492	5.1	0.849	1.9	NA	2.0	18.1	0.01	0.03	0.01	57.9

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

MOVEMENT SUMMARY

Site: 01 [FU PM Windsor Rd / Windermere Ave (Site Folder: Future)]

Windsor Road / Windermere Avenue
Existing Conditions
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: Windsor Road (S)														
2	T1	1893	39	1993	2.1	0.518	0.2	LOS A	0.0	0.0	0.00	0.00	0.00	59.6
Approach		1893	39	1993	2.1	0.518	0.2	NA	0.0	0.0	0.00	0.00	0.00	59.6
East: Windermere Avenue (E)														
4	L2	70	0	74	0.0	0.162	11.6	LOS B	0.6	3.9	0.70	0.86	0.70	46.5
6	R2	8	0	8	0.0	1.404	1101.7	LOS F	4.5	31.6	1.00	1.17	1.75	2.8
Approach		78	0	82	0.0	1.404	123.4	LOS F	4.5	31.6	0.73	0.89	0.81	17.9
North: Windsor Road (N)														
7	L2	90	1	95	1.1	0.497	5.7	LOS A	0.0	0.0	0.00	0.06	0.00	57.4
8	T1	1698	72	1787	4.2	0.497	0.2	LOS A	0.0	0.0	0.00	0.03	0.00	59.3
Approach		1788	73	1882	4.1	0.497	0.5	NA	0.0	0.0	0.00	0.03	0.00	59.2
All Vehicles		3759	112	3957	3.0	1.404	2.9	NA	4.5	31.6	0.02	0.03	0.02	56.7

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

MOVEMENT SUMMARY

Site: 02 [FU AM Windermere Ave / William St (Site Folder: Future)]

Windermere Avenue / William Street
Existing Conditions
AM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: William Street (S)														
1	L2	32	0	34	0.0	0.028	5.3	LOS A	0.1	0.7	0.11	0.53	0.11	50.6
3	R2	7	0	7	0.0	0.028	5.1	LOS A	0.1	0.7	0.11	0.53	0.11	47.7
Approach		39	0	41	0.0	0.028	5.3	LOS A	0.1	0.7	0.11	0.53	0.11	50.0
East: Windermere Avenue (E)														
4	L2	29	0	31	0.0	0.039	4.6	LOS A	0.0	0.0	0.00	0.23	0.00	48.5
5	T1	40	2	42	5.0	0.039	0.0	LOS A	0.0	0.0	0.00	0.23	0.00	49.0
Approach		69	2	73	2.9	0.039	1.9	NA	0.0	0.0	0.00	0.23	0.00	48.8
West: Windermere Avenue (W)														
11	T1	56	1	59	1.8	0.058	0.1	LOS A	0.2	1.6	0.14	0.24	0.14	49.1
12	R2	44	0	46	0.0	0.058	5.0	LOS A	0.2	1.6	0.14	0.24	0.14	48.9
Approach		100	1	105	1.0	0.058	2.3	NA	0.2	1.6	0.14	0.24	0.14	49.0
All Vehicles		208	3	219	1.4	0.058	2.7	NA	0.2	1.6	0.09	0.29	0.09	49.1

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

MOVEMENT SUMMARY

Site: 02 [FU PM Windermere Ave / William St (Site Folder: Future)]

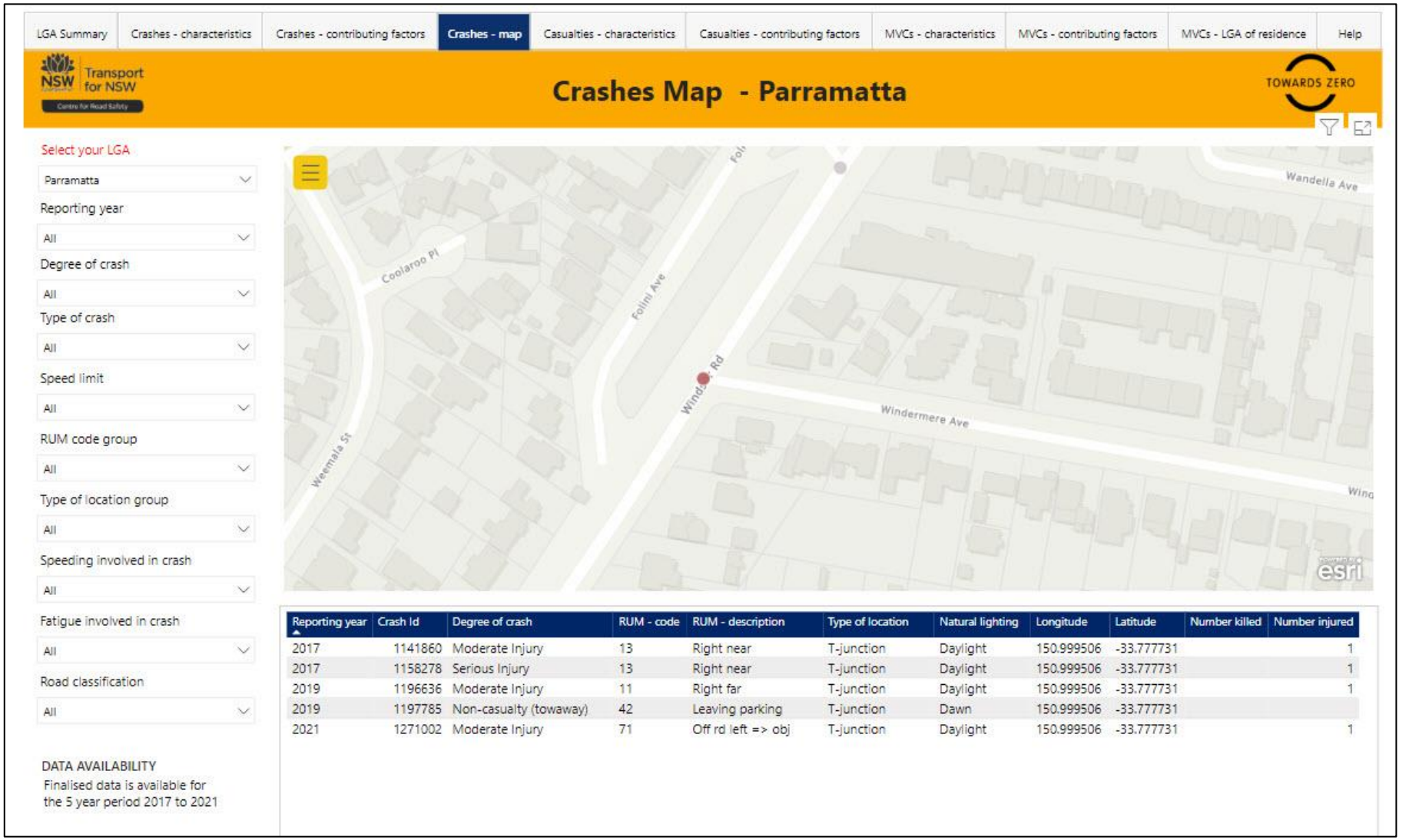
Windermere Avenue / William Street
Existing Conditions
PM Peak Period
Site Category: (None)
Give-Way (Two-Way)

Vehicle Movement Performance

Mov ID	Turn	INPUT VOLUMES [Total veh/h	HV] veh/h	DEMAND FLOWS [Total veh/h	HV] %	Deg. Satn v/c	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh. veh	Dist] m	Prop. Que	Effective Stop Rate	Aver. No. Cycles	Aver. Speed km/h
South: William Street (S)														
1	L2	46	0	48	0.0	0.039	5.1	LOS A	0.2	1.1	0.11	0.53	0.11	49.1
3	R2	9	0	9	0.0	0.039	5.1	LOS A	0.2	1.1	0.11	0.53	0.11	47.1
Approach		55	0	58	0.0	0.039	5.1	LOS A	0.2	1.1	0.11	0.53	0.11	48.8
East: Windermere Avenue (E)														
4	L2	15	0	16	0.0	0.030	4.6	LOS A	0.0	0.0	0.00	0.15	0.00	49.1
5	T1	40	1	42	2.5	0.030	0.0	LOS A	0.0	0.0	0.00	0.15	0.00	49.6
Approach		55	1	58	1.8	0.030	1.3	NA	0.0	0.0	0.00	0.15	0.00	49.4
West: Windermere Avenue (W)														
11	T1	78	1	82	1.3	0.059	0.1	LOS A	0.2	1.1	0.08	0.14	0.08	49.7
12	R2	26	0	27	0.0	0.059	5.0	LOS A	0.2	1.1	0.08	0.14	0.08	49.9
Approach		104	1	109	1.0	0.059	1.3	NA	0.2	1.1	0.08	0.14	0.08	49.7
All Vehicles		214	2	225	0.9	0.059	2.3	NA	0.2	1.1	0.07	0.24	0.07	49.4

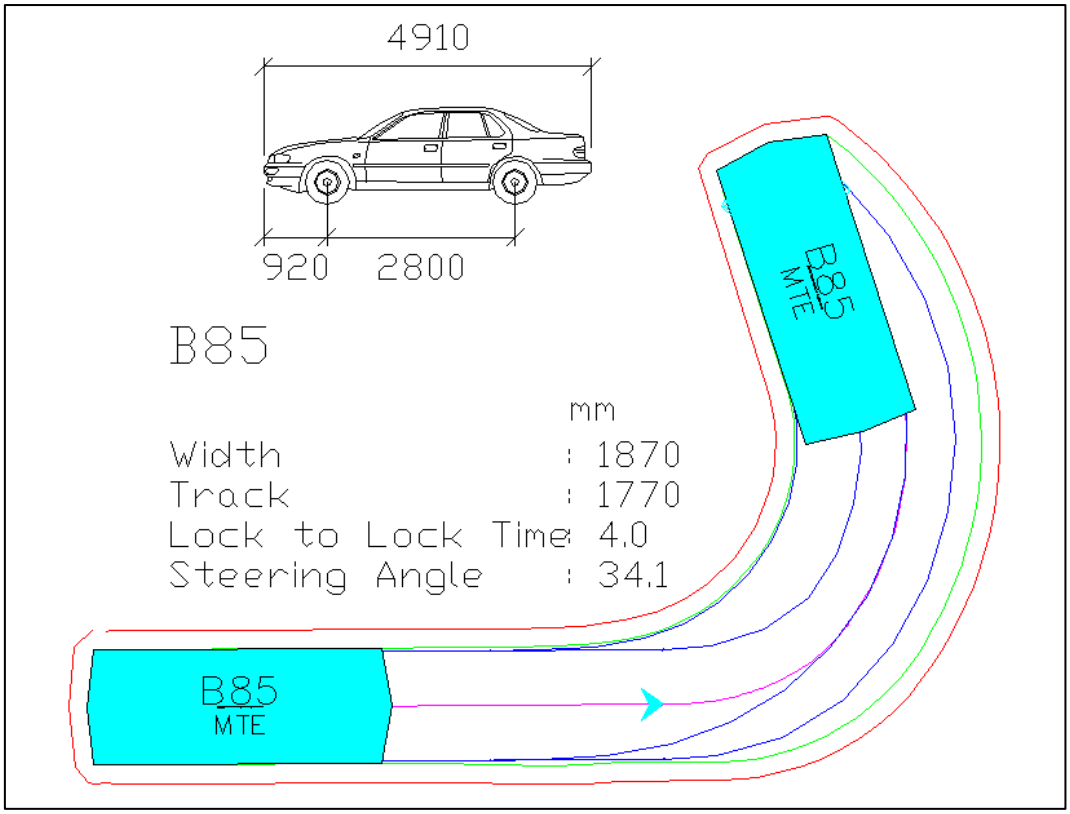
Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and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

ANNEXURE D: TFNSW CENTRE FOR ROAD SAFETY – CRASH DATA AT WINDSOR ROAD / WINDERMERE AVENUE
(1 SHEET)

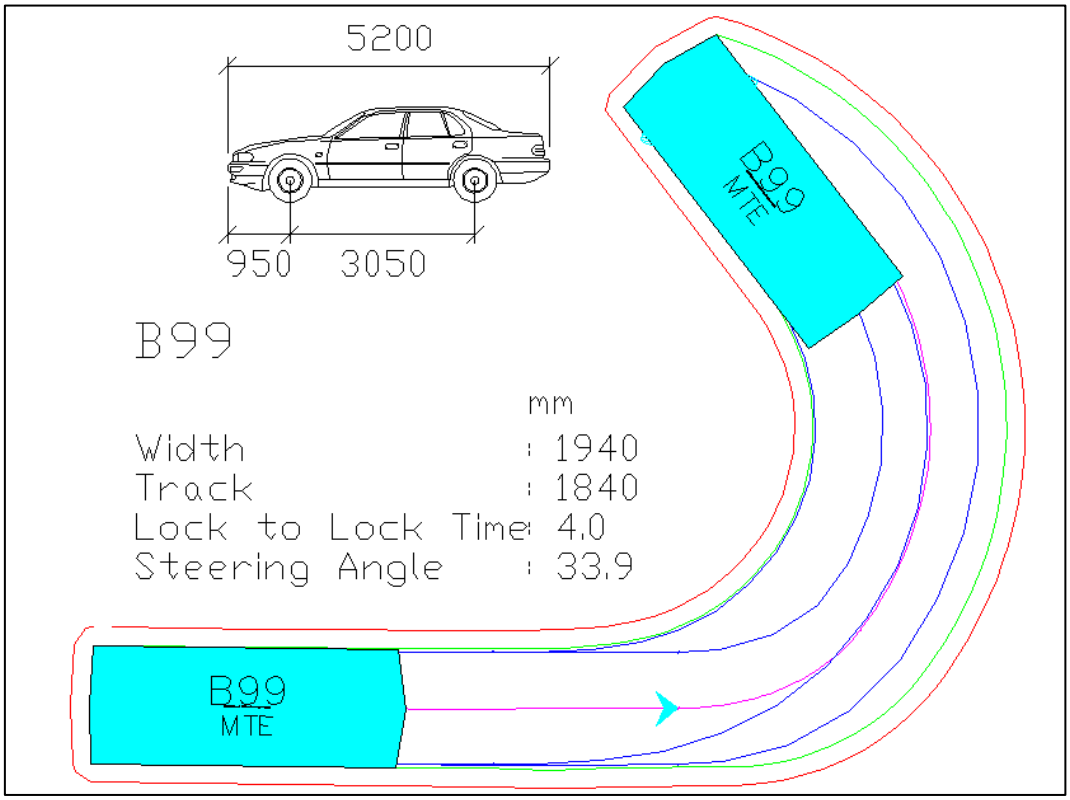


Reporting year	Crash Id	Degree of crash	RUM - code	RUM - description	Type of location	Natural lighting	Longitude	Latitude	Number killed	Number injured
2017	1141860	Moderate Injury	13	Right near	T-junction	Daylight	150.999506	-33.777731		1
2017	1158278	Serious Injury	13	Right near	T-junction	Daylight	150.999506	-33.777731		1
2019	1196636	Moderate Injury	11	Right far	T-junction	Daylight	150.999506	-33.777731		1
2019	1197785	Non-casualty (towaway)	42	Leaving parking	T-junction	Dawn	150.999506	-33.777731		
2021	1271002	Moderate Injury	71	Off rd left => obj	T-junction	Daylight	150.999506	-33.777731		1

ANNEXURE E: SWEPT PATH TESTING
(2 SHEETS)



AUSTRALIAN STANDARD 85TH PERCENTILE SIZE VEHICLE (B85)

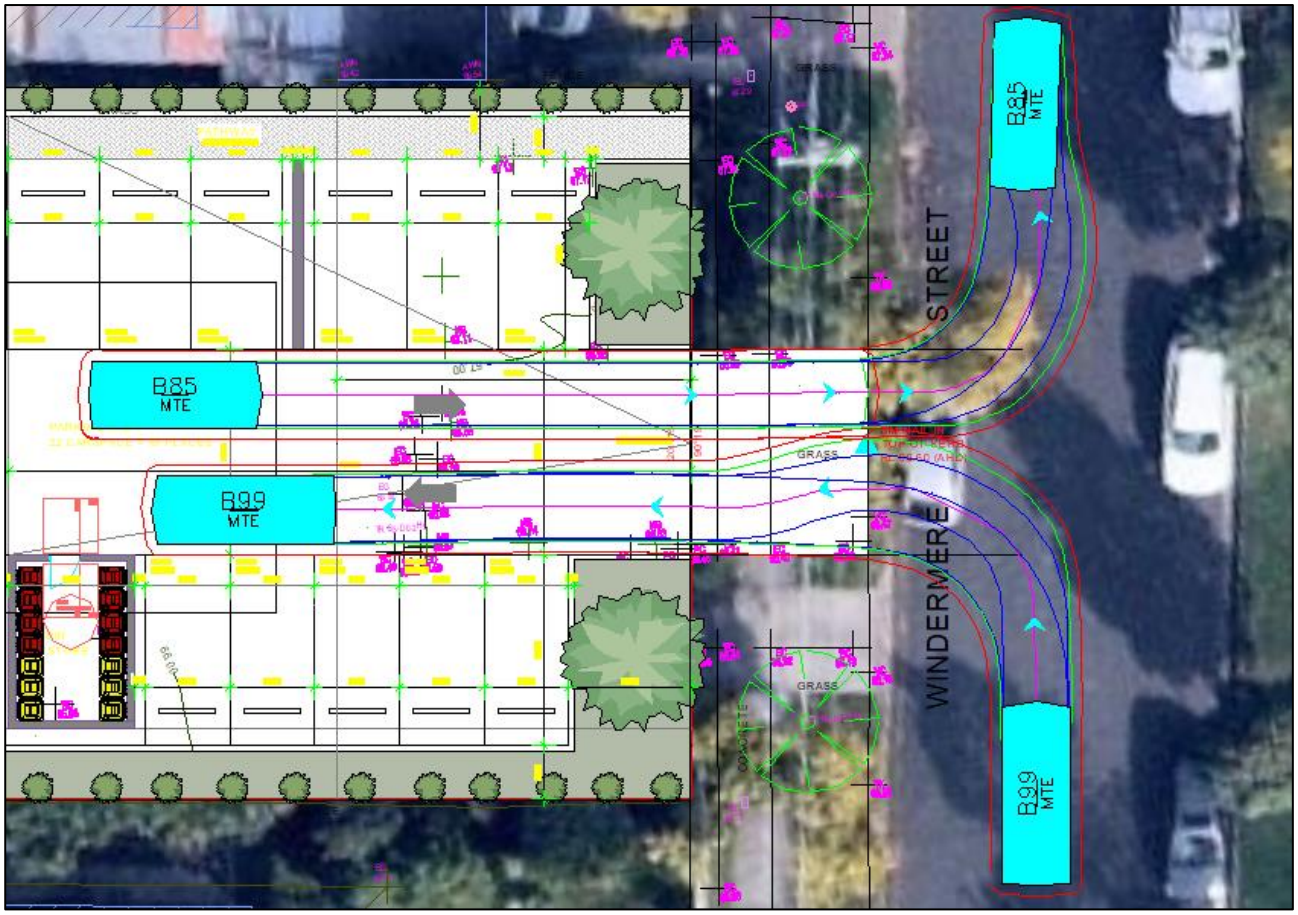


AUSTRALIAN STANDARD 99.8TH PERCENTILE SIZE VEHICLE (B99)

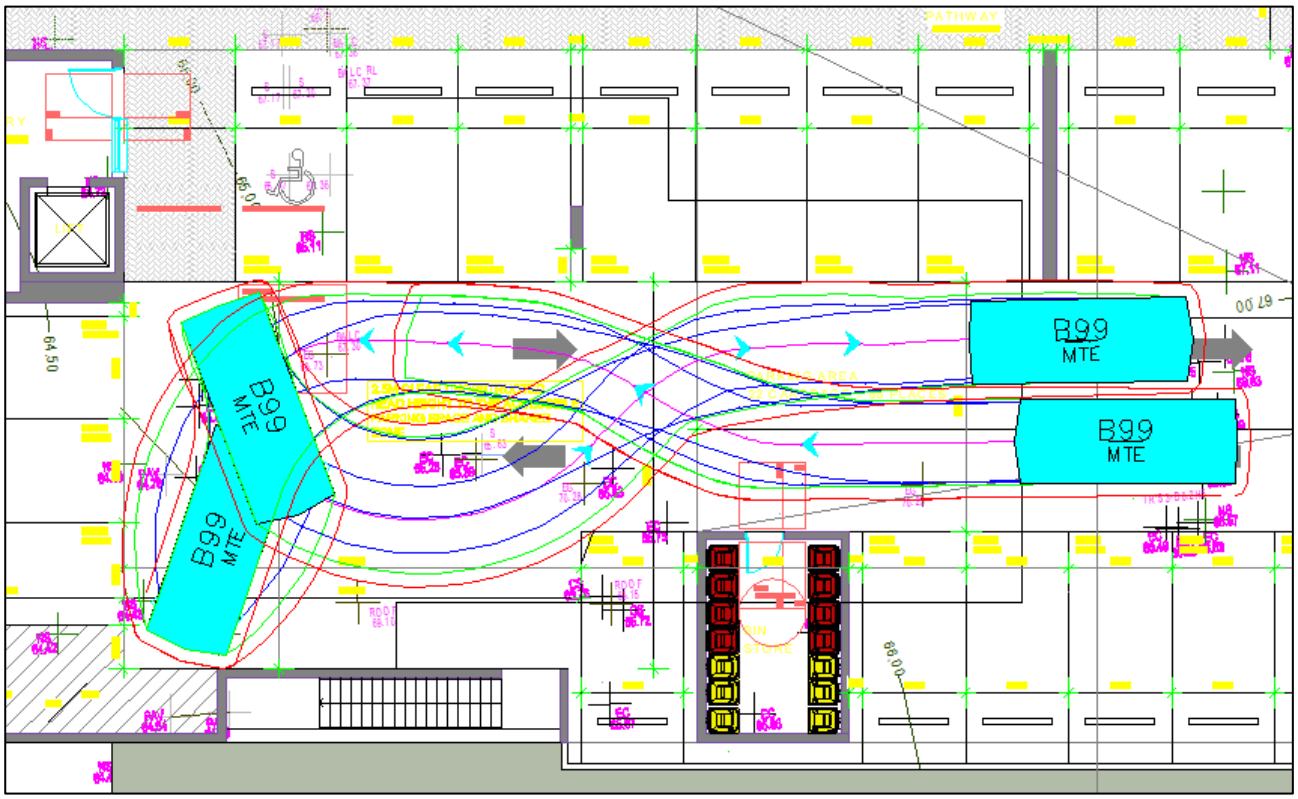
Blue – Tyre Path

Green – Vehicle Body

Red – 300mm Clearance



B85 PASSING B99
Successful



B99 TURNING IN AISLE
Successful – 3 Total Manoeuvres