

TRAFFIC AND PARKING IMPACT ASSESSMENT

Proposed Indoor Recreational Development
Kiss My Axe Brookvale

40 Winbourne Road Brookvale

Prepared for: Kiss My Axe Pty Ltd

A211733N (Version 1a)

June 2021

Motion Traffic Engineers Pty Ltd

Telephone: 940 33588

sydney@motiontraffic.com.au ACN 600201583

Contents

1. Introduction.....	3
2. Background and Existing Conditions of the Proposed Site	4
2.1. Location and Land Use	4
2.2. Road Network	6
2.3. Public Transport	7
2.4. Intersection Description	7
2.5. Existing Traffic Volume.....	10
2.6. Intersection Assessment with Existing Traffic Volume.....	12
2.7. On-street Parking Survey	14
2.8. Existing Conditions.....	16
3. Proposed indoor RECREATIONAL development.....	17
3.1. Facility, Parking and Access	17
3.2. Operation Details.....	17
3.3. Patronage details	17
4. Parking Requirements.....	20
4.1. Car Parking Rate	20
4.2. Adequacy of Car Parking Provision.....	20
4.2.1. Friday Evening.....	20
4.2.2. Saturday	21
4.3. Bicycle and Motorcycle Parking	22
5. Traffic Generation and Impact.....	23
5.1. Proposed Traffic Generation	23
5.1.1. Weekday PM.....	23
5.1.2. Saturday midday	23
5.1.3. Staff Trip.....	23
5.2. Trip Distribution.....	23
5.3. Future Traffic Volume	24
5.4. Traffic Impact.....	26
6. Access Internal Design Aspects.....	27
6.1. Site Access and Driveway.....	27
6.2. Parking	27

6.3. Sight Distance	27
7. Conclusions.....	28

1. INTRODUCTION

ML Traffic Engineers was commissioned by Kiss My Axe Pty Ltd to prepare this traffic and parking impact assessment to support a Development Application for a proposed indoor recreational development at 40 Winbourne Road in Brookvale. The proposed indoor recreational development is an axe throwing business named ‘Kiss My Axe” (www.kissmyaxe.com.au). There is an existing business located in Alexandria.

This traffic report presents an assessment of the anticipated transport and traffic implications of the proposed indoor recreational development, with the following considerations:

- ➔ Background and existing traffic and parking conditions of the indoor recreational site
- ➔ Assessment of the public transport network within the vicinity of the site
- ➔ Adequacy of car, bicycle and motorcycle parking provision
- ➔ The projected traffic generation of the proposed indoor recreational development and;
- ➔ The transport impact of the proposed indoor recreational development on the surrounding road network.

In the course of preparing this assessment, the indoor recreational site and its environs have been inspected, plans of the development are examined, all relevant traffic and parking data have been collected and analysed.

2. BACKGROUND AND EXISTING CONDITIONS OF THE PROPOSED SITE

2.1. Location and Land Use

The site is currently vacant and located at the rear of Lot 27, D.P. 1619, 40 Winbourne Road. The front of the lot is occupied by a two-storey building which is not a part of this DA.

The indoor recreational site has an area of approximately 443 m² with immediate surroundings being a mixture of light industrial premises and mixed-use premises. The land zoning is *IN1: General Industrial*.

Figure 1 shows the location and boundary of the indoor recreational site from aerial perspective. Figure 2 also shows the location of the site from a street map perspective and the location of the surveyed intersections in relation to the site.

Figure 3 shows the site frontage at Winbourne Road.



Figure 1: Location and Extent of the Indoor recreational site on Aerial

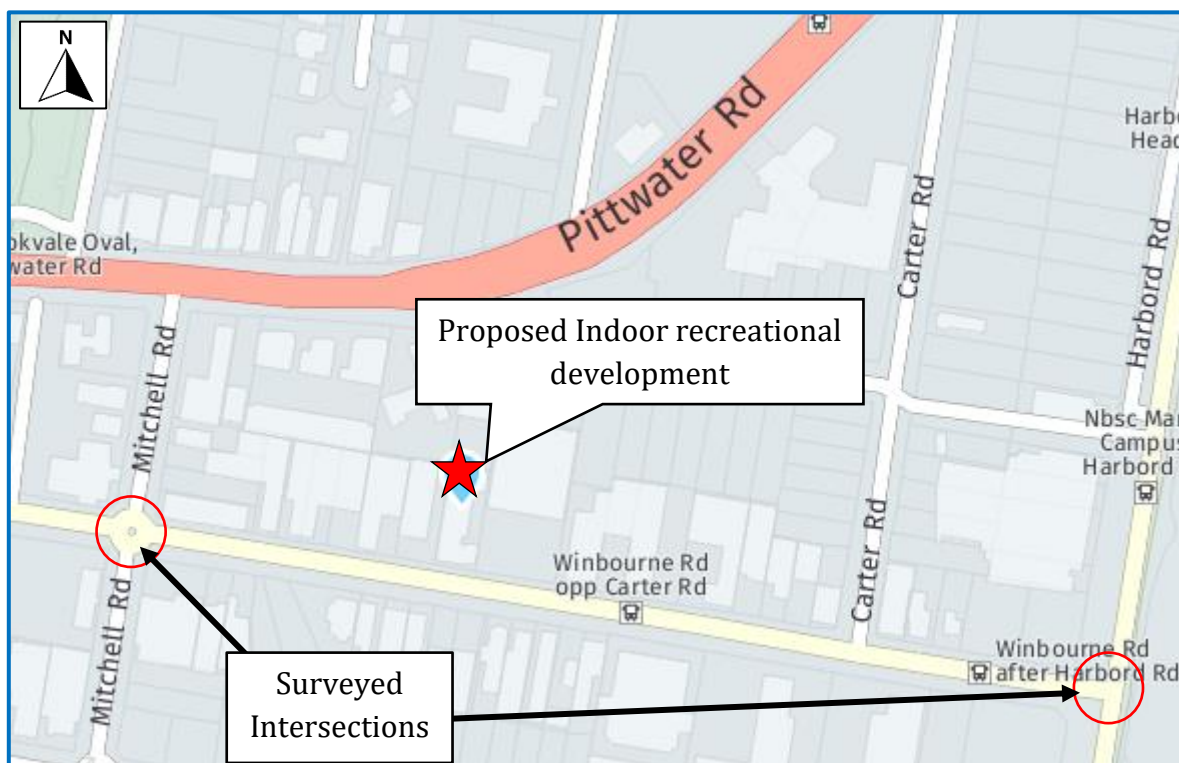


Figure 2: Location of the Indoor recreational site on Aerial and Surveyed Intersections

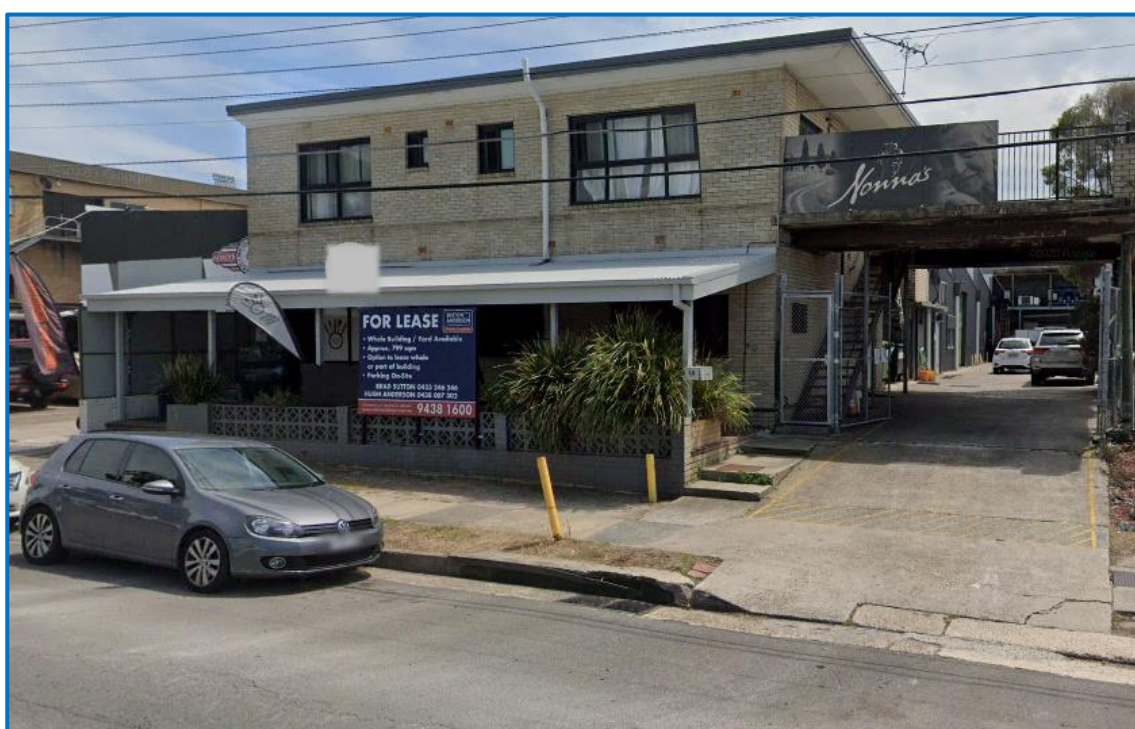


Figure 3: Site Frontage at Winbourne Road

2.2. Road Network

Winbourne Road is a collector road with one lane of traffic each way and a sign-posted speed limit of 60km/hr near the site. Winbourne Road runs in an east-west direction near the site and connects Pittwater Road to the west and Harbord Road to the east. Time-unrestricted kerbside parking is permitted on both sides of the Road. Figure 4a presents a photograph of Winbourne Road.

Mitchell Road is a collector road with one lane of traffic each way and a marked speed limit of 50km/hr. Mitchell Road runs in a north-south direction near the site and connects Pittwater Road to the north and Wattle Road to the south. Time-unrestricted kerbside parking is permitted on both sides of the Road. Figure 4b shows a photograph of Mitchell Road.

Harbord Road is a collector road with two lanes of traffic each way and a sign-posted speed limit of 60 km/hr near Winbourne Road. The road runs in a north-south direction and connects Pittwater Road to the north and Lawrence Street to the south. Harbord Road near Winbourne Road is subjected to School Zone speed restrictions on school days. Figure 4c presents a photograph of the intersection of Harbord Road with Winbourne Road.



Figure 4a: Winbourne Road (Looking West)

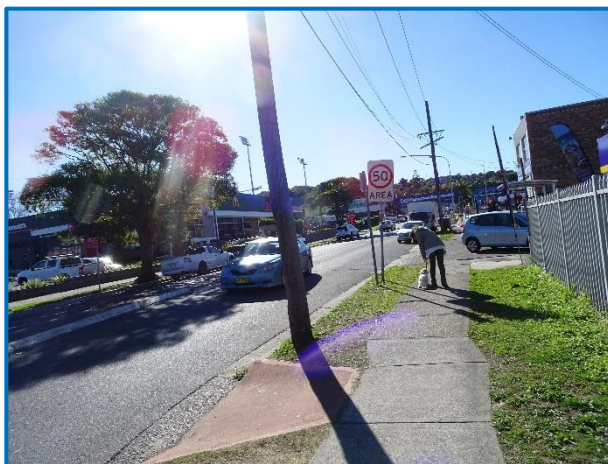


Figure 4b: Mitchell Road (Looking North)



Figure 4c: Intersection of Harbord Road/Winbourne Road

2.3. Public Transport

Bus Service

The walking catchment for bus services generally includes all areas within a 400-metre radius of a bus stop. The nearest bus stop to the indoor recreational site is located 60 metres to the east of the site on the Winbourne Road. This stop is serviced by bus 176x, 177x and 177. Bus 176x and 177x runs in peak hours to provide express transportation between Dee Why to Sydney CBD. Bus route 177 runs during daytime, providing transportation between Dee Why, North Curl Curl and Brookvale.

The proximity of nearby bus stop and the route is given in Figure 5.

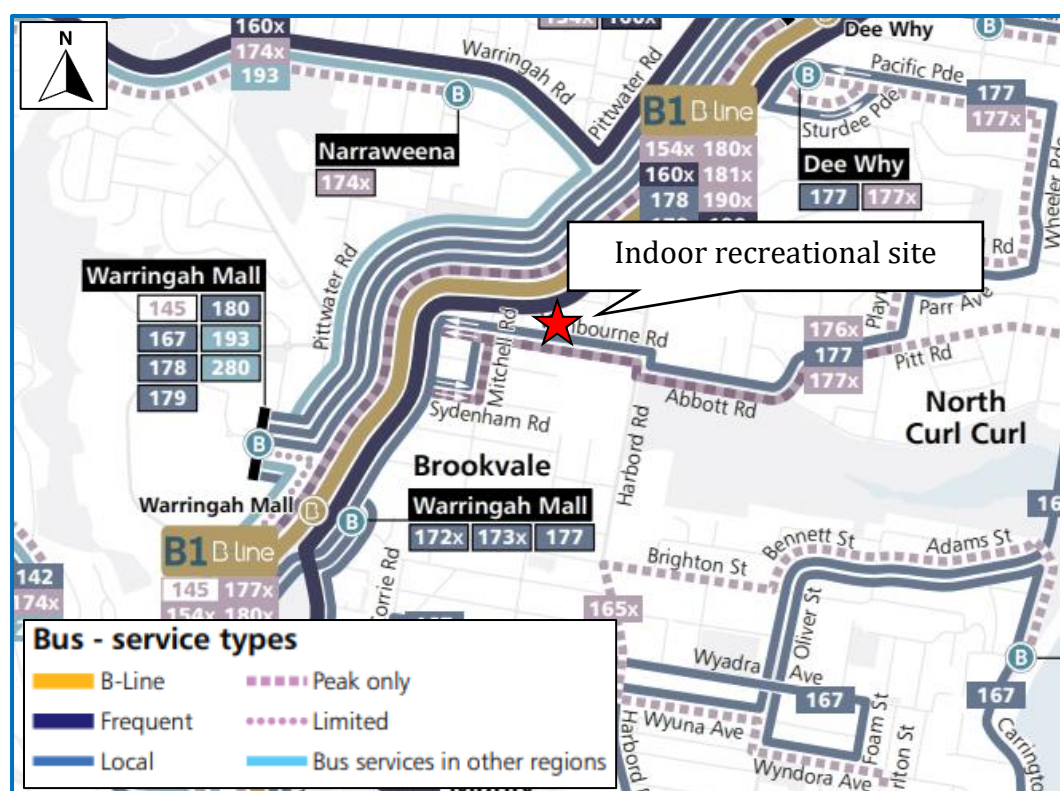


Figure 5: Location of the Indoor recreational site in Relation to the Public Transport

2.4. Intersection Description

As part of the traffic impact assessment, the performance of two nearby intersections was surveyed and assessed:

- ➡ Roundabout intersection of Mitchell Road with Winbourne Road
- ➡ Signalised intersection of Harbord Road with Winbourne Road

External traffic travelling to and from the development is likely to travel through the intersection mentioned above.

The roundabout intersection of Mitchell Road with Winbroune Road is a four-leg intersection with one circulation lane. Figure 6a presents the layout of the intersection using SIDRA – an industry standard intersection software. The number on the median island represents the diameter in metres. Figure 6b presents an aerial view of this intersection.

The signalised intersection of Harbord Road with Winbourne Road is a three-leg intersection with all movements permitted. Signalised pedestrian crossings are provided for all legs. Figure 7a presents the layout of the intersection using SIDRA. The number on the lane represents the length of a short lane in metres. Figure 7b presents an aerial view of this intersection.

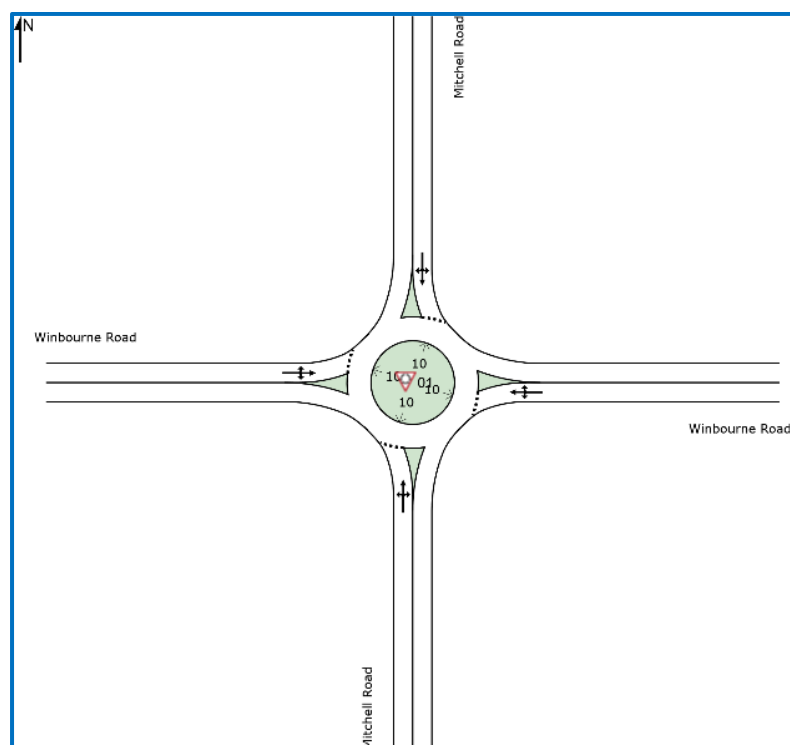


Figure 6a: Roundabout of Mitchell Road with Winbroune Road (SIDRA)



Figure 6b: Roundabout of Mitchell Road with Winbroune Road (aerial)

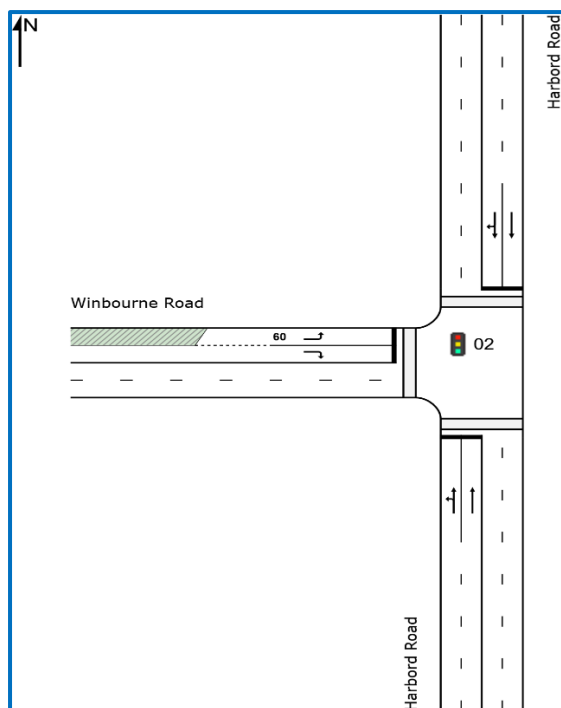


Figure 7a: Signalise intersection of Harbord Road with Winbourne Road (SIDRA)



Figure 7b: Signalise intersection of Harbord Road with Winbourne Road (aerial)

2.5. Existing Traffic Volume

In order to assess the road network performance in the locality, traffic counts were undertaken in June 2021 for the intersection of Mitchell Road with Winbourne Road and the intersection of Harbord Road with Winbourne Road. Traffic volumes for Weekday PM peak hour: 5 pm to 6 pm and Saturday Midday peak hour: 12:00 pm to 1:00 pm are recorded. *The weekday 5pm to 6pm is the PM peak hour for the indoor recreational development.*

The weekday PM peak hour represents the peak arrival hour for customers leaving work and arriving at the indoor recreational facility and with the highest background traffic. Similarly, the Saturday midday to 1pm peak hour is expected to be the highest arrivals on a Saturday during the day with background traffic.

The following Figures present the traffic volumes in vehicles for the weekday peak hours.

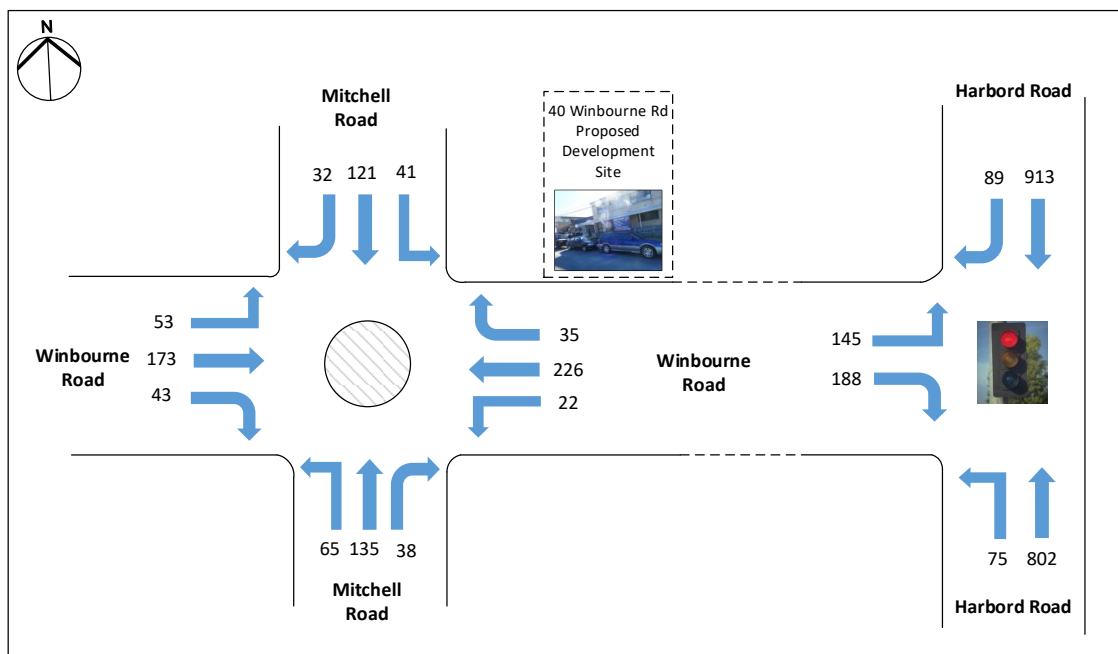


Figure 8a: Existing Weekday Traffic Volumes Weekday PM Peak Hour

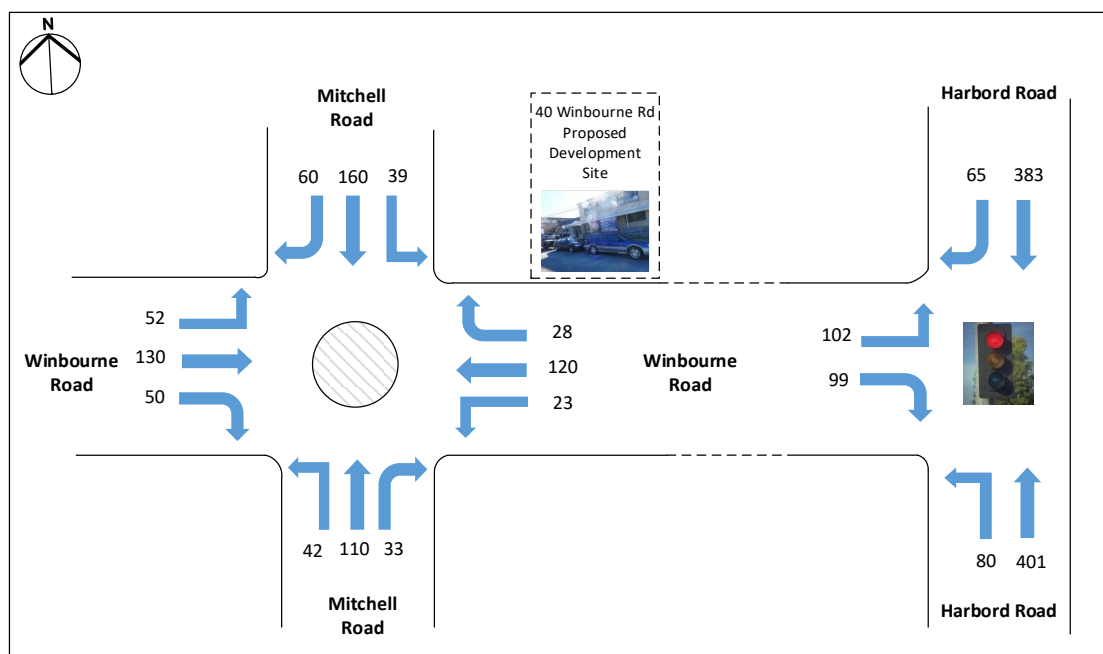


Figure 8b: Existing Saturday Traffic Volumes Weekday PM Peak Hour

2.6. Intersection Assessment with Existing Traffic Volume

An intersection assessment has been undertaken for:

- ➡ Roundabout intersection of Mitchell Road with Winbroune Road
- ➡ Signalised intersection of Harbord Road with Winbourne Road

The existing intersection operating performance was assessed using the SIDRA software package (version 9) to determine the Degree of Saturation (DS), Average Delay (AVD in seconds) and Level of Service (LoS) at each intersection. The SIDRA program provides Level of Service Criteria Tables for various intersection types. The key indicator of intersection performance is Level of Service, where results are placed on a continuum from 'A' to 'F', as shown in Table 1.

LoS	Traffic Signal / Roundabout	Give Way / Stop Sign / T-Junction control
A	Good operation	Good operation
B	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	Satisfactory	Satisfactory, but accident study required
D	Operating near capacity	Near capacity & accident study required
E	At capacity, at signals incidents will cause excessive delays.	At capacity, requires other control mode
F	Unsatisfactory and requires additional capacity, Roundabouts require other control mode	At capacity, requires other control mode

Table 1: Intersection Level of Service

The Average Vehicle Delay (AVD) provides a measure of the operational performance of an intersection as indicated below, which relates AVD to LOS. The AVD's should be taken as a guide only as longer delays could be tolerated in some locations (i.e., inner city conditions) and on some roads (i.e., minor side street intersecting with a major arterial route). For traffic signals, the average delay over all movements should be taken. For roundabouts and priority control intersections (sign control) the critical movement for level of service assessment should be that movement with the highest average delay.

LoS	Average Delay per Vehicles (seconds/vehicle)
A	Less than 14
B	15 to 28
C	29 to 42
D	43 to 56
E	57 to 70
F	>70

Table 2: Intersection Average Delay (AVD)

The degree of saturation (DS) is another measure of the operational performance of individual intersections. For intersections controlled by traffic signals both queue length and delay increase rapidly as DS approaches 1. It is usual to attempt to keep DS to less than 0.9. Degrees of Saturation in the order of 0.7 generally represent satisfactory intersection operation. When DS exceed 0.9 queues can be anticipated.

The results of the intersection analysis are as follows:

Intersection/ Performance criteria	Weekday PM Peak Hour Existing	Saturday Midday Peak Hour Existing
Mitchell Road/Winbourne Road		
LoS	A	A
AVD	6.9	6.8
DS	0.286	0.268
Harbord Road/Winbourne Road		
LoS	C	B
AVD	30.6	18.2
DS	0.832	0.655

Table 3: Existing Intersection Performances

As presented in Table 3, the intersection of Mitchell Road with Winbourne Road is operating at excellent level of service while the intersection of Harbord Road with Winbourne Road is operating at acceptable level of services for the peak assessed peak hours. Both intersections have spare capacity to accommodate additional traffic.

2.7. On-street Parking Survey

A (public) parking survey was undertaken of Winbourne Road between Mitchell Road and Harbord Road for the weekday and a Saturday to assess the available vacant car spaces. The proposed indoor recreational development will rely on the existing on street parking spaces on the nearby streets to accommodate customer parking demand.

A parking and occupancy survey has been conducted for the on-street parking spaces located on Winbourne Road that are within a reasonable walking distance to the site (and not an exhaustive survey of the Brookvale area). The survey was undertaken on the Friday and Saturday of the first week of June.

Figure 10 presents a parking survey map indicating the extent of this survey and locations of different parking zones. The survey results are presented in Table 4 and 5 for the weekday and Saturday respectively. The survey showed there are a low number of vacant car spaces during the day and a large number of vacant car spaces after 5pm where many of the nearby business are closed.

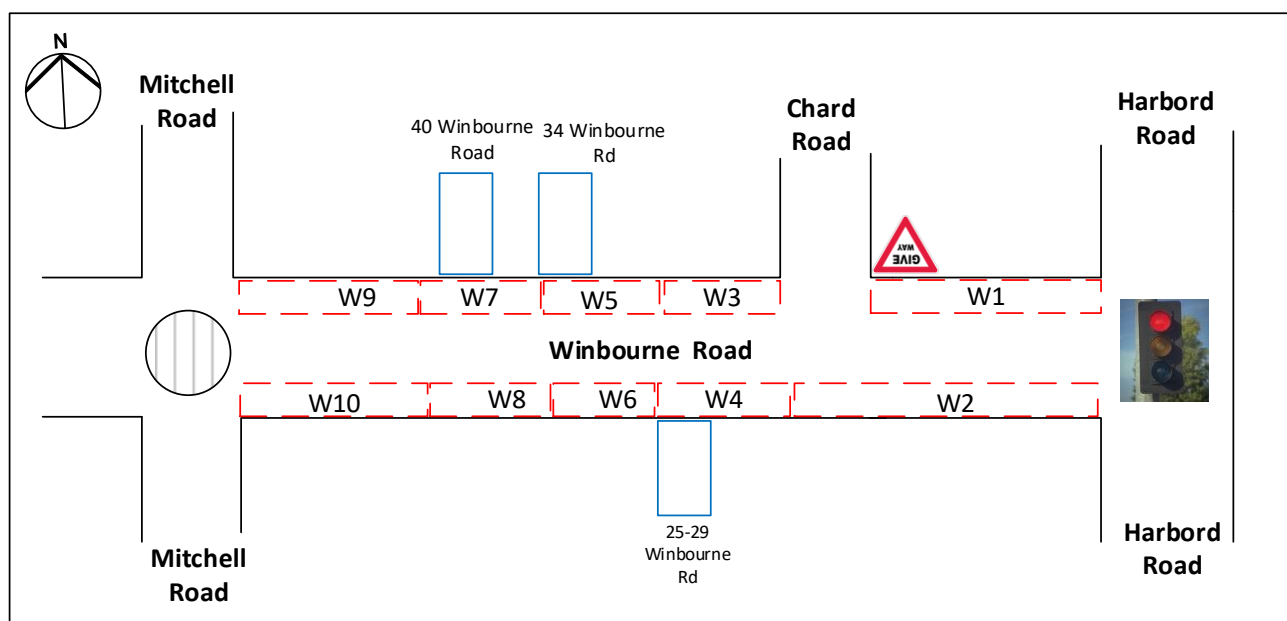


Figure 10: On-street Parking Survey Map

			Weekday Occupancy					
Section	Restriction	Car Spaces	Midday	1pm	3pm	5pm	6pm	8pm
W1	NO TIME RESTRICTION	6	6	6	5	5	3	0
W2		6	5	5	4	4	3	2
W3		5	5	5	4	3	1	0
W4		4	4	4	4	3	2	1
W5		7	6	7	5	5	3	2
W6		5	5	5	5	4	1	2
W7		5	5	5	5	3	2	1
W8		4	4	4	3	3	2	0
W9		9	8	8	9	6	4	3
W10		9	8	9	6	5	3	2
Total		60	56	58	50	41	24	13
Vacant Spaces			4	2	10	19	36	47
Vacancy Rate			7%	3%	17%	32%	60%	78%

Table 4: Weekday (Friday) On-street Parking Survey Results

			Saturday Occupancy							
Section	Restriction	Car Spaces	10am	11am	Midday	1pm	3pm	5pm	6pm	8pm
W1	NO TIME RESTRICTION	6	3	5	5	5	4	4	2	2
W2		6	2	5	5	5	3	4	2	1
W3		5	3	3	3	3	3	2	0	0
W4		4	3	4	4	4	4	2	2	1
W5		7	4	4	5	5	3	2	2	0
W6		5	4	4	4	4	5	3	0	0
W7		5	2	3	5	5	5	4	1	0
W8		4	2	2	3	2	3	2	2	0
W9		9	3	5	5	5	6	5	2	1
W10		9	5	5	6	4	5	4	2	2
Total		60	31	40	45	42	41	32	15	7
Vacant Spaces			29	20	15	18	19	28	45	53
Vacancy Rate			48%	33%	25%	30%	32%	47%	75%	88%

Table 5: Saturday On-street Parking Survey Results

2.8.Existing Conditions

The assessment of existing conditions showed that the nearby intersections perform well with spare capacity.

The proposed indoor recreational facility has good access to public transport.

The on-street public parking showed a low number of vacant car spaces during the day. There are a large number of vacant car spaces available after 5pm.

3. PROPOSED INDOOR RECREATIONAL DEVELOPMENT

The proposed indoor recreational development is an axe throwing business named ‘Kiss My Axe’ (www.kissmyaxe.com.au). There is an existing business located in Alexandria. Information on customer arrivals,, departures and the car parking demand for the weekday and weekend for the daytime and evening period.

The activity of throwing an axe for recreational activity is a “rare” landuse and information is not commonly known.

A description of the development for which approval is presented below:

3.1. Facility, Parking and Access

- ➔ A total area of 443 m² on the ground level including reception area, toilets, bin storage and axe throwing lanes/bays
- ➔ 4 on-site parking spaces for staff
- ➔ Access to the parking area is via a driveway runs off Winbourne Road

3.2. Operation Details

Operation Hours

Weekdays 9:00am – 11:00pm with 2 staff on site

Saturday 9:00am – 11:00pm with 4 staff on site

Sunday 10:00am – 10:00pm with 4 staff on site

Public Holidays 9:00am – 10:00pm with 4 staff on site

Sessions

- ➔ 2-hour sessions start at 10:00 am, 12:00 pm, 2:30 pm, 5:00 pm and 7:30 pm
- ➔ 1-hour sessions start from 10:00 am and runs every hour until 8:30 pm

3.3. Patronage details

Information of the patronage has been obtained from the existing “Kiss My Axe” business located in Alexandria. The patronage details are presented below:

Number of Patrons Expected

Monday 5 during evening sessions

Tuesday 15 during evening sessions

Wednesday 15 during evening sessions

Thursday 30 during evening sessions

Friday 40 during evening sessions

Saturday 120 across the day

Sunday 50 across the day

Figure 9a shows the number of average patrons of each session for 1-hour and 2-hour sessions respectively. Figure 9b is provided by the client based on their previous experiences, showing the distribution of patrons throughout the day for different 2-hour sessions.

The Figures show that the average time duration is approximately 1 hour and 45 minutes.

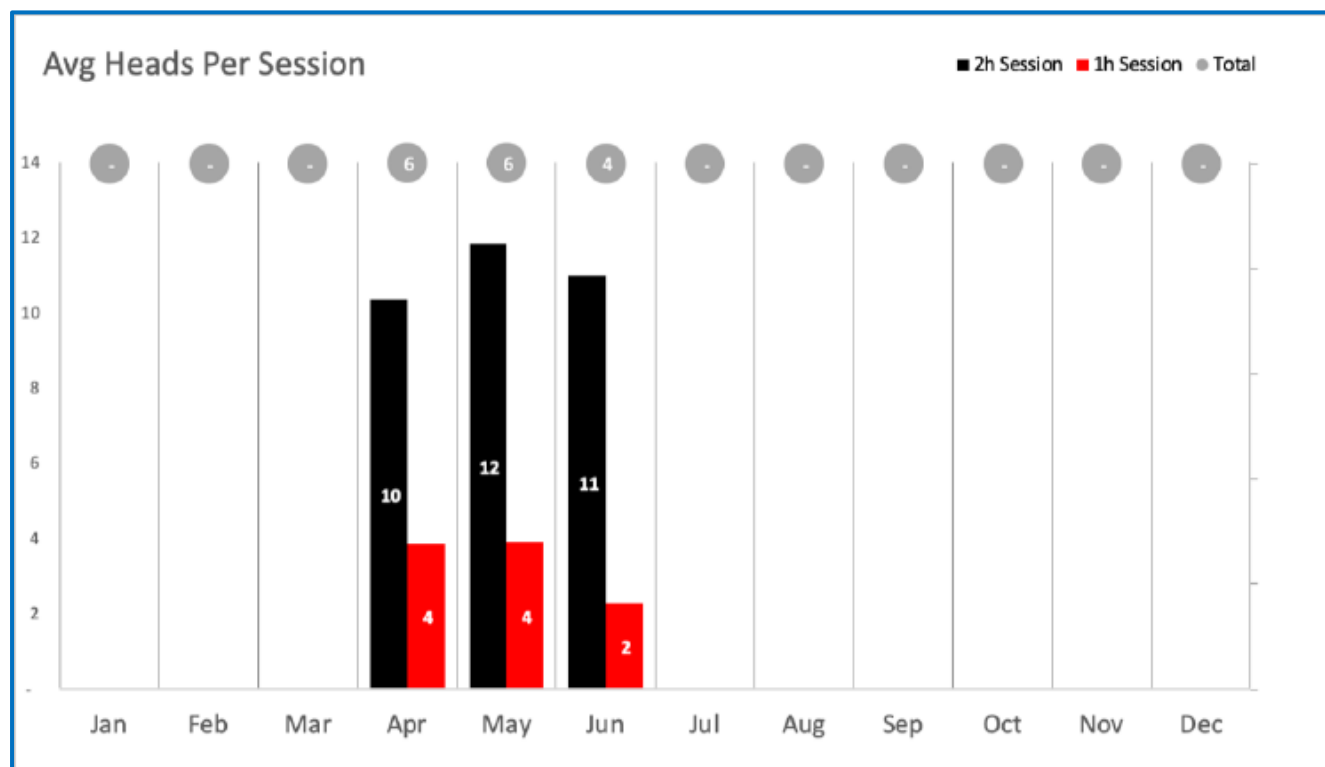


Figure 9a: Average patrons of each session for 1-hour and 2-hour sessions

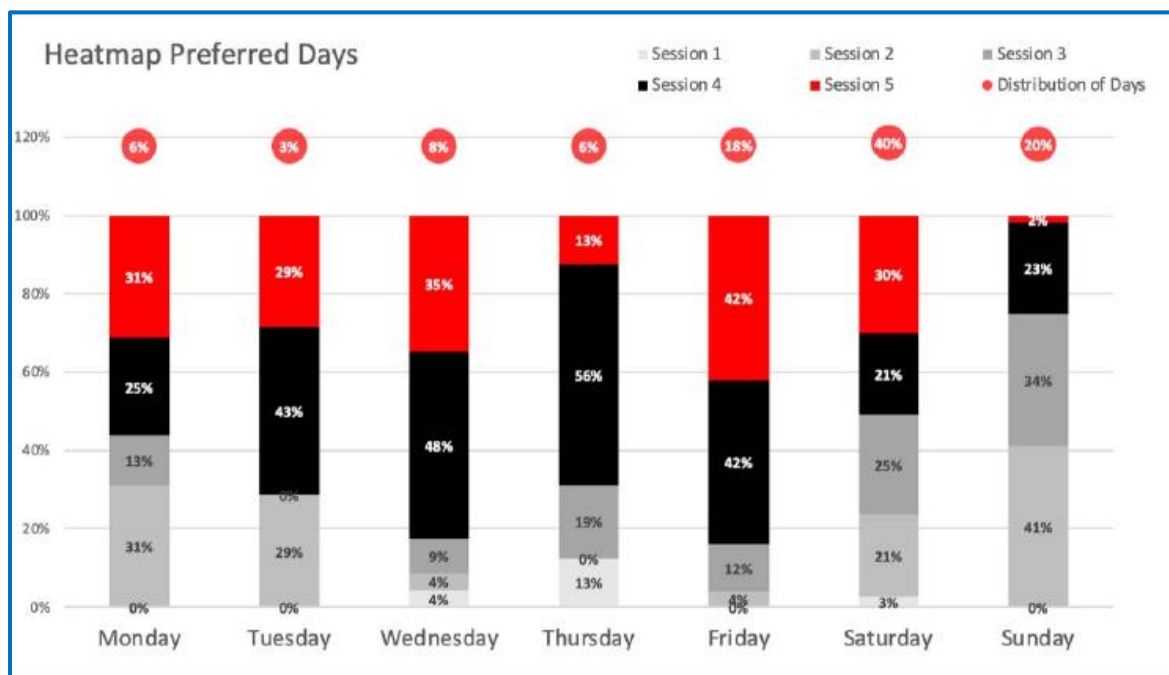


Figure 9b: Distribution of patrons throughout the day for 2-hour sessions

There are four on-site car spaces for staff. The occupancy of the staff car spaces will be subject to a traffic management plan.

A full scaled plan of the proposed indoor recreational development is provided as part of the Development Application.

4. PARKING REQUIREMENTS

4.1. Car Parking Rate

The car parking rates for an indoor axe throwing facility is not specified in either Warringah Development Control Plan 2011 or RTA Guide to Traffic Generating Developments 2002. The parking assessment is based on the existing “Kiss My Axe” business in Alexandria for visitor and staff parking demand..

Some of the details of the car parking demand are presented Section 3.2 of this report. In summary, the following considerations are made while determining the number of car parking spaces required:

- ➡ According to the average patron numbers provided by the client, the 2-hour session will generate more car parking demand compare with the 1-hour sessions and hence will be assessed as the worst-case scenario
- ➡ Staff will use their own cars to commute
- ➡ The client has advised that the average car occupancy rate is 2.5 patrons per car. This rate generally holds true for an indoor recreational development based on significant previous experiences, taking into account of carpooling and patrons arriving in family, work and social groups. Visitors to “Kiss my Axe” are rarely people going by themselves.
 - The above 2.5 patrons per car takes into account that a low proportion of customers will arrive via the bus (between 5 to 10 percent with a higher number during the day and a lower number for the evening)

Hence, the following car parking rates are adopted for the purpose of this assessment:

- ➡ 1 space for each staff
- ➡ 1 space for each 2.5 patrons

4.2. Adequacy of Car Parking Provision

The adequacy of car parking provision is assessed for the busiest hours during weekdays and weekends. As previously presented in Section 3.2, the expected peak period will be after 5 pm on Friday and from 12 pm to 9:30 pm on Saturday.

4.2.1. Friday Evening

The highest attendance for a weekday is on Friday evening where many visitors have ended their working week and wish to socialise on Friday night.

The owners of “Kiss my Axe” in Alexandria has advised that the total number of patrons for Friday evening sessions is 40. As presented in Figure 9b: Distribution of patrons throughout the day for 2-hour sessions, the 5 pm session and 7:30 pm session both take up 42% of the total number of patrons of the day. Hence, there will be 20 patrons attending the 5 pm and 7:30 pm session respectively.

The car parking rate presented in Section 4.1 of this report is applied to the number of patrons and staff, the number of car parking spaces required for each session is therefore calculated and presented in Table 6a below:

Use	Time	Number of Patron/ Staff	Car Parking Rate	Car Parking Spaces Required	Car Spaces Provided/available	Type of Parking
Patron	Session 4 5:00 - 7:00	20	1 space per 2.5 patrons	8	19	On-Street
	Session 5 7:30 - 9:30	20		8	36	
Staff	Whole Day	2	1 space per staff	2	4	On-Site

Table 6a: Summary of Friday Evening Car Parking Requirements

As presented in Table 6a, the Friday evening sessions will both generate a parking demand of 8 spaces. The survey result shows that there are at least 19 and 36 car spaces available on Winbroune Road at 5 pm and 7:30 pm. Hence, there are sufficient number of on-street parking spaces to accommodate the patron car parking demand. The staff parking demand can be met on site with 4 spaces proposed versus 2 spaces required.

The provision of car parking spaces is considered as acceptable for the Friday evening peak scenario.

4.2.2. Saturday

As stated in Section 3.2 of this report, there will be 120 patrons maximum on Saturday. Three percent of the patrons will attend the 10 am session and 21%, 25%, 21%, 30% for the 12 pm, 2:30 pm, 5pm and 7:30 pm sessions respectively.

The car parking rate presented in Section 4.1 of this report is applied to the number of patrons and staff, the number of car parking spaces required for each session is therefore calculated and presented in Table 6b below:

Use	Session	Time	Number of Patrons/ Staff	Car Parking Rate	Car Parking Spaces Required	Parking Spaces Available	Type of Parking
Patron Parking	1	10:00 - 12:00	4	1 space per 2.5 patrons	2	29	On-Street
	2	12:00 - 2:00	25		10	15	
	3	2:30 - 4:30	36		14	18	
	4	5:00 - 7:00	25		10	28	
	5	7:30 - 9:30	36		14	45	
Staff Parking	--	Whole Day	4	1 space per staff	4	4	On-Site

It can be evident from Table 6b that the Saturday sessions will generate 2, 10, 14, 10 and 14 patron parking demand versus 29, 15, 18, 28, 45 parking spaces available on-street for each session respectively. Hence, there are sufficient number of on-street parking spaces to accommodate the patron car parking demand. The staff parking demand can be met on site with 4 spaces proposed versus 4 spaces required.

The provision of car parking spaces is considered as acceptable for the Saturday peak scenario.

4.3. Bicycle and Motorcycle Parking

The Warringah DCP 2011 does not specify bicycle and motorcycle parking rates for an indoor recreational development. The proposed indoor recreational development is therefore not required to provide any bicycle or motorcycle parking space on-site.

5. TRAFFIC GENERATION AND IMPACT

5.1. Proposed Traffic Generation

The RMS publication “RTA’s Guide to Traffic Generating Developments (2002)” provides advice on the traffic generating potential of different land uses. The RTA Guide document does not cover an indoor axe throwing facility. Determination of the traffic generation will be based on a “first principal analysis” about the number of car spaces provided and number of patrons

It is reasonable to assume that the peak trip generation will occur when two sessions overlap (i.e., customers departing from the previous session overlapped with customers arriving for the next consecutive session).

5.1.1. Weekday PM

For the weekday PM peak hour, the maximum number of trips is expected to occur before session 4 starts on Friday. Assuming all patrons arrives on site within 15 minutes of the starting time and the patrons from the previous session leave the site within 15 minutes of finishing, the expected trip generation during the network peak hour (4:45 – 5:45) is:

$$\rightarrow 20 + 6 \text{ (number of patrons for session 3 on Friday)} = 26 \text{ trips}$$

5.1.2. Saturday midday

Using the same analysis methodology, the expected number of trips generated in the Saturday midday peak hour (12 pm – 1 pm) is:

$$\rightarrow 25 + 4 = 29 \text{ trips}$$

5.1.3. Staff Trip

Staff arrive on site before the opening time and leave after the close of business. Hence, 2 staff trips will be generated in the weekday morning peak hour. 2 additional staff trips are considered as insignificant comparing with the number of trips generated by patrons and will not have any critical impact on the road network. Hence, the additional staff trip for the morning peak hour is not assessed using modelling software.

Staff will not generate any additional trip in the weekday PM and Saturday midday peak period.

5.2. Trip Distribution

The proposed recreational facility is a modest trip generator in both weekday PM peak hour and Saturday midday peak hour.

The predicted trips are distributed to the road network as:

- 20 destination trips and 6 origin trips for the weekday PM peak hour
- 25 destination trips and 4 origin trips for the Saturday midday peak hour

5.3. Future Traffic Volume

The additional development trips are assigned onto the local traffic network. The following figures present the future traffic volume with the development trips (in red for origin trips and blue for destination trips) for the weekday PM peak hour and Saturday midday peak hour.

The additional development trips represent a small proportion of the existing traffic volumes.

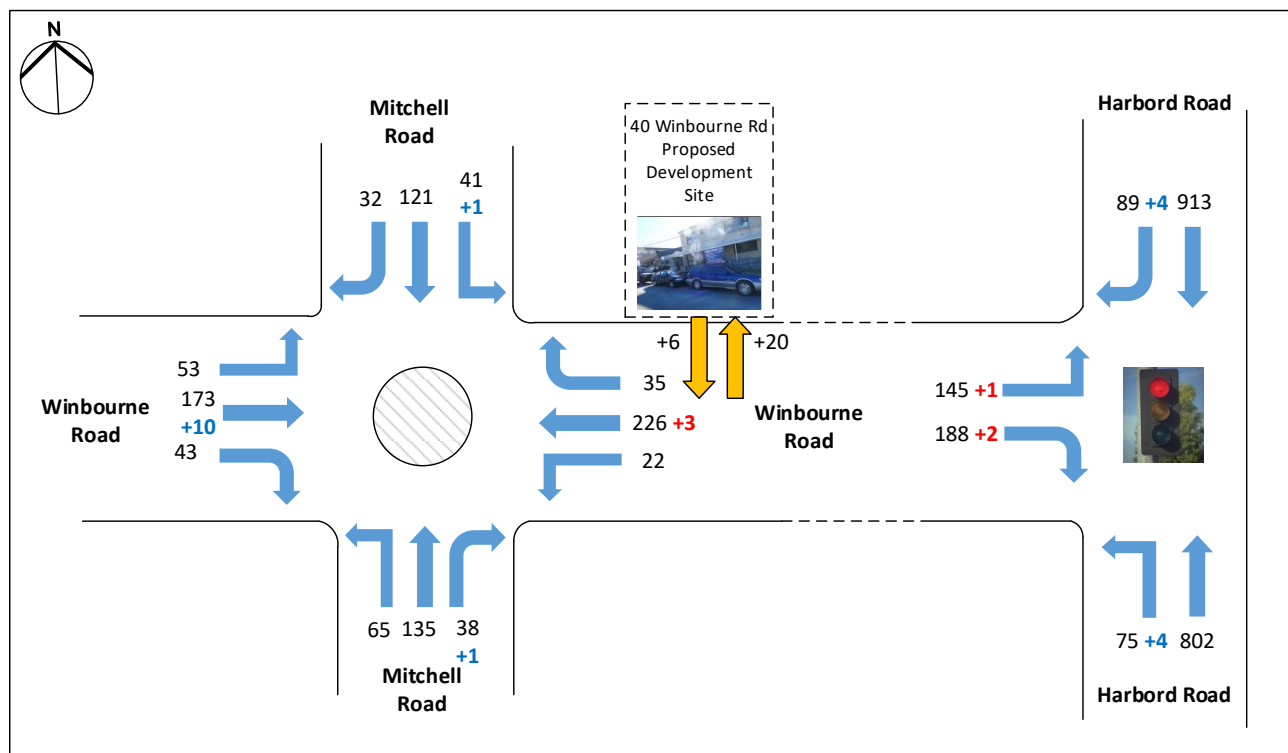


Figure 11a: Existing Weekday Traffic Volumes with Indoor recreational traffic Weekday PM Peak Hour

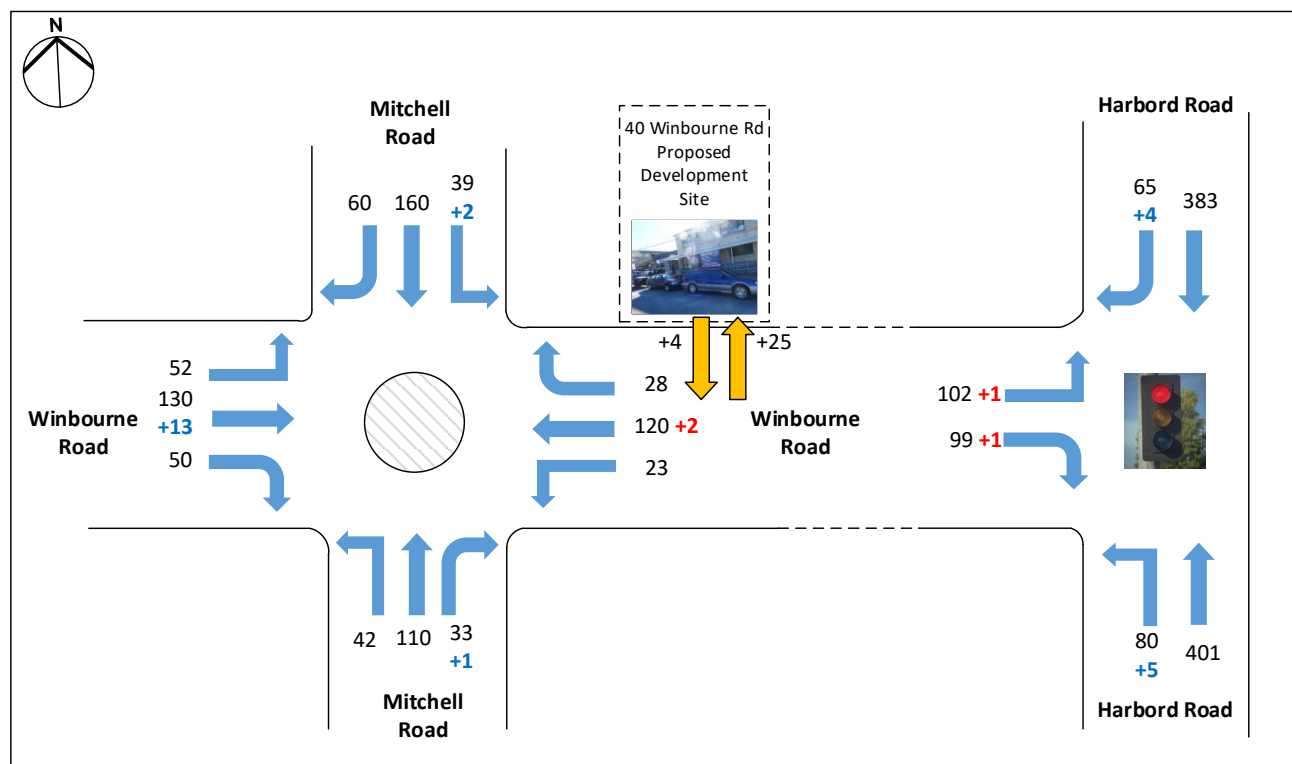


Figure 11b: Existing Weekday Traffic Volumes with Indoor recreational traffic Saturday Midday Peak Hour

5.4. Traffic Impact

This section assesses the following intersections for the existing traffic with the indoor recreational traffic. The results of the intersection assessment are as follows:

Intersection/ Performance Criteria	Performance with Existing Traffic		Projected Performance with Existing and Indoor recreational traffic	
	PM Peak Hour	Saturday Midday Peak Hour	PM Peak Hour Projected	Saturday Midday Peak Hour Projected
Mitchell Road/Winbourne Road				
LoS	A	A	A	A
AVD	6.9	6.8	6.9	6.8
DS	0.286	0.268	0.288	0.274
Harbord Road/Winbourne Road				
LoS	C	B	C	B
AVD	30.6	18.2	30.9	18.3
DS	0.832	0.655	0.838	0.662

Table 7: Projected intersection performance with indoor recreational traffic

As presented in Table 6 above, the additional trips generated by the proposed indoor recreational development have minimum impact on the intersection performances in both weekday PM and Saturday midday peak hours. The LoS, AVD and DS of each intersection are not significantly affected by the addition of indoor recreational traffic.

The traffic impacts of the proposed indoor recreational development are therefore considered acceptable.

The full SIDRA results are presented in Appendix B for the future conditions with the indoor recreational traffic.

6. ACCESS INTERNAL DESIGN ASPECTS

The review of the internal parking area is undertaken with references are made to AS2890.1, AS2890.6 and Council's Development Control Plan for compliance.

There are four on-site car spaces for staff. The occupancy of the staff car spaces will be subject to a traffic management plan.

6.1.Site Access and Driveway

Vehicular access to the on-site parking area is via the existing driveway runs off Winbourne Road. The details of the existing driveway are as follows:

- ➔ Width of the driveway is 3.56 metres
- ➔ Gradients on the existing driveway are less than 5 percent

6.2. Parking

The details of the car parking area are as follows:

- ➔ The car parking aisle is 3.6 metres wide minimum.
- ➔ The general parallel car spaces are 2.4 metres wide and 6.1 metres long at minimum
- ➔ Since the spaces are designated for staff, a parking management plan will be in place to facilitate staff parking.

6.3.Sight Distance

The car driver's sight distance requirement to enter the external road is stated in Figure 3.2 of AS2890.1.

The sight distance varies according to the speed of the external road. Winbourne Road has a speed limit of 60km/hr.

The minimum sight distance required is 65 metres. The minimum vehicle sight distance is met.

The pedestrian sight distance triangle is met as well.

In summary, the internal configuration of the car park and loading areas has been designed in accordance with AS 2890.1 and AS 2890.2. It is however envisaged that a condition of consent would be imposed requiring compliance with these standards such that the detailed design of the proposed car parking areas can be dealt with prior to the issue of Construction Certificate.

7. CONCLUSIONS

This traffic and parking impact assessment reports relates to a proposed indoor recreational development at 40 Winbourne Road in Brookvale named “Kiss My Axe.” Based on the analysis and discussions presented in this report, the following conclusions are made:

- ➔ The indoor recreational site is located in a light industrial with some access to public transport service. Vacant on-street parking spaces can be located on Winbourne Road.
- ➔ The surrounding intersections currently operates at acceptable level of services.
- ➔ A parking survey has been conducted for on-street parking in the vicinity of the site and the results show that there are at least 19 spaces after 5 pm on weekdays and at least 15 spaces on Saturday.
- ➔ The proposed provision of car parking spaces is considered as acceptable with the staff parking demand to be accommodate on site and patron parking demand to be accommodate on street.
- ➔ The proposed indoor recreational development is not required to provide parking for bicycle or motorcycle
- ➔ The proposed indoor recreational development is expected to generate modest number of additional trips in the weekday PM peak hour and Saturday Midday peak hour.
- ➔ The intersection assessment the additional trips can be accommodated in the nearby intersections without significantly affecting the performance of any turn movement, approach arm or the overall intersection. The traffic impacts of the proposed indoor recreational development are therefore considered acceptable.
- ➔ A parking management plan will be applied to the staff car spaces.

There are no traffic engineering reasons why a development consent for the proposed indoor recreational development at 40 Winbourne Road in Brookvale named “Kiss My Axe.”, should be refused.

APPENDIX A

INTERSECTION ASSESSMENT FOR EXISTING TRAFFIC

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mitchell Road												
1	L2	68	0.0	0.267	6.6	LOS A	1.6	11.2	0.55	0.66	0.55	41.9
2	T1	142	0.0	0.267	6.8	LOS A	1.6	11.2	0.55	0.66	0.55	18.0
3	R2	40	0.0	0.267	10.2	LOS A	1.6	11.2	0.55	0.66	0.55	48.3
Approach		251	0.0	0.267	7.3	LOS A	1.6	11.2	0.55	0.66	0.55	28.4
East: Winbourne Road												
4	L2	23	0.0	0.286	5.9	LOS A	1.7	12.2	0.46	0.59	0.46	47.8
5	T1	238	0.0	0.286	6.2	LOS A	1.7	12.2	0.46	0.59	0.46	51.0
6	R2	37	0.0	0.286	9.5	LOS A	1.7	12.2	0.46	0.59	0.46	46.6
Approach		298	0.0	0.286	6.5	LOS A	1.7	12.2	0.46	0.59	0.46	50.3
North: Mitchell Road												
7	L2	43	0.0	0.210	6.2	LOS A	1.2	8.4	0.49	0.62	0.49	47.6
8	T1	127	0.0	0.210	6.5	LOS A	1.2	8.4	0.49	0.62	0.49	35.1
9	R2	34	0.0	0.210	9.8	LOS A	1.2	8.4	0.49	0.62	0.49	43.4
Approach		204	0.0	0.210	7.0	LOS A	1.2	8.4	0.49	0.62	0.49	40.7
West: Winbourne Road												
10	L2	56	0.0	0.277	6.0	LOS A	1.7	11.9	0.48	0.61	0.48	42.3
11	T1	182	0.0	0.277	6.2	LOS A	1.7	11.9	0.48	0.61	0.48	51.0
12	R2	45	0.0	0.277	9.6	LOS A	1.7	11.9	0.48	0.61	0.48	40.9
Approach		283	0.0	0.277	6.7	LOS A	1.7	11.9	0.48	0.61	0.48	48.6
All Vehicles		1036	0.0	0.286	6.9	LOS A	1.7	12.2	0.49	0.62	0.49	43.5

Table A1: Weekday Roundabout Intersection Performance of Mitchell Road with Winbourne Road for the Weekday PM Peak Hour

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road												
1	L2	79	0.0	0.832	36.9	LOS C	17.0	119.3	1.00	1.00	1.22	30.5
2	T1	844	0.0	0.832	31.4	LOS C	17.2	120.2	1.00	1.00	1.22	32.3
Approach		923	0.0	0.832	31.8	LOS C	17.2	120.2	1.00	1.00	1.22	32.1
North: Harbord Road												
8	T1	961	0.0	0.827	29.0	LOS C	19.2	134.2	0.99	0.98	1.17	33.4
9	R2	94	0.0	0.827	34.5	LOS C	19.0	133.2	0.99	0.99	1.17	39.1
Approach		1055	0.0	0.827	29.5	LOS C	19.2	134.2	0.99	0.98	1.17	34.1
West: Winbourne Road												
10	L2	153	0.0	0.151	14.1	LOS A	2.6	18.1	0.53	0.71	0.53	47.4
12	R2	198	0.0	0.829	44.2	LOS D	7.6	53.5	1.00	0.96	1.37	25.7
Approach		351	0.0	0.829	31.1	LOS C	7.6	53.5	0.79	0.85	1.00	34.7
All Vehicles		2328	0.0	0.832	30.6	LOS C	19.2	134.2	0.96	0.97	1.16	33.4

Table A2: Weekday Signalised Intersection Performance of Harbord Road with Winbourne Road for the Weekday PM Peak Hour

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mitchell Road												
1	L2	44	0.0	0.191	5.9	LOS A	1.1	7.5	0.44	0.59	0.44	42.5
2	T1	116	0.0	0.191	6.1	LOS A	1.1	7.5	0.44	0.59	0.44	18.2
3	R2	35	0.0	0.191	9.4	LOS A	1.1	7.5	0.44	0.59	0.44	48.8
Approach		195	0.0	0.191	6.7	LOS A	1.1	7.5	0.44	0.59	0.44	28.3
East: Winbourne Road												
4	L2	24	0.0	0.187	6.3	LOS A	1.0	7.3	0.49	0.62	0.49	47.5
5	T1	126	0.0	0.187	6.5	LOS A	1.0	7.3	0.49	0.62	0.49	50.8
6	R2	29	0.0	0.187	9.8	LOS A	1.0	7.3	0.49	0.62	0.49	46.3
Approach		180	0.0	0.187	7.0	LOS A	1.0	7.3	0.49	0.62	0.49	49.7
North: Mitchell Road												
7	L2	41	0.0	0.268	6.0	LOS A	1.6	11.2	0.47	0.61	0.47	47.5
8	T1	168	0.0	0.268	6.3	LOS A	1.6	11.2	0.47	0.61	0.47	35.0
9	R2	63	0.0	0.268	9.6	LOS A	1.6	11.2	0.47	0.61	0.47	43.3
Approach		273	0.0	0.268	7.0	LOS A	1.6	11.2	0.47	0.61	0.47	40.2
West: Winbourne Road												
10	L2	55	0.0	0.229	5.7	LOS A	1.3	9.3	0.41	0.58	0.41	42.6
11	T1	137	0.0	0.229	5.9	LOS A	1.3	9.3	0.41	0.58	0.41	51.2
12	R2	53	0.0	0.229	9.2	LOS A	1.3	9.3	0.41	0.58	0.41	41.2
Approach		244	0.0	0.229	6.6	LOS A	1.3	9.3	0.41	0.58	0.41	48.2
All Vehicles		892	0.0	0.268	6.8	LOS A	1.6	11.2	0.45	0.60	0.45	42.4

Table A3: Weekend Roundabout Intersection Performance of Mitchell Road with Winbourne Road for the Saturday Midday Peak Hour

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road												
1	L2	84	0.0	0.655	23.3	LOS B	5.0	35.0	0.97	0.85	1.09	37.4
2	T1	422	0.0	0.655	17.7	LOS B	5.1	35.6	0.97	0.85	1.09	40.0
Approach		506	0.0	0.655	18.7	LOS B	5.1	35.6	0.97	0.85	1.09	39.6
North: Harbord Road												
8	T1	403	0.0	0.609	17.2	LOS B	4.6	32.3	0.96	0.82	1.03	40.5
9	R2	68	0.0	0.609	22.8	LOS B	4.5	31.8	0.96	0.82	1.03	44.5
Approach		472	0.0	0.609	18.0	LOS B	4.6	32.3	0.96	0.82	1.03	41.3
West: Winbourne Road												
10	L2	107	0.0	0.116	11.3	LOS A	1.1	7.9	0.56	0.70	0.56	49.2
12	R2	104	0.0	0.374	23.5	LOS B	2.0	13.9	0.94	0.76	0.94	34.4
Approach		212	0.0	0.374	17.3	LOS B	2.0	13.9	0.75	0.73	0.75	42.5
All Vehicles		1189	0.0	0.655	18.2	LOS B	5.1	35.6	0.93	0.81	1.00	40.8

Table A4: Weekend Signalised Intersection Performance of Harbord Road with Winbourne Road for the Saturday Midday Peak Hour

APPENDIX B

INTERSECTION ASSESSMENT FOR FUTURE CONDITION WITH INDOOR RECREATIONAL TRAFFIC

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mitchell Road												
1	L2	68	0.0	0.269	6.6	LOS A	1.6	11.3	0.55	0.66	0.55	41.8
2	T1	142	0.0	0.269	6.9	LOS A	1.6	11.3	0.55	0.66	0.55	18.0
3	R2	41	0.0	0.269	10.2	LOS A	1.6	11.3	0.55	0.66	0.55	48.2
Approach		252	0.0	0.269	7.3	LOS A	1.6	11.3	0.55	0.66	0.55	28.4
East: Winbourne Road												
4	L2	23	0.0	0.288	5.9	LOS A	1.8	12.4	0.47	0.59	0.47	47.7
5	T1	241	0.0	0.288	6.2	LOS A	1.8	12.4	0.47	0.59	0.47	51.0
6	R2	37	0.0	0.288	9.5	LOS A	1.8	12.4	0.47	0.59	0.47	46.6
Approach		301	0.0	0.288	6.5	LOS A	1.8	12.4	0.47	0.59	0.47	50.3
North: Mitchell Road												
7	L2	44	0.0	0.213	6.3	LOS A	1.2	8.6	0.50	0.63	0.50	47.5
8	T1	127	0.0	0.213	6.5	LOS A	1.2	8.6	0.50	0.63	0.50	35.0
9	R2	34	0.0	0.213	9.9	LOS A	1.2	8.6	0.50	0.63	0.50	43.3
Approach		205	0.0	0.213	7.0	LOS A	1.2	8.6	0.50	0.63	0.50	40.7
West: Winbourne Road												
10	L2	56	0.0	0.287	6.0	LOS A	1.8	12.5	0.49	0.61	0.49	42.3
11	T1	193	0.0	0.287	6.3	LOS A	1.8	12.5	0.49	0.61	0.49	51.0
12	R2	45	0.0	0.287	9.6	LOS A	1.8	12.5	0.49	0.61	0.49	40.9
Approach		294	0.0	0.287	6.7	LOS A	1.8	12.5	0.49	0.61	0.49	48.7
All Vehicles		1052	0.0	0.288	6.9	LOS A	1.8	12.5	0.50	0.62	0.50	43.6

Table B1: Weekday Roundabout Intersection Performance of Mitchell Road with Winbourne Road for the Weekday PM Peak Hour with Indoor recreational traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road												
1	L2	83	0.0	0.836	37.2	LOS C	17.2	120.6	1.00	1.01	1.23	30.3
2	T1	844	0.0	0.836	31.7	LOS C	17.4	121.5	1.00	1.01	1.22	32.1
Approach		927	0.0	0.836	32.2	LOS C	17.4	121.5	1.00	1.01	1.22	32.0
North: Harbord Road												
8	T1	961	0.0	0.830	29.2	LOS C	19.4	135.6	0.99	0.99	1.18	33.3
9	R2	98	0.0	0.830	34.8	LOS C	19.2	134.5	0.99	0.99	1.18	38.9
Approach		1059	0.0	0.830	29.7	LOS C	19.4	135.6	0.99	0.99	1.18	34.0
West: Winbourne Road												
10	L2	154	0.0	0.152	14.1	LOS A	2.6	18.2	0.53	0.71	0.53	47.4
12	R2	200	0.0	0.838	44.7	LOS D	7.8	54.5	1.00	0.97	1.39	25.6
Approach		354	0.0	0.838	31.4	LOS C	7.8	54.5	0.79	0.86	1.01	34.5
All Vehicles		2340	0.0	0.838	30.9	LOS C	19.4	135.6	0.96	0.98	1.17	33.3

Table B2: Weekday Signalised Intersection Performance of Harbord Road with Winbourne Road for the Weekday PM Peak Hour with Indoor recreational traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Mitchell Road												
1	L2	44	0.0	0.193	5.9	LOS A	1.1	7.5	0.44	0.59	0.44	42.5
2	T1	116	0.0	0.193	6.1	LOS A	1.1	7.5	0.44	0.59	0.44	18.2
3	R2	36	0.0	0.193	9.5	LOS A	1.1	7.5	0.44	0.59	0.44	48.8
Approach		196	0.0	0.193	6.7	LOS A	1.1	7.5	0.44	0.59	0.44	28.4
East: Winbourne Road												
4	L2	24	0.0	0.190	6.3	LOS A	1.1	7.5	0.50	0.62	0.50	47.5
5	T1	128	0.0	0.190	6.5	LOS A	1.1	7.5	0.50	0.62	0.50	50.8
6	R2	29	0.0	0.190	9.8	LOS A	1.1	7.5	0.50	0.62	0.50	46.3
Approach		182	0.0	0.190	7.0	LOS A	1.1	7.5	0.50	0.62	0.50	49.8
North: Mitchell Road												
7	L2	43	0.0	0.274	6.1	LOS A	1.6	11.5	0.49	0.62	0.49	47.4
8	T1	168	0.0	0.274	6.4	LOS A	1.6	11.5	0.49	0.62	0.49	34.9
9	R2	63	0.0	0.274	9.7	LOS A	1.6	11.5	0.49	0.62	0.49	43.2
Approach		275	0.0	0.274	7.1	LOS A	1.6	11.5	0.49	0.62	0.49	40.1
West: Winbourne Road												
10	L2	55	0.0	0.242	5.7	LOS A	1.4	10.0	0.42	0.58	0.42	42.6
11	T1	151	0.0	0.242	5.9	LOS A	1.4	10.0	0.42	0.58	0.42	51.2
12	R2	53	0.0	0.242	9.2	LOS A	1.4	10.0	0.42	0.58	0.42	41.2
Approach		258	0.0	0.242	6.6	LOS A	1.4	10.0	0.42	0.58	0.42	48.4
All Vehicles		911	0.0	0.274	6.8	LOS A	1.6	11.5	0.46	0.60	0.46	42.6

Table B3: Weekend Roundabout Intersection Performance of Mitchell Road with Winbourne Road for the Saturday Midday Peak Hour with Indoor recreational traffic

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
South: Harbord Road												
1	L2	89	0.0	0.662	23.4	LOS B	5.1	35.5	0.97	0.86	1.10	37.2
2	T1	422	0.0	0.662	17.8	LOS B	5.2	36.1	0.97	0.85	1.10	39.9
Approach		512	0.0	0.662	18.8	LOS B	5.2	36.1	0.97	0.85	1.10	39.5
North: Harbord Road												
8	T1	403	0.0	0.615	17.3	LOS B	4.7	32.7	0.96	0.82	1.03	40.4
9	R2	73	0.0	0.615	22.8	LOS B	4.6	32.2	0.96	0.82	1.03	44.5
Approach		476	0.0	0.615	18.1	LOS B	4.7	32.7	0.96	0.82	1.03	41.2
West: Winbourne Road												
10	L2	108	0.0	0.117	11.4	LOS A	1.1	8.0	0.56	0.70	0.56	49.2
12	R2	105	0.0	0.378	23.5	LOS B	2.0	14.1	0.94	0.76	0.94	34.4
Approach		214	0.0	0.378	17.3	LOS B	2.0	14.1	0.75	0.73	0.75	42.5
All Vehicles		1201	0.0	0.662	18.3	LOS B	5.2	36.1	0.93	0.82	1.01	40.8

Table B4: Weekend Signalised Intersection Performance of Harbord Road with Winbourne Road for the Saturday Midday Peak Hour with Indoor recreational traffic