



Hawkesbury City Council

attachment 5  
to  
item 30

Submissions and Petitions  
**Part B**

date of meeting: 28 February 2017  
location: council chambers  
time: 6:30 p.m.



①

23 12 2016

## Extra Photos

### Photos

A/ Ridges Lane that extends from Sydney Polo gates then to-wards the river to a gateway on the right.

Vehicles use this track, to get to wooden barn, being used in the paddock behind the gateway.

B/ Horse float and a coach passing along Ridges Lane.

Float has rear side wheels off bitumen to let bus pass. Both vehicles are near stopped, to pass, area at front of turf farm unsafe in spots.

C/ Cars at far right to south on Ridges Lane slowing to halt as only one car can use gate safely at one a time.

count the cars and imagine the hold up.  
~~SAT~~ with **2000 CARS** to maximum parking.



(2)

There is also what amount of impact, world cup traffic will have on Bells line of Road plus back streets Old Kurralong Road and Francis and Windsor streets, ON Saturdays and Sundays.

On both these days traffic is very heavy in both directions of Bells line of Road (Kurralong Road on maps)

D<sup>(1)</sup> This photo displays circa 300 cars parked inside Sydney Polo Grounds during a end of year Photo take oct 3 - Cono High.

A fair share of the 300+ are parked further to the left, and others are hidden by trees. 14 Dec 6 PM. Proceedings stopped with all and sundry heading for cars and forming a never ending bumper to bumper line heading to the ridges lane gateway.  
over



③

D<sub>1</sub> Being timed and counted from a perfect view, it took 17 minutes for 200 cars to leave the exit to Ridges Lane.

D<sub>2</sub> Shows a view of 11 cars spread out along the road in front of the turf farm.

The point raised is what impact did the 200+ cars make on Wednesday afternoon to peak hour traffic, during say 5:05 PM to 5:45 PM remembering there is no right-hand turn from Old K'jong Rd into Bello Lane.

If there was an impact triangle, the impact caused by the hypothetical World Cup numbers given - when arriving and leaving the polo venue.

Time will tell.



END OF RIDGES LANE  
TO SIBROOK GOODS GATE  
AT REAR.

*A*  
31/01/2005 00:01



B 7





DI





D2









Pipes under Ridges Lane.

Pipes under Road.

23 12 2016

Ridges Lane.

- (1) Situated near the southern end of turf farm and black fence post at driveway entrance.
- (2) Other end of pipe "across the road" has a 3metre drop to bottom of water - measured.
- (3) Demonstrates where a vehicle could end up if a "visitor" does not know the road.
- (4) arb. Situated on Ridges Lane not far from No 7 at the moment has a "for sale". It should not be hard to find.
- (5) a & b are directly across the road.

Please note there is no white line























5A







Ridges Lane.

Wet Conditions



State of Ridges Lane  
during rain and after.

23 12 2016

Photos:

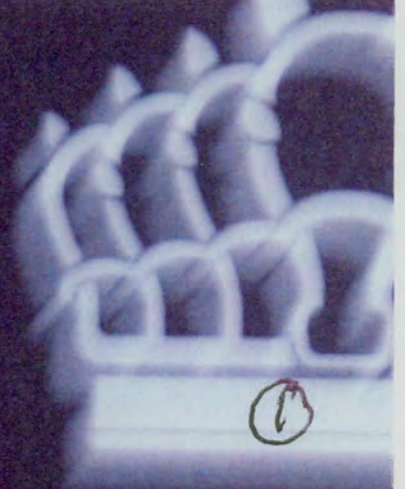
1+2 Inside Sydney Polo entrance  
3+4 - Ridges Lane facing north  
to Sydney Polo fields.

Taken adjacent to the South  
end of Muscats Turf farm

5(a) + 5(b) Water dish drain for run  
off to a pipe that runs under  
the roadway, then empties into  
a creek that leads to Sydney Polo  
wetlands

6. Water streaming down a diggins,  
(Basseave) driveway, next to  
boundary line of Muscats Turf farm.





SYDNEY PO  
XI WORLD CUP CH  
AUSTRALIA



2









④





TOP

(5a)

(5a)

road edge



(56)

WATER  
✓

✓  
WATER







Ridges Lane.

Traffic Problems.



Hi, These photos were taken to illustrate how dangerous Ridges Lane is at certain points, particularly with increased visitor traffic.

Please observe any oncoming traffic cannot pass a horse float with safety. The road is not wide enough  
Welcome to the "Gateway" for the  
"World Polo Cup."

Photos (1-104) Same truck at different distance

- (5) Semi trailer takes up all bitumen
- (6) Also this unit cannot be passed
- (7) Not much room left
- (8) Tight squeeze, if left wheels OK on dirt.







2





3





④



















8





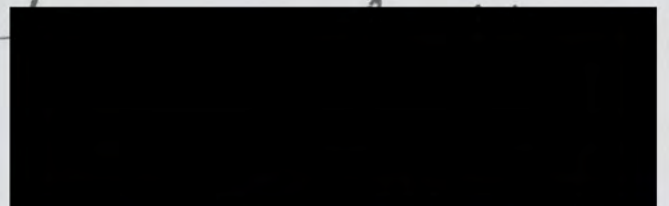
# Sydney Polo Club Planning Proposal

## Richmond Lowlands

### Transport Impact Assessment

LEP.006/15

Client // Basscave Pty Ltd  
Office // NSW  
Reference // 15S1501200  
Date // 15/04/16



Traffic Survey Page 1  
113



# Sydney Polo Club Planning Proposal

## Richmond Lowlands

### Transport Impact Assessment

Issue: B-Dr 15/04/16

Client: Basscave Pty Ltd

Reference: 15S1501200

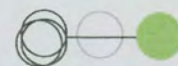
GTA Consultants Office: NSW

#### Quality Record

Issue	Date	Description	Prepared By	Checked By	Approved By	Signed
A	13/08/15	Final	Ashish Modessa	Wayne Johnson	Ken Hollyoak	Ken Hollyoak
B-Dr	15/04/16	Updated to Reflect Revised Scheme	Ashish Modessa	Rhys Hazell	Rhys Hazell	

© GTA Consultants (GTA Consultants (NSW) Pty Ltd) 2015

The information contained in this document is confidential and intended solely for the use of the client for the purpose for which it has been prepared and no representation is made or is to be implied as being made to any third party. Use or copying of this document in whole or in part without the written permission of GTA Consultants constitutes an infringement of copyright. The intellectual property contained in this document remains the property of GTA Consultants.



GTA consultants

Melbourne | Sydney | Brisbane  
Canberra | Adelaide | Perth  
Gold Coast | Townsville



# Table of Contents

<b>1. Introduction</b>	<b>1</b>
1.1 Background	1
1.2 Purpose of this Report	1
1.3 References	1
<b>2. Existing Conditions</b>	<b>2</b>
2.1 Road Network	2
2.2 North Richmond 'Redbank' Development	5
2.3 Traffic Volumes	6
2.4 Intersection Operation	8
2.5 Public Transport	10
2.6 Pedestrian and Cycle Infrastructure	12
2.7 The Gold Cup Event	12
<b>3. Planning Proposal</b>	<b>14</b>
<b>4. Traffic Impact Assessment</b>	<b>16</b>
4.1 Overview	16
4.2 Traffic Generation	16
4.3 Distribution and Assignment	18
4.4 Traffic Impact	18
<b>5. Conclusion</b>	<b>21</b>

## Appendices

A: ~~SEIRA INTERSECTION RESULTS~~

## Figures

Figure 2.1: Subject Site and Its Environs	2
Figure 2.2: Kurrajong Road/ Old Kurrajong Road intersection – No Right Turn Restrictions	3
Figure 2.3: Kurrajong Road/ Old Kurrajong Road Intersection Upgrade	4
Figure 2.4: North Richmond 'Redbank' Development	5
Figure 2.5: Proposed Secondary Route	6
Figure 2.6: Existing Friday PM Peak Hour Traffic Volumes	7
Figure 2.7: Existing Saturday AM / PM Peak Hour Traffic Volumes	8
Figure 2.8: Bus Network (Richmond to Bowen Mountain via Kurrajong or Grose Ward)	11
Figure 2.9: Bus Network (Richmond to Windsor via Wilberforce)	11

15S1501200 // 15/04/16

Transport Impact Assessment // Issue: B-Dr

Sydney Polo Club Planning Proposal, Richmond Lowlands



# 1. Introduction

1

## 1.1 Background

A Planning Proposal is to be lodged with Hawkesbury City Council for an amendment to the Hawkesbury Local Environmental Plan 2012.

The Planning Proposal is seeking to permit uses including polo facilities, function centres, eco-tourist facilities, industrial retail outlet and other uses associated with the polo industry on land currently classified as RU2 Rural Landscape. The land incorporates 23 allotments and is located in the vicinity of Kurrajong Road, Richmond Lowlands.

Basscave Pty Ltd engaged GTA Consultants to undertake a transport impact assessment of the existing and proposed land uses.

## 1.2 Purpose of this Report

This report sets out an assessment of the anticipated transport implications of the proposed development, including consideration of the following:

- i existing traffic conditions surrounding the subject site
- ii the traffic generating characteristics of the proposed development
- iii the transport impact of the development proposal on the surrounding road network.

## 1.3

## References

In preparing this report, reference has been made to the following:

- o Hawkesbury Development Control Plan (DCP) 2002
- o Hawkesbury Local Environmental Plan (LEP) 2012
- o Traffic surveys undertaken by Matrix Traffic and Transport Data as referenced in the context of this report (Friday 1 May 2015 between 2:00pm to 6:00pm, Saturday 18 July 2015 between 9:00am and 6:00pm and Sunday 18 October 2015 between 7:00am and 6:00pm)
- o Other documents and data as referenced in this report.



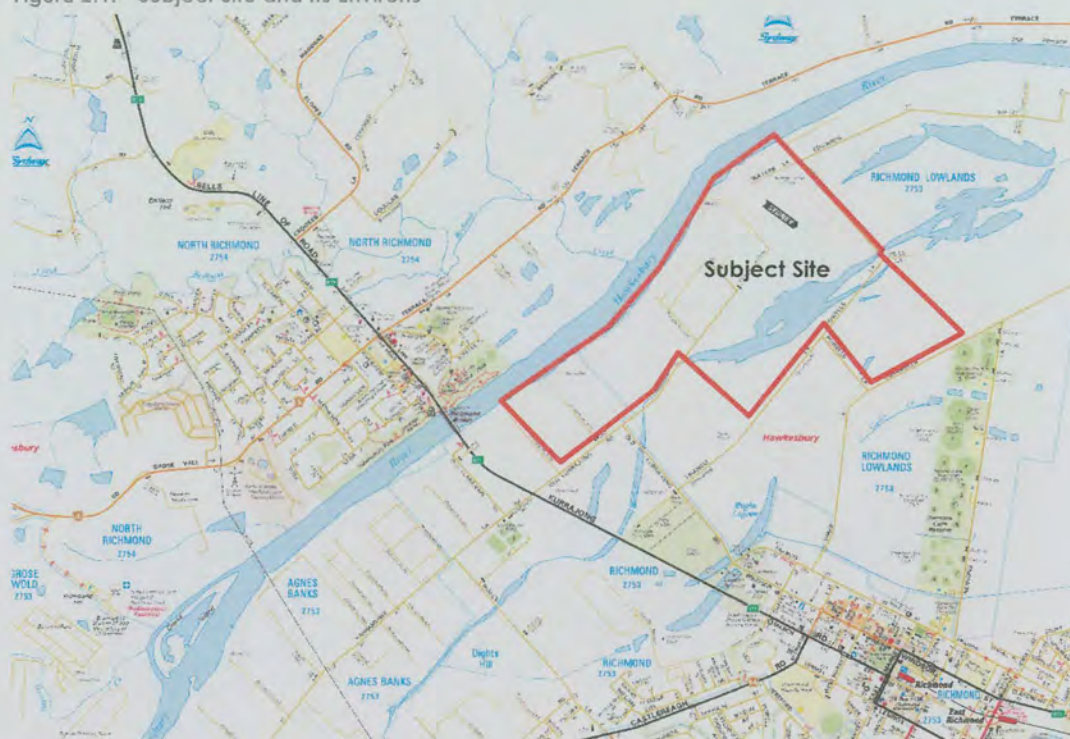
## 2. Existing Conditions

The subject site is located in Richmond Lowlands and is bound by the Hawkesbury River to the north, Powells Lane to the east, Cornwells Lane, Triangle Lane and Old Kurrajong Road/ Ridges Lane to the south and with private land to the west.

The site has a land use classification of RU2 Rural Landscape and is primarily used for agricultural purposes, polo playing and functions. There is also a tourist accommodation facility located in the south-western section of the site and a turf farm in the centre of the site. The surrounding land uses are primarily used for agricultural purposes.

The location of the subject site and its surrounding environs is shown in Figure 2.1.

Figure 2.1: Subject Site and Its Environs



Base source Sydway Publishing Pty Ltd

### 2.1 Road Network

#### Kurrajong Road

Kurrajong Road is classified as a State road (RMS No. 184) and in the vicinity of the site is aligned in a north-west-southeast direction. It is a two-way road configured with a 2-lane, 11 metre wide carriageway, set within an approximately 40 metre wide road reserve. Kurrajong Road carries approximately 29,000 vehicles per day<sup>1</sup>.

<sup>1</sup> Based on the peak hour traffic counts and assuming a peak-to-daily ratio of 8% for arterial roads.

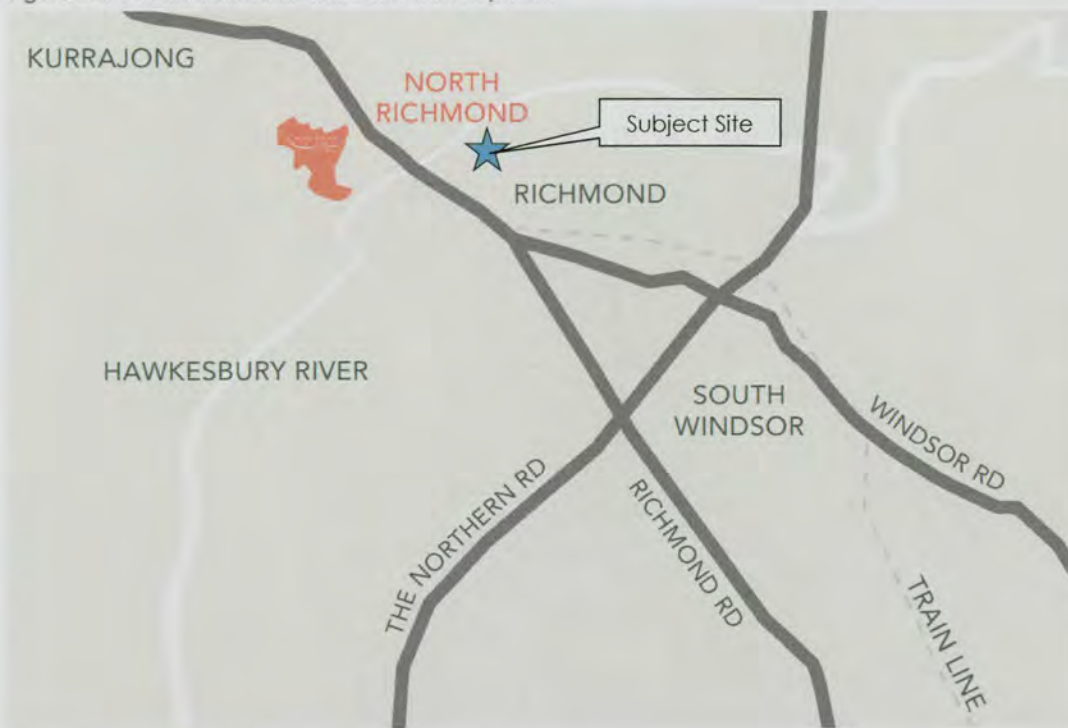


## 2.2

### North Richmond 'Redbank' Development

A residential development known as 'Redbank' has been approved on 147 hectares of land in North Richmond. The development site, shown in Figure 2.4, is to generate a yield of up to 1,400 residential dwellings that will be completed in 7 stages, with full development by 2021.

Figure 2.4: North Richmond 'Redbank' Development



Base source: [www.redbankrichmond.com.au](http://www.redbankrichmond.com.au) visited 06 August 2015.

The Redbank Transport Management and Accessibility Plan (TMAP) prepared by AECOM in March 2013, indicates that at full development, 1,130 vehicle trips would be generated from Redbank to the external road network. Approximately 60-65% of the vehicle trips were expected to travel south of Hawkesbury River via Kurrajong Road.

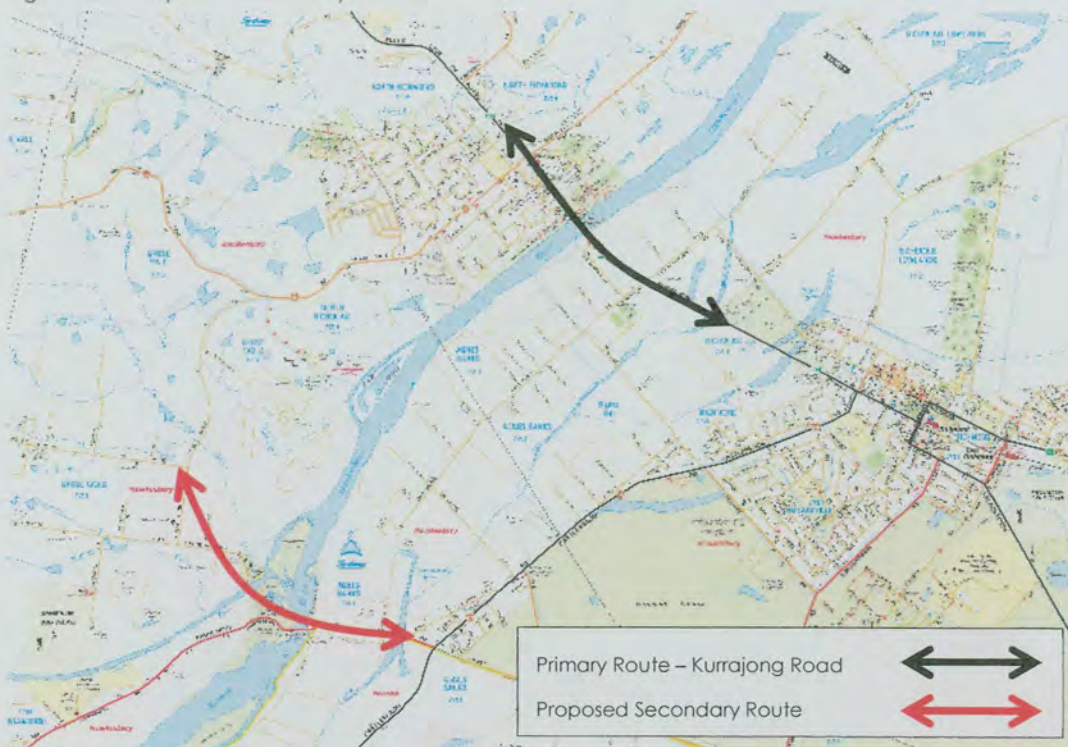
Traffic modelling undertaken for the study was completed for the intersection of Kurrajong Road and Old Kurrajong Road, with the improvements proposed as part of the Richmond Bridge and the approaches works. A review of the results indicates that at full development (2021), the intersection would significantly improve the delays experienced by the high volume movements at the intersection, and as such caters for the development traffic. However, the results show that the low volume movements (less than 20 vehicles per hour) would experience significant delays as a result of the increased traffic for the key movements. The Redbank TMAP study recommended that the intersection be considered for signalisation in 2021.

#### Proposed Secondary Route between Richmond and North Richmond

The Redbank TMAP traffic assessment considered the provision of the secondary route between Richmond and North Richmond. The secondary route through Yarramundi would be part of the long term solution to relieve congestion experienced along Kurrajong Road. The secondary route, indicatively shown in Figure 2.5, requires a new bridge across Grose River in order to provide a complete route.



Figure 2.5: Proposed Secondary Route



The Redbank TMAP concluded that with the secondary route, no additional intersection improvements are required to the intersection of Kurrajong Road and Old Kurrajong Road above what is proposed as part of the Richmond Bridge and the approaches upgrade works.

## 2.3 Traffic Volumes

Traffic movement surveys were undertaken on Friday 1 May 2015 between 2:00pm to 6:00pm and Saturday 18 July 2015 between 9:00am and 6:00pm. The surveys provide baseline traffic data in the area on typical days when the polo event and/ or functions would occur. The counts were undertaken at the Kurrajong Road/ Old Kurrajong Road intersection (Friday and Saturday) and the Old Kurrajong Road/ Ridges Lane intersection (Saturday only).

The construction works to upgrade the Kurrajong Road/ Old Kurrajong Road intersection occupied the western corner of the intersection at the time of the Saturday traffic surveys. As a result of the works, the right turn movement from Kurrajong Road into Yarramundi Lane was restricted, in addition to the two permanent right turn restrictions at the intersection. Heavy vehicles were also restricted from turning left from Yarramundi Lane into Kurrajong Road, due to the constrained construction works environment.

As shown in Table 2.1, the traffic volume along Yarramundi Lane during the Saturday survey was significantly lower compared to the volume during the Friday survey as a result of the turn ban. The volumes along Kurrajong Road and Old Kurrajong Road were generally consistent. Overall, the traffic volumes during the Saturday peak hour were within 10% of the traffic volumes during the Friday PM peak hour.



Table 2.4: Existing Operating Conditions - Old Kurrajong Road/ Ridges Lane

Peak	Average Delay (sec)	Level of Service (LOS)	Movement
Friday PM	6	A	Ridges Lane (L)
Saturday AM	6	A	Old Kurrajong Road South (R) Ridges Lane (L)
Saturday PM	6	A	Ridges Lane (L)

## 2.5 Public Transport

### 2.5.1 Train

The nearest train station is Richmond, located 3 kilometres to the south. Richmond is the terminus of the Richmond line that broadly makes up Sydney's greater western suburban network. All trains departing Richmond go through Sydney's CBD. Trains depart Richmond for Sydney CBD on a half-hourly basis.

### 2.5.2 Bus

Due to the semi-rural landscape and general reliance on private transport, the Richmond area, and in particular the intersection of Kurrajong Road and Old Kurrajong Road is served by limited bus services. The site is in close vicinity to three irregularly operating buses services summarised below.

A review of the public transport available in the vicinity of the site is summarised in Table 2.5.

Table 2.5: Public Transport Provision

Service	Route #	Route Description	Location of Stop	Frequency On/Off Peak
Bus	682	Richmond to Kurrajong	Corner of Kurrajong Road and Old Kurrajong Road	30 mins/3hrs
	680	Richmond to Bowen Mtn		30 mins/3hrs
	668	Richmond to Windsor		6 hrs
Train		Richmond to Sydney	March St	30 mins

The public transport service network in the vicinity of the site is shown in Figure 2.8.



Figure 2.8: Bus Network (Richmond to Bowen Mountain via Kurrajong or Grose Wold)



Source: Busways viewed 15 June 2015

([http://www.busways.com.au/sites/default/files/network\\_maps/RichmondBowenMountain\\_Map.pdf](http://www.busways.com.au/sites/default/files/network_maps/RichmondBowenMountain_Map.pdf))

Figure 2.9: Bus Network (Richmond to Windsor via Wilberforce)



Source: Busways viewed 15 June 2015 ([http://www.busways.com.au/sites/default/files/network\\_maps/RichmondSackville\\_map.pdf](http://www.busways.com.au/sites/default/files/network_maps/RichmondSackville_map.pdf))

15S1501200 // 15/04/16

Transport Impact Assessment // Issue: B-Dr  
Sydney Polo Club Planning Proposal, Richmond Lowlands



## 4. Traffic Impact Assessment



### 4.1 Overview

The key traffic generating uses on the site are expected to be the function centres and the annual polo event.

The other uses are expected to be low traffic generators, especially compared to a function or the annual polo event. These uses would operate outside both the site and the road network peak periods.

It is proposed that each function centre is permitted to hold up to 26 functions a year and therefore three functions are unlikely to occur simultaneously.

Therefore, for the purpose of this study, three scenarios have been assessed that include:

- Scenario 1 – Typical operation
- Scenario 2 – Two functions (e.g. weddings) occurring simultaneously
- Scenario 3 – An annual polo event.

The assessment undertaken in this section is based on existing (2015) traffic volumes only and does not consider traffic generated by the North Richmond 'Redbank' development, which is anticipated to be completed in 2021.

As discussed, the North Richmond 'Redbank' development study recommended that the intersection of Old Kurrajong Road and Kurrajong Road be signalised in 2021, should the secondary route between Richmond and North Richmond and through Yarramundi not be approved.

Once the intersection of Old Kurrajong Road and Kurrajong Road is signalised in 2021, the intersection would operate satisfactorily with development traffic from Redbank and this Planning Proposal.

### 4.2 Traffic Generation

#### 4.2.1 Scenario 1 – Typical Operation

As indicated, the function centres and the annual polo event are expected to be the key traffic generators on the site. On a typical day that does not include a function or polo event, the other uses are expected to generate less traffic, particularly during the road network peak periods.

The veterinary hospital, counselling services and microbrewery are expected to be the main traffic generators on a typical day. The full details of the size and operation of these uses are not known at this stage.

Notwithstanding, the following assumptions have been adopted in order to assess the anticipated traffic generation of the uses during the road network peak periods (weekday or weekend):

- 1 practitioner/ professional each at the veterinary hospital and counselling services
- 5 trips per hour for each practitioner/ professional (based on GTA empirical data)
- 10 trips per hour for the micro-brewery.

4

~~Using~~  
Same  
Surveys  
Function  
Centres  
Annual  
Polo Event



Based on the above assumptions, the combined traffic generation during typical operation would be in the order of **20 vehicle movements per hour** (or 10 vehicles). This equates to an additional vehicle movement every three minutes in the road network.

It is assumed these uses would be operational during the Friday PM, Saturday AM and PM peak periods. The directional split is assumed to be 60% inbound/ 40% outbound during the AM peak period and reversed during the respective PM peak periods.

#### 4.2.2 Scenario 2 – Two Functions

Roads and Maritime Service's Guide to Traffic Generating Developments 2002 does not provide a traffic generation rate for function centres.

As such, vehicle occupancy surveys were completed at the Sydney Polo Club during a wedding event on Friday 1 May 2015.

During the survey period, 128 people arrived via 59 private vehicles, which equates to an average vehicle occupancy of 2.2 people per vehicle.

A bus carrying 18 people also arrived in the hour leading up to the ceremony, indicating a travel model split of approximately 17% (i.e. 83% by private vehicle).

On the basis the venue has a maximum capacity for 200 seats, 166 people would arrive by private vehicle and 34 people by bus. Therefore, the anticipated arrivals to a function would be 76 private vehicle trips and 2 bus trips (assuming 17 people per bus).

The surveys also indicated that 75% of vehicles arrived in the hour leading up to the ceremony (i.e. the peak hour). Based on the anticipated traffic generation, 59 vehicles (including a bus) would arrive in the peak hour.

In the hour leading up to the ceremony, there was a split of 77% arrivals and 23% departures. As such, the total two-way traffic generation of a function in the event peak hour, would be **73 vehicle movements per hour** (59 arrivals/ 14 departures).

For two functions occurring simultaneously, the anticipated traffic generation during the peak hour would be in the order of 130 inbound vehicle trips per hour. Taking into account attendees being dropped off, there would be in the order of **146 vehicle movements per hour** (118 arrivals / 28 departures).

Two functions (e.g. weddings) could occur simultaneously on a Friday afternoon or a Saturday afternoon. Traffic volumes during the Saturday road network PM peak hour are 20% less than during the Friday road network PM peak hour, as illustrated in in Table 2.1. As such, only the Friday afternoon peak period has been assessed.

#### 4.2.3 Scenario 3 – Annual Polo Event

The traffic generation characteristics of an annual polo event have been based on the findings of the 2015 The Gold Cup event. To represent a 'worst case' scenario, the findings for the Sunday event day have been tested for a Saturday. As such, the traffic generation for the Saturday morning and afternoon peak periods are summarised below:

- Morning peak period – 274 vehicle movements per hour (80% inbound/ 20% outbound)
- Afternoon peak period – 353 vehicle movement per hour (8% inbound/ 92% outbound).



# Considered Obsolete

Table 2.1: Kurrajong Road/ Old Kurrajong Road Intersection – Approach Traffic Volumes

Peak Hour	Approach Traffic (one-way vehicles per hour)			
	Kurrajong Road	Yarramundi Lane	Old Kurrajong Road	Overall
Friday PM	1,883vph	434vph	23vph	2,340vph
Saturday AM	1,947vph	217vph	19vph	2,183vph
Saturday PM	1,658vph	208vph	19vph	1,885vph

It is understood that Yarramundi Lane is primarily used to link Richmond North and Lowlands with Penrith, via Castlereagh Road. The Redbank TMAP found that Yarramundi Lane, along with Inalls Lane and Castlereagh Road, are used as a 'rat-run' in the AM peak hour. Vehicles use this route to avoid congestion at the signalised intersection of Kurrajong Road and Bosworth Street, which is the key access point from the north into Richmond Town Centre.

The intersection also connects North Richmond and Richmond Lowlands with the Hills M2 and WestLink M7 motorways via the arterial roads, Richmond Road and Windsor Road.

The right turn movement into Yarramundi Lane on the Saturday was estimated based on the Friday surveys to understand the typical volume expected if construction works were not occurring. Likewise, the traffic volume at the Old Kurrajong Road/ Ridges Lane intersection, which was not surveyed in May, was estimated for the Friday PM peak hour based on the traffic data available.

As such, the estimated existing peak hour traffic volumes on the Friday PM peak and Saturday AM and PM peaks are summarised in Figure 2.6 and Figure 2.7.

Figure 2.6: Existing Friday PM Peak Hour Traffic Volumes

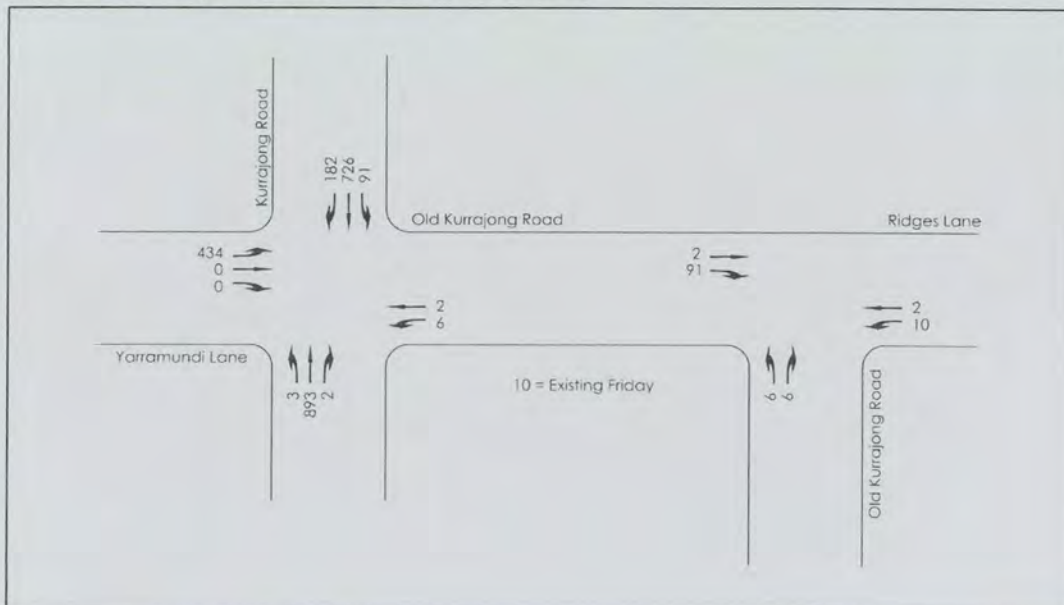




Table 2.2: SIDRA INTERSECTION Level of Service Criteria

Level of Service (LOS)	Average Delay per vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way & Stop Sign
A	Less than 14	Good operation	Good operation
B	15 to 28	Good with acceptable delays and spare capacity	Acceptable delays and spare capacity
C	29 to 42	Satisfactory	Satisfactory, but accident study required
D	43 to 56	Near capacity	Near capacity, accident study required
E	57 to 70	At capacity, at signals incidents will cause excessive delays	At capacity, requires other control mode
F	Greater than 70	Extra capacity required	Extreme delay, major treatment required

### Kurrajong Road/ Old Kurrajong Road Intersection

The surveyed traffic volumes were assessed on the upgraded Kurrajong Road/ Old Kurrajong Road intersection, which was completed in late 2015. A summary of the intersection operation is presented in Table 2.3, with full results presented in Appendix A of this report.

Table 2.3: Kurrajong Road/ Old Kurrajong Road Intersection – Upgraded Layout

Peak	Worst Movement < 15vph			Worst Movement > 15vph		
	Average Delay (sec)	Level of Service (LOS)	Movement/ Vehicles per hour (vph)	Average Delay (sec)	Level of Service (LOS)	Movement/ Vehicles per hour (vph)
Friday PM	51	D	Yarramundi Lane (T) – 1vph	15	B	Kurrajong Road North (R) – 192vph
Saturday AM	144	F	Old Kurrajong Road (R) – 8vph	11	A	Kurrajong Road North (R) – 279vph
Saturday PM	32	C	Yarramundi Lane (T) – 2vph	12	A	Kurrajong Road North (R) – 185vph

Table 2.3 shows that it is typically the movements with less than 15 vehicles per hour that experience the majority of delays during the respective peak periods. These movements are also mostly approaching from Old Kurrajong Road and Yarramundi Lane and turning right or crossing Kurrajong Road. For example, vehicles turning right from Old Kurrajong Road during the Saturday AM peak hour will have a lengthy delay in excess of two minutes and a LOS F.

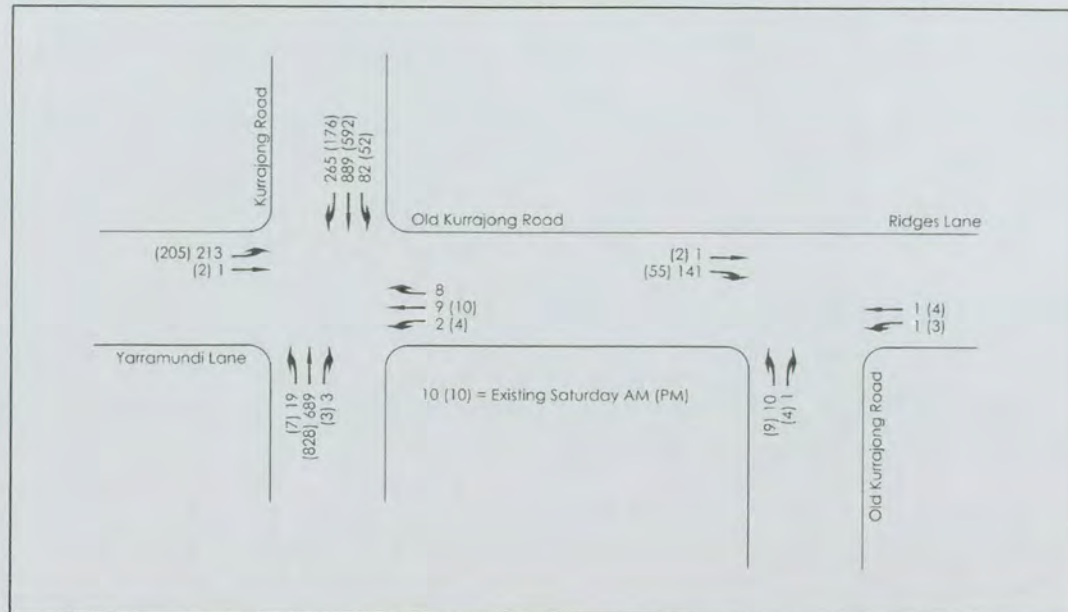
When considering the major movements, the delays generally less than 15 seconds and acceptable.

### Old Kurrajong Road/ Ridges Lane Intersection

The Old Kurrajong Road/ Ridges Lane intersection currently operates satisfactorily with minor delays experienced. The existing operation is summarised in Table 2.4, with full results presented in Appendix A of this report.



Figure 2.7: Existing Saturday AM / PM Peak Hour Traffic Volumes



The estimated existing peak hour traffic volumes illustrate that Old Kurrajong Road and Ridges Lane currently carry low traffic volumes thus having sufficient capacity to accommodate additional traffic, noting that a typical single traffic lane is generally able to carry up to 900 vehicles per hour.

## 2.4 Intersection Operation

The operation of the study intersections have been assessed using SIDRA INTERSECTION<sup>5</sup>, a computer based modelling package which calculates intersection performance.

The commonly used measure of intersection performance, as defined by the RMS, is vehicle delay. SIDRA INTERSECTION determines the average delay that vehicles encounter and provides a measure of the level of service.

Table 2.2 shows the criteria that SIDRA INTERSECTION adopts in assessing the level of service.

<sup>5</sup> Program used under license from Akcelik & Associates Pty Ltd.