Appendix F

Transport Impact Assessment by Arup

EG Property Group

Tahmoor Tourist & Recreation Precinct

Transport Impact Assessment

Rev A | November 2010

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Appendices

1 Introduction

Arup has been commissioned by the applicant to undertake a transport impact assessment for a proposed rezoning of an existing rural parcel of land at Tahmoor in the Southern Highlands of NSW. The purpose of this report is to provide a detailed traffic and transport assessment to Wollondilly Shire Council so it can determine the traffic impacts on the local road network should the land be developed for a future rural residential subdivision of up to 92 lots as well as a recreational precinct that would easily accommodate up to 190 people.

The report describes the existing site access, traffic situation, existing road network performance and transport facilities in the vicinity of the site. It also analyses the proposed development's effect on forecast traffic generation and trip distribution. A transport impact assessment is then undertaken for the likely future additional peak weekday and weekend traffic which will be generated by this type of redevelopment of the site.

The transport impact assessment for the site has generally determined that the future site redevelopment will have minimal effect on the existing local roads in the area, with the exception of River Road, between the site and the existing Tahmoor urban area, which will require widening to a minimum two lane RTA Rural Road width standard.

1.1 The Demography of Tahmoor

The town of Tahmoor is located about 100km south – west of Sydney. The main regional town in the area is Picton which is located about 6km north of Tahmoor on the Old Hume Highway (now Remembrance Drive). Other similar townships, Bargo and Thirlmere are located about 8km south and 3km west of Tahmoor. As per the 2006 ABS census data, the total population of Tahmoor is just under 4000 persons with a median age of 34 years.

About 60% of the workforce in Tahmoor is engaged in trade, labour, driving, machinery operation or clerical jobs and about 13% are professionals. The most common professions are school education, road freight transport etc. The median weekly income is $1,077, compared to $1,171 in Australia. About 6.7% of the labour force in Tahmoor was unemployed in 2006, which was slightly higher than the national average of 5.2% at that time.

About 95% of the dwellings in the town are separate houses. During the site inspection, most of the dwellings were observed to have multi unit garages (refer to Photograph 1). This is indicative of high car ownership and usage in the area.

Photograph 1: A Typical Dual Garage House in Tahmoor

1.2 Scope of the Report

The scope of this report is primarily to assess the following matters:

- Assessment of existing traffic and transport arrangements
- Assessment of the local road condition leading to the site (e.g. River Road)
- The likely traffic and parking impact of the proposal in the locality
- Assessment of the suitability of the proposal
- The impact on road network traffic safety and efficiency
- The impact on pedestrian movement, safety and amenity

2 Existing Conditions

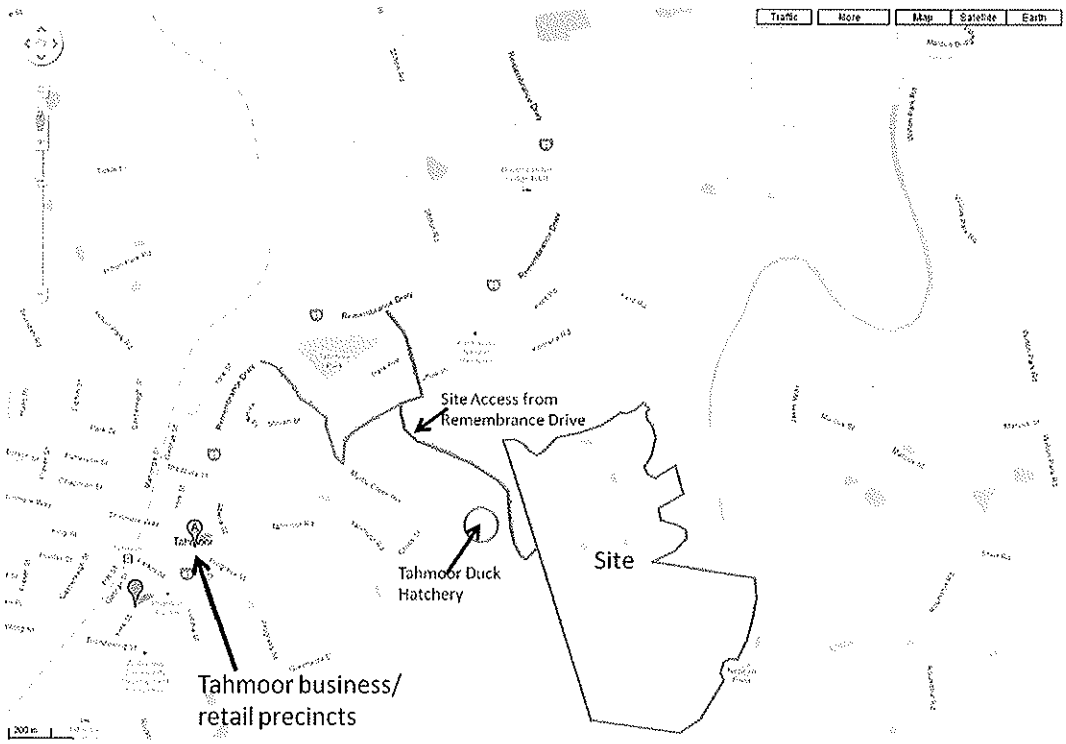
2.1 Site Area and Land Uses

The site currently accommodates numerous grazing paddocks and is located on the south eastern end of River Road about 1.7km from the Remembrance Drive intersection (refer to Figure 1).

The site is generally bounded by conservation areas adjacent to the Nepean River to the east and Myrtle Creek to the north with existing farms (Tahmoor Duck Hatchery) and rural residential properties to the west and south (Rural Small Holdings as per Wollondilly Local Environmental Plan 2009).

The existing vehicular site access is provided via River Road. A steep hilly section of this road rises about 40 – 50m higher than the site to the west. There is a relatively steep downward slope towards the site from the existing end of River Road (refer to Photograph 3).

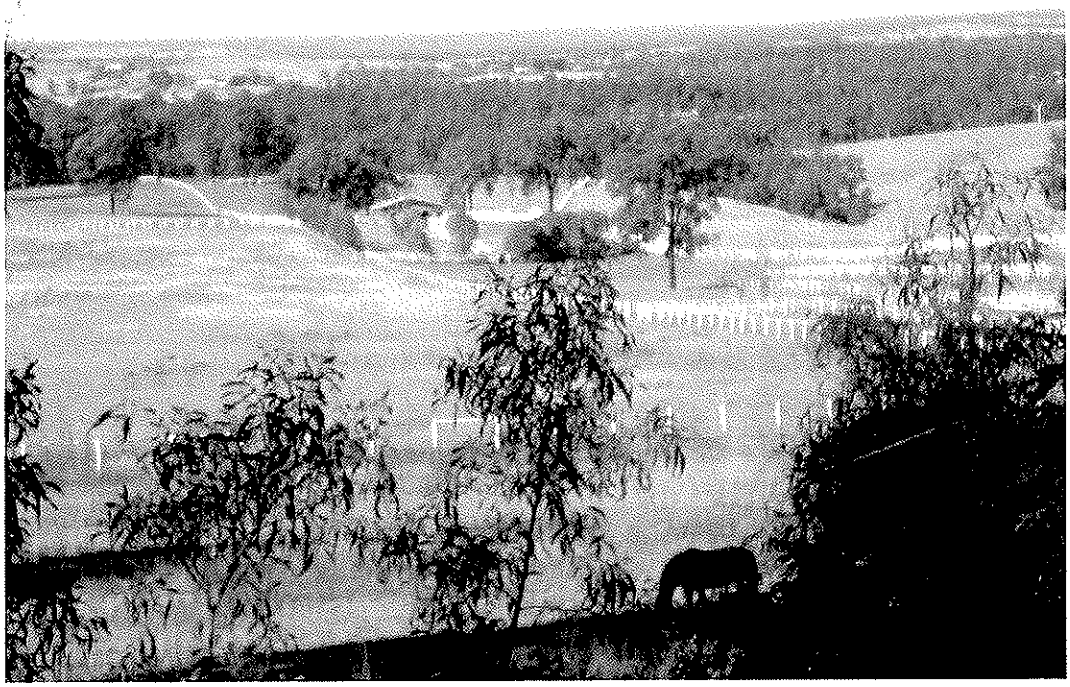
Figure 1: Site Location



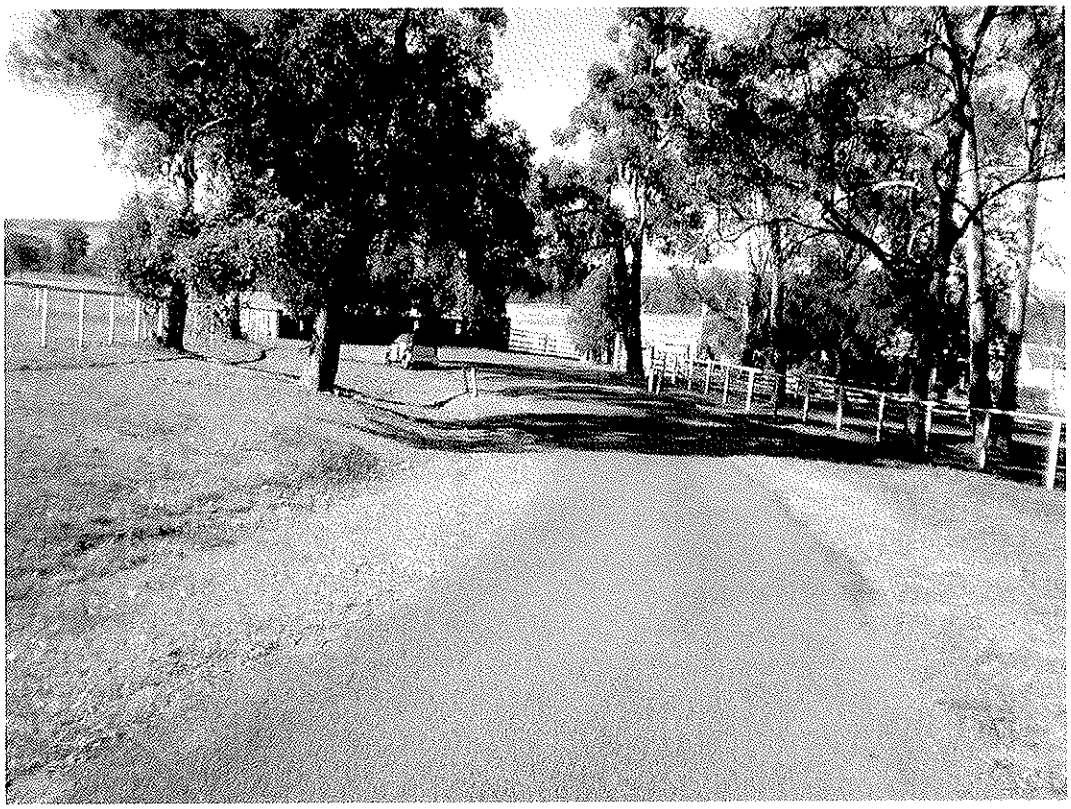
The locality land uses in Tahmoor includes mostly single storey residential houses along both sides of River Road. Specific land uses include:

- Tahmoor Town Centre – western side of Remembrance Drive (about 3km west of the site);
- Tahmoor Park – bounded by Remembrance Drive – Myrtle Creek Avenue – Park Avenue – River Road (about 2km north – west of the site);
- Wollondilly Anglican College, Remembrance Drive (about 7km south – west of the site);
- Tahmoor Duck Hatchery, River Road (about 500m north – west of the site).

Photograph 2: Existing Site (View from River Road)



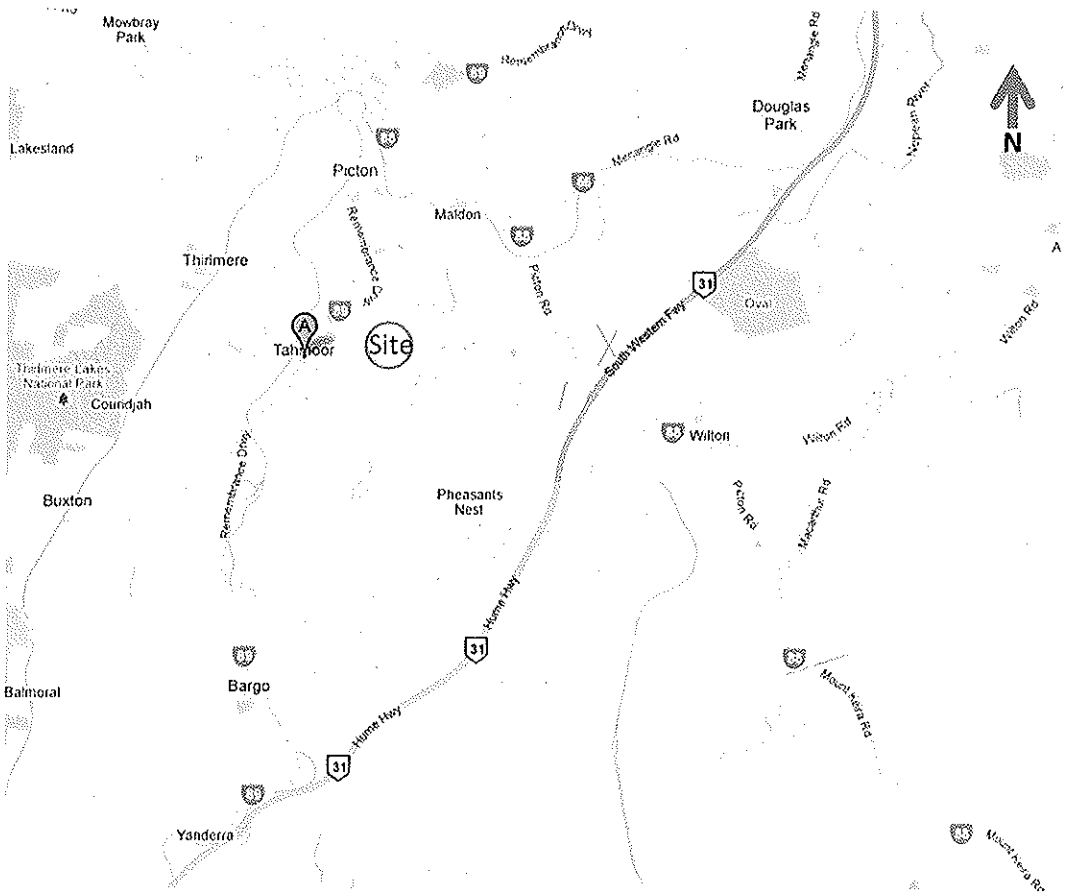
Photograph 3: Existing Site Entrance Approach from River Road



2.2 Road Hierarchy and Traffic Data

The Hume Highway (Motorway) is the main arterial road in the vicinity of the site. The Hume Highway is one of the longest highways in Australia which provides the most direct connection between Sydney and Melbourne (873km). It is generally a divided carriageway and has 2 lanes in each direction in the vicinity of Picton Road.

Figure 2: Regional Road Network Map



Remembrance Drive (Old Hume Highway) provides a direct north – south connection between Camden and the Hume Highway south of Bargo, via Picton and Tahmoor. It is generally a two lane two way road under the jurisdiction of the RTA. The general speed limit of Remembrance Drive is 80km/h, however the speed limit is reduced to 50km/h near most urban areas (refer to Photograph 4).

Photograph 4: Remembrance Drive at River Road Intersection (looking west)

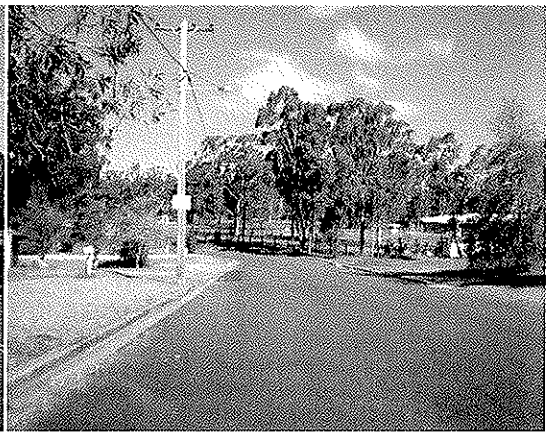
Picton Road, a sub – arterial road, provides access to Picton Town Centre and areas such as Tahmoor and Thirlmere from The Hume Highway via Menangle Street, Prince Street and Argyle Street. The Picton Road route would generally be the preferred route for most future traffic from this site when travelling to and from the north. Picton Road is generally a two lane two way rural road with various posted speed limits up to 100km/h.

Thirlmere Way is another sub – arterial road which provides an east – west connection between the eastern and western part of Tahmoor by means of a railway overbridge. It generally provides access to the residential properties of Tahmoor which are located on the western side of the railway line. This road may be used by some future site subdivision traffic when travelling to and from rural areas in the west of Wollondilly Shire.

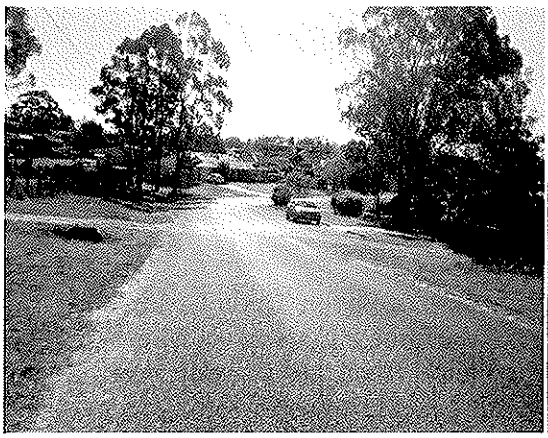
River Road, Moorland Avenue and Myrtle Creek Avenue are local roads which provide access to residential properties on the east side of Remembrance Drive. The posted speed limit of River Road is 50km/h. An existing load limit restriction (8 tonnes or over) is in place in River Road from the Remembrance Drive intersection (refer to Photograph 5).

Photograph 5: Various sections of River Road

Just South of Remembrance Dr



Just South of Moorland Rd



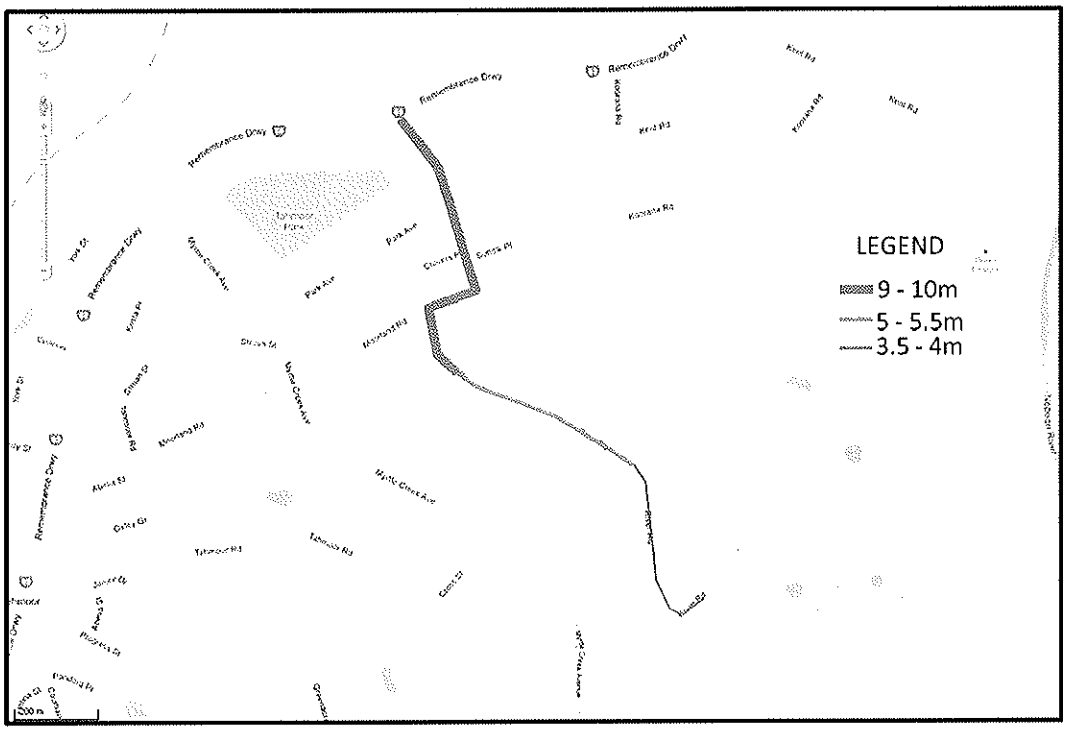
About 150m south of Moorland Rd

About 370m south of the Moorland Rd

River Road is generally an undivided two lane – two way road between Remembrance Drive and Moorland Road. The road width is gradually reduced to south of Moorland Road. Near the existing site access, River Road is generally only about 4m wide. The road width of the various sections of River Road is illustrated in Figure 3.

Sight distance is also very limited in some curved sections in the hilly parts of River Road (i.e. between the site and Tahmoor Duck Hatchery – refer to Photograph 6).

Figure 3: Existing Road Width on Various Sections of River Road

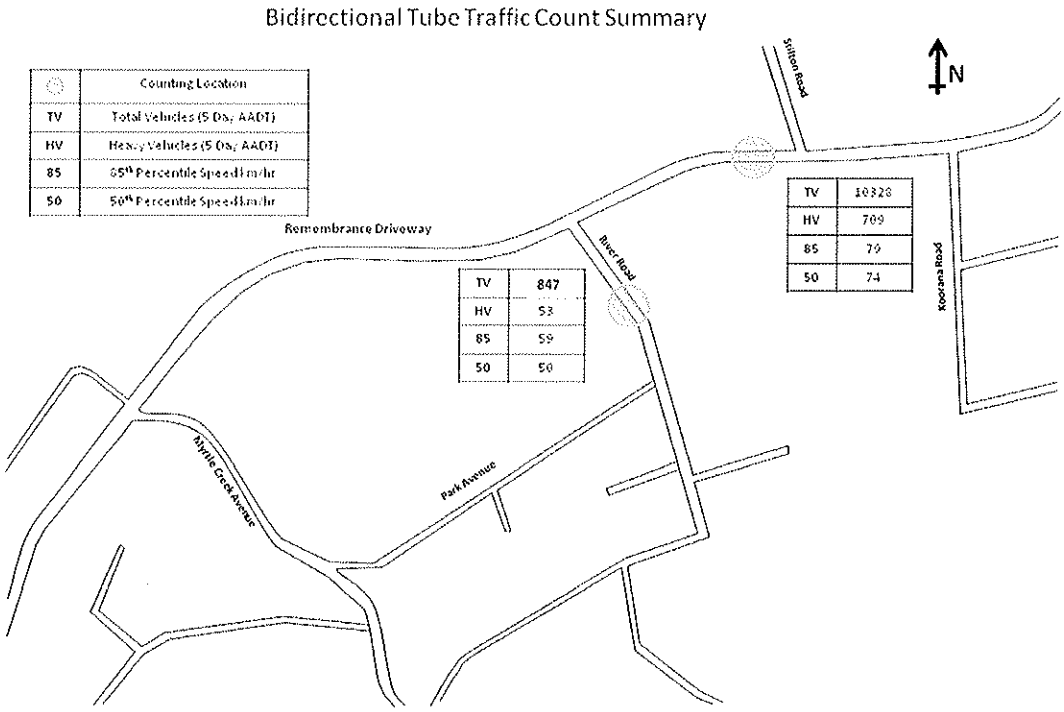


Photograph 6: Limited Sight Distance Looking North on River Road

2.3 Traffic Data

A seven day traffic count has been undertaken by an Arup appointed private contractor 'CFEIT' on Remembrance Drive and River Road. The counts were undertaken between 23 August 2010 and 29 August 2010 (non – school holiday period). The detailed traffic count data is attached in **Appendix A** and the summary results are presented in Figure 4.

Figure 4: Traffic Count Data



Traffic data on the above figure shows that considering it is an arterial road, the traffic volume on Remembrance Drive is well within acceptable limits. The current daily traffic volume is also acceptable on River Road as per the RTA's maximum environmental capacity threshold of 300 vehicles per hour – 3,000 vehicles per day typically - for a local residential street.

2.4 Intersections at the Vicinity of the Site

As indicated by the site locality plan in Figure 1, the three key intersections on the traffic approach routes to the site which will carry the majority of the future site traffic are as follows:

- Remembrance Drive/ River Road
- Remembrance Drive/ Myrtle Creek Avenue
- River Road/ Moorland Road

The above three intersections were surveyed by an Arup appointed private contractor 'Roar Data' on Thursday, 26 August 2010 between the following peak traffic hours:

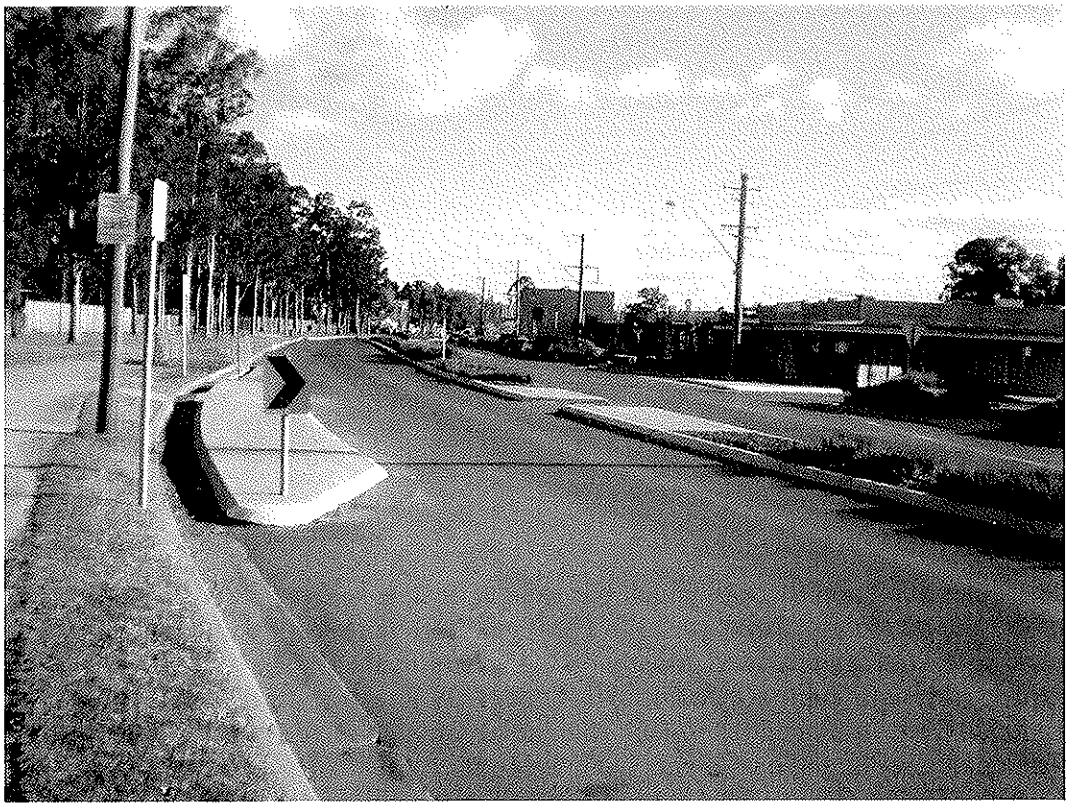
- 7am – 9am
- 4pm – 6pm

The actual morning and afternoon peak hour traffic periods which were determined from these intersection traffic surveys were 08.00 – 09.00 hrs and 16.45 – 17.45hrs respectively. The complete intersection count data is attached in **Appendix A**. Further analysis and discussion of the current and future levels of service for traffic at these intersections, e.g. with and without the site development traffic, is presented later in Section 4.4 of this report.

2.5 Pedestrian Facilities

Paved footpaths are provided on Remembrance Drive in front of the retail precinct. A number of refuge islands are provided in front of the retail shops in order to allow pedestrians to cross Remembrance Drive.

Photograph 7: Refuge Island on Remembrance Drive



No paved footpaths are provided along River Road. No pedestrians were observed walking along River Road during the site inspection.

2.6 Parking Provision

The parking is generally unrestricted on residential streets in Tahmoor. However, in front of the main retail precinct on Remembrance Drive, parking is restricted to two hours (2P 8.30am – 5pm Monday – Friday and 8.30am – 12.30pm Saturday). An off – street car park is also provided in the Tahmoor Town centre. The parking inside the car park is restricted to three hours between 8am – 6pm Monday – Friday and 8am – 4pm Saturday – Sunday.

During a site inspection on Wednesday, 25 August 2010 between 3pm – 4pm most of the on and off – street parking spaces were occupied near Tahmoor Town Centre.

Photograph 8: Parking on Remembrance Drive in front of the Retail/ Business Precinct

2.7 Public Transport Facilities

2.7.1 Train

The Tahmoor Train Station, which has two platforms, is located about 3.2km west of the site on George Street (refer to Photograph 9). A few rail commuter car parking spaces are provided, mostly on the western side of the station on Pitt Street. Although Tahmoor station falls under City Rail's Southern Highlands Line, no direct train connection is provided between the Sydney CBD and Tahmoor. City bound passengers from Tahmoor must change trains at Campbelltown station. The train journey to Campbelltown takes 36 minutes from Tahmoor. Travel to the Sydney CBD by train takes a minimum of about 1.5 hours.

There was no train timetable information visible at Tahmoor Station. According to the 131500 website, there is generally about one train each hour in each direction, over the major part of the day on weekdays.

Photograph 9: Tahmoor Station

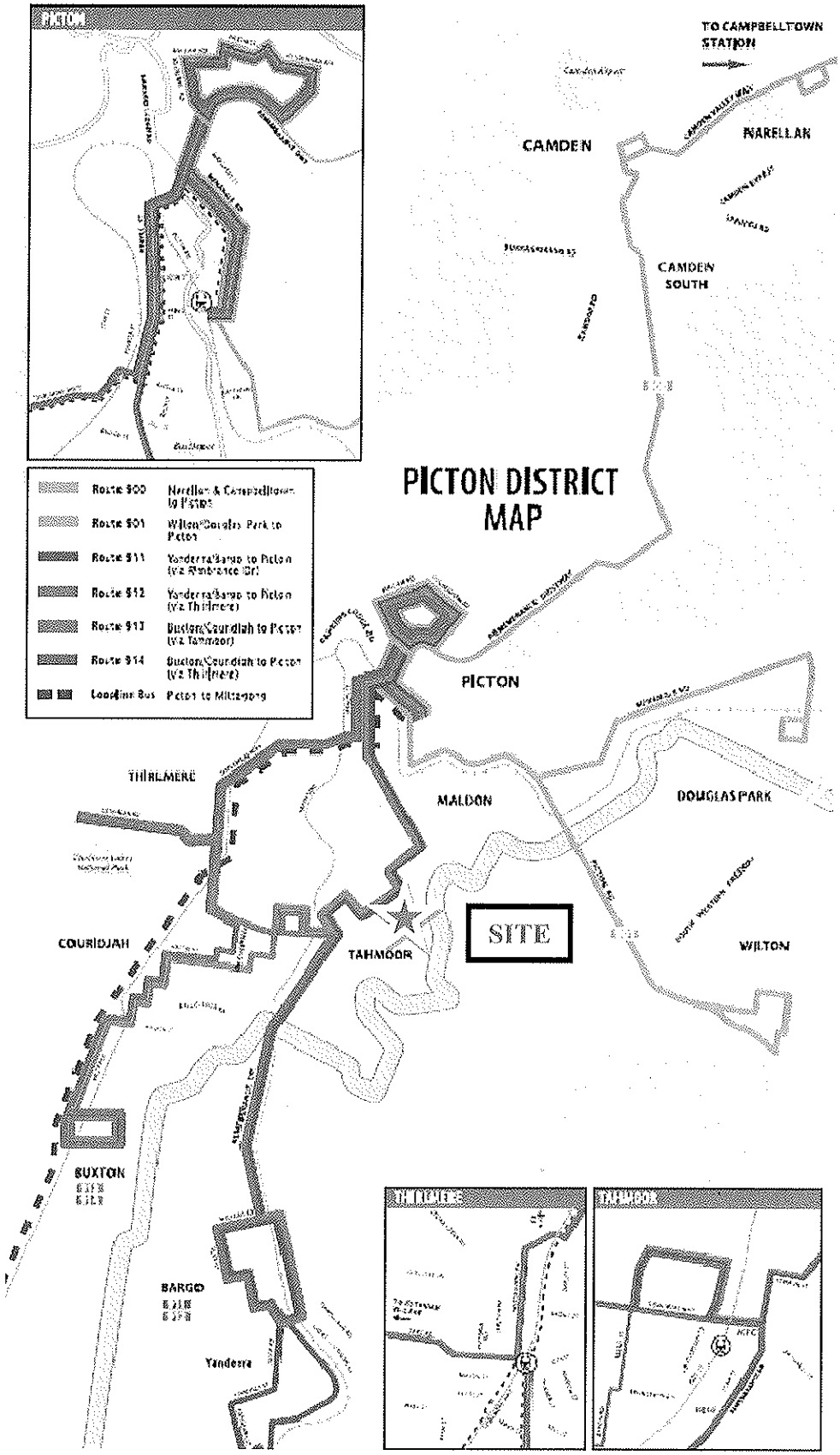
2.7.2 Bus

Picton Buslines operate bus routes between Bargo/ Buxton and Picton via Tahmoor. Routes 911, 912, 913 and 914 operate via Tahmoor. Bus frequencies vary during the day but generally one bus service is available each hour during the day time on weekdays and lesser frequency during the weekend. The Picton Buslines route map is provided in Figure 5. The closest bus stop to the site is located on Remembrance Drive just west of River Road (refer to Photograph 4).

Picton Buslines also provides school bus services in the area. All school children who live within an eligible radius/ walking distance travel for free.

A Wollondilly Community Bus is also available for use by community groups within the Shire. The bus is provided to assist transport to the disadvantaged in the community. The maximum seating capacity is 22 passengers. The booking fee is $22.00 within the shire and $44.00 outside the shire area.

Figure 5: Picton Buslines Route Map



Source: Picton Buslines

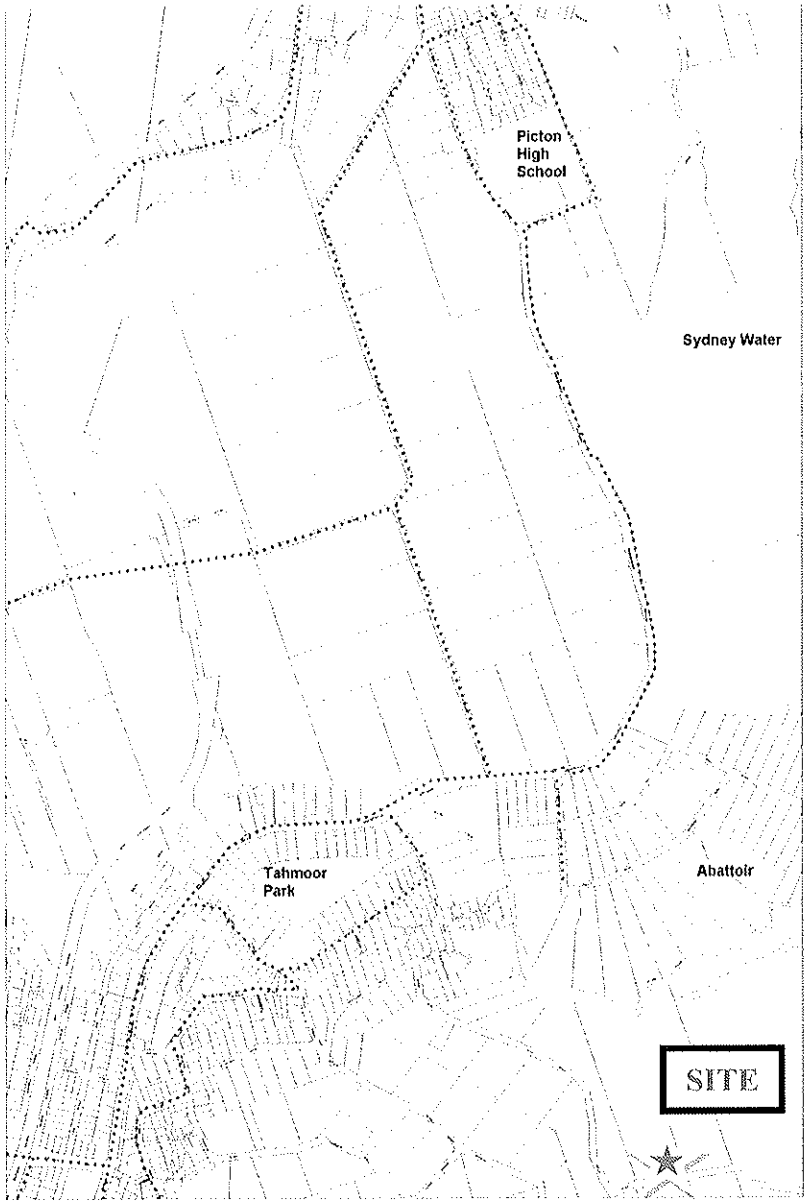
2.7.3 Taxi

A wheelchair accessible taxi service is provided by 'Tahmoor and District Taxis' in the area.

2.8 Bicycle Route and Facilities

A separate bicycle lane is generally provided on the eastern side of Remembrance Drive through Tahmoor (refer to Photograph 4). Other designated bicycle routes in the area, generally without actual cycle lanes, are shown in Figure 6.

Figure 6: Bicycle Route Map for the Picton to Tahmoor Area



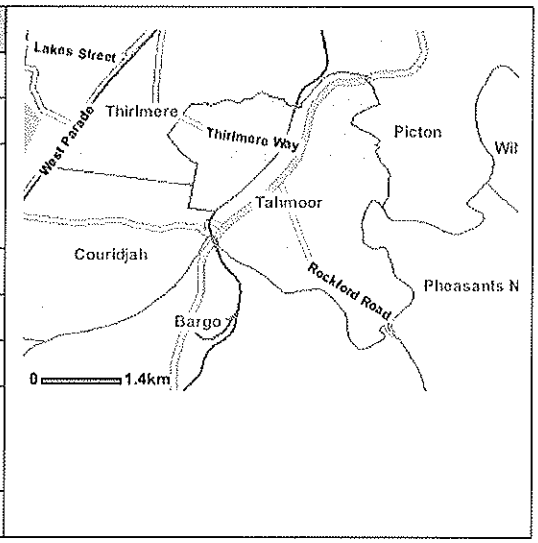
Source: Wollondilly Shire Council

2.9 Travel Mode Share and Distribution

As per the NSW Bureau of Transport Statistics (BTS) data, Tahmoor falls under zone 1448. Table 1 below provides a breakdown of proportions of journey to work travel mode for Tahmoor residents.

Table 1: Travel Modes from 2006 Census for Tahmoor Residents Journey to Work

Travel Mode	Total Travel	% Mode
Train	97	5%
Bus	9	0.5%
Car as Diver (incl bus & motorbike)	1221	67.5%
Car as passenger	107	6%
Other modes	69	4%
Not stated	36	2%
Work at home or did not got to work	268	15%
	1807	100%



High car dependency (over 70%) for the journey to work by Tahmoor residents is evident from the above table, even higher if those who did not travel at all on the survey day are not considered.

2.10 Major Road Works by Wollondilly Shire Council

The Remembrance Drive and Thirlmere Way roundabout is currently being updated by Wollondilly Shire Council. The Council has been funded by the Mine Subsidence Board to carry out works along Remembrance Drive from Bradbury Street to Progress Street and along Thirlmere Way between Remembrance Drive and York Street. The project includes:

- Replacement of sections of kerb and gutter
- Replacement of the Remembrance Drive /Thirlmere Way roundabout island
- Replacement of pavement for sections around the Remembrance Drive/Thirlmere Way roundabout

In addition to above, Council has received an application to close York Street (between Thirlmere Way and Larkin Street) to facilitate further commercial development within the Tahmoor shopping precinct.

Although the road closure proposal is likely to have minimal traffic impact in the Tahmoor Town Centre in the shorter term, the road closure could have greater potential impact considering the future growth of the shire. Public consultation is currently being undertaken for the proposal.

3 The Proposed Development

A future rural residential subdivision at the site could potentially accommodate up to 92 large rural residential lots as well as areas specifically designed for recreational use by both residents and visitors alike. The current proposed site plan, including the Tahmoor Tourist and Recreation Precinct, is illustrated by Figure 7 below.

The recreational areas include a new, state of the art conference facility that can accommodate approximately 100 guests for functions such as weddings and christenings. During busy times, the site recreation areas/ conference facility could potentially generate vehicular traffic movements from up to 190 additional visitors to the site in addition to the traffic movements from the 92 residential lots.

Figure 7 : Current Proposed Site Plan

3.1 Access Routes and Intersections

The proposed residential streets are a combination of local collector roads and local access streets which are essential in order to provide vehicular access to the rural residential precinct and public domain areas. They not only carry traffic but help to define the overall environmental amenity and character of a precinct.

A well designed local road network will ensure many of the problems associated with road traffic are reduced to a manageable level or are eliminated. A clearly defined road hierarchy helps to ensure that the potential local traffic impacts are limited to those streets which have the designated function of carrying through traffic.

To reinforce the rural residential nature of future local access streets, their carriageways should be:

- a suitable width for their function
- short in length
- have low design traffic speeds
- provide the sense of a safe low speed pedestrian environment
- pedestrians should be able to easily cross these streets
- cyclists should be able to share the road pavement with vehicles

The internal road network as shown in Figure 7 in the Tahmoor Tourist and Recreation Precinct will meet all these design objectives. The local collector road system designed for the precinct should also be capable of functioning as a school bus route. All works should be designed to comply with the relevant Wollondilly Shire Council standards for engineering works.

The future site traffic generation impact has been assessed for both the normal weekday and peak weekend traffic scenarios, which are defined as follows.

- The future peak weekday traffic situation is defined as the future site residential traffic (approximately 920 vehicle movements per day , 92 in either the morning or afternoon peak hours), travelling between the site and identified Remembrance Drive intersections. These are generally the River Road intersection for traffic travelling to or from the north or east and the Myrtle Creek Avenue intersection for traffic travelling to or from the west or south.
- The future peak weekend traffic situation is defined in relation to the currently identified Saturday morning and Sunday afternoon peak hour traffic periods, determined from the tube count surveys, which are 10.00 – 11.00 hrs and 17.00 – 18.00 hrs respectively. At these times the future site residential traffic would still be generally similar to the peak weekday traffic situation, but the additional likely visitor traffic (generally arriving on the Saturday) and generally departing on the Sunday) would also need to be considered.

4 Transport Impact Assessment

4.1 Traffic Generation

The 2006 household census data for travel to work for the Tahmoor area shows a high dependency on private vehicle usage (refer to Table 1).This high dependence on car travel is unlikely to change significantly in the short to medium term for existing or future residents/ visitors to Tahmoor.

For a conservative approach, it has also been assumed that there is effectively no traffic generation from the site currently. Therefore, no deduction has been made from the forecast future traffic generation of the site.

For the forecast traffic generation of the rural residential component of the future site development, traffic generation rates of 10 vehicle trips per day per household or 1 vehicle trip per hour per household in both the morning and afternoon peak hours would be applicable for each rural residential lot. These rates are slightly higher than standard RTA suburban detached dwelling traffic generation rates.

These external traffic generation rates would result in a future total of up to 92 vehicle trips per hour (in both the am and pm peak hours) or 920 future vehicle trips per day from the proposed residential development. Assuming, no weekday traffic generation by the equestrian facility, the site traffic generation trips for a typical weekday are likely to be:

- AM peak hour = **92 vehicles** (18 incoming and 74 outgoing, considering a 20%/80% split)
- PM peak hour = **92 vehicles** (64 incoming and 28 outgoing, considering a 70%/30% split)

For the proposed recreational component of the development with a maximum capacity of 190 visitors on-site, persons would usually share transport with typical car occupancy of 2 - 3 persons per vehicle when travelling to or from the site. The estimated trip generation rate is based on an average of 2.5 persons per vehicle travelling to the recreational facilities, which equates to an additional 76 vehicles arriving and/or departing per day for the facility at full capacity.

The on – site recreational facilities (e.g. lookout, bike/ horse trial, tennis court, conference centre) will attract visitors to stay overnight as the development will also provide overnight accommodation and camping facilities. Therefore, it is likely that the peak inbound and outbound vehicle trips would normally be distributed over two days on a busy weekend.

As such, the traffic calculation is undertaken over two days assuming 90% incoming recreational traffic on a Saturday Morning and 90% outgoing recreational traffic on a Sunday Afternoon. Assuming a peak hourly rate of 50% of all daily recreational traffic arriving or departing in the peak hour, the peak hourly weekend traffic pattern for the recreational visitors would be likely to be:

- Saturday morning peak hour – **38 incoming vehicles**
- Sunday afternoon peak hour – **38 outgoing vehicles**

It is also assumed that the future weekend peak site residential traffic during the weekend peak hours will be equally as high as the normal weekday am and pm peak hour traffic periods. This may be a slight over estimation of residential traffic generation but considering the high car dependency in the region, this estimation is probably appropriate. Therefore, the total estimated future site vehicle traffic during the peak hours on a busy weekend is likely to be:

- Saturday morning peak hour = **130 vehicles** (56 incoming and 74 outgoing traffic, considering a 20%/80% split of residential traffic)
- Sunday afternoon peak hour = **130 vehicles** (55 incoming and 75 outgoing traffic, considering a 60%/40% split of residential traffic)

This future additional traffic has been added to the existing road network traffic in the traffic analysis which has been undertaken in this report.

4.2 Traffic Distribution

The 2006 ABS census data shows the following journey to work trip distribution for Tahmoor residents:

- 46.1% trips to destinations within Wollondilly LGA
- 48.9% trips to destinations located north of Wollondilly LGA
- 5% trips to the destinations located south of Wollondilly LGA

For the future weekday peak hour trip distributions, it is assumed that approximately 70% of the vehicular trips will be to/ from the north and east (suburbs to the north including Picton) and the remaining 30% to the south and west (suburbs to the south including the local Tahmoor retail/ business precinct).

The weekend peak trip distributions for both the future site residents and recreational visitors are likely to be more evenly distributed north and south as it is expected that more residents will be visiting the Tahmoor Town Centre located to the south of the site and a significant number of recreational visitors will come from the rural areas which are generally located to the south and west of Tahmoor. Therefore, a 50% / 50% split (to the north and south) of the future weekend peak hour vehicle trip distribution for both the site residential and recreational traffic is considered appropriate.

4.3 External Road Network Impact

The effect of the future site generated traffic in terms of the predicted peak hour traffic increases on the two most affected roads is summarised in Table 2.

The data in Table 2 shows that existing hourly traffic flows on the local roads (e.g. River Road and Myrtle Creek Road) are very low, being less than 100 vehicles per hour typically. Even with the proposed new site residential and recreational facilities, the future total hourly traffic volumes will still remain well below the RTA's maximum environmental traffic capacity threshold (300 vehicles/hr) for a local street (refer to RTA Guide to Traffic Generating Developments; October 2002; issue 2.2). Therefore, these predicted future peak hourly traffic volumes on River Road and Myrtle Creek Drive are considered acceptable.

Table 2: Predicted Two – Way Traffic Increases on the Affected Roads

Road	Scenario	AM Peak			PM Peak		
		Existing traffic	Site Traffic	Total Traffic	Existing traffic	Site Traffic	Total Traffic
River Rd	Weekday	84	65	149	97	65	162
	Weekend	63	65	128	55	66	121
Remembrance Dr (North)	Weekday	827	65	892	954	65	1019
	Weekend	801	65	866	561	66	627
Myrtle Cr Dr	Weekday	35	27	62	68	27	95
	Weekend*	27	65	92	39	64	103

*- existing weekend traffic on Myrtle creek is calculated based on ratio of weekday and weekend traffic on River Road as both the roads are similar classification/ pattern

Remembrance Drive, which is an Arterial Road, currently carries about 800 – 1000 vehicles per hour during the peak hours. As per the RTA's Road Classification, peak hourly traffic volumes for an arterial road can normally be between 1,500 – 5,600 vehicles. With the additional predicted site redevelopment traffic, the maximum traffic volume at any time (the weekday pm peak) will be 1019 vehicles per hour which is still well below the acceptable RTA range for an Arterial Road. Therefore, the traffic impact due to the proposed development on Remembrance Drive will also be minimal.

4.4 Future Traffic Operations at Intersections

In urban areas, the traffic capacity of the major road network is generally a function of the performance of traffic intersections. This performance is quantified in terms of the Level of Service (LOS), which is an index of the operational performance of traffic at an intersection and is based on the average delay per vehicle. LOS ranges from A = very good to F = highly congested travel conditions, as shown in Table 3.

Table 3: Level of Service Definitions

Description	Level of Service (RTA Definition)	Average Delay per Vehicle (s)
Very Good	A	< 14.5
Good	B	14.5 ≤ 28.5
Satisfactory	C	28.5 ≤ 42.5
Near Capacity	D	42.5 ≤ 56.5
At Capacity	E	56.5 ≤ 70.5
Over Capacity	F	≥ 70.5

Generally it is desirable to aim at achieving a Level of Service of C or better at all major road intersections. However, in practice, it is reasonable for some intersections to operate at Level of Service D at peak times.

Another common measure of intersection performance is the degree of saturation (DOS), which provides an overall measure of the capability of the intersection to accommodate additional traffic. A DOS of 1.0 indicates that an intersection is operating at capacity. The desirable maximum degree of saturation for an intersection with traffic signals is 0.9.

Sidra intersection modelling program has been used to assess the three major intersections discussed in the previous section. The existing intersection performance is assessed in this report in terms of the following four factors for each intersection:

- Degree of Saturation
- Average Delay (AVD) in seconds per vehicle
- Level of Service
- Length and direction of peak traffic queue (95th percentile traffic queue)

As long as the intersection traffic queues are managed such that they do not affect the adjacent intersections, the Sidra analysis is appropriate. The surveyed three intersections have been analysed by the Sidra modelling software. The results of the existing and future intersection performance (based on forecast traffic) are presented in Table 4, Table 5 and **Appendix B**.

4.4.1 Remembrance Drive & River Road Intersection

This intersection is currently operating at LOS A in both the weekday am and pm peak periods. The AVD and DOS are very low which indicates that the intersection has significant spare capacity to accommodate additional traffic.

With to the additional residential traffic during the weekday, the intersection will operate at LOS A & B in both the am and pm peak periods. The vehicles turning right from River Road will experience the highest delay (LOS B). However, the DOS, AVD and the maximum queue lengths will be well within the acceptable limit which will ensure that the intersection continues to operate at a satisfactory level.

No intersection traffic count was undertaken during the weekend. However, the weekend intersection traffic volumes have been estimated based on the weekday intersection count and the weekend traffic tube count data taken from both Remembrance Drive and River Road at the same periods. A detailed analysis of this traffic data reveals that:

- Weekend (Saturday) am peak through traffic on the road network (Remembrance Drive) is approximately 75% of the weekday am peak through traffic;
- Weekend (Sunday) pm peak through traffic on the road network (Remembrance Drive) is approximately 60% of the weekday am peak through traffic;
- Weekend (Saturday) am peak turning traffic on the road network (River Road) is almost exactly the same as weekday am peak turning traffic; and
- Weekend (Sunday) pm peak turning traffic on the road network (River Road) is approximately 60% of the weekday pm peak turning traffic.

The weekend Sidra analysis shows that the intersection is currently operating at LOS A in both the am and pm peak periods. The DOS is around the 0.20 mark and maximum queue length is around two vehicles only.

With the additional site visitor and residential traffic, the intersection will continue to operate at LOS A in all the scenarios. There will be a slight increase of both DOS and AVD but these will still remain well within acceptable limits.

4.4.2 Remembrance Drive & Myrtle Creek Avenue & York Street Intersection

On weekdays the intersection is currently operating at a peak hour LOS A on all the approaches. The intersection is currently operating at DOS of only 0.20 in the am peak and 0.31 capacity in the pm peak period respectively. Vehicles are currently experiencing only negligible delays.

There will also be only negligible future traffic impact due to additional residential traffic during the weekdays. The Sidra modelling shows that except for slight increases of the AVD and maximum queue, there will be virtually no change of the intersection performance.

During the weekend peak hours, the intersection is currently operating at LOS A and DOS is below 0.20 in both the peak periods. This indicates the intersection has significant spare capacity to accommodate additional traffic and there are only very minor vehicular delays at the intersection currently.

With the additional site traffic on weekends, the intersection will continue to operate at LOS A on all the approaches. Although there is slight increase in the DOS for the Saturday am peak, it will remain the same for the Sunday pm peak. However on the Sunday pm peak, there will be a slight increase in AVD.

Overall, there will be only a very minor traffic impact due the additional site traffic and the planned development will have an acceptable impact on this intersection.

4.4.3 River Road & Moorland Road Intersection

Due to the minimal volume of current traffic, traffic at this intersection is always free flowing. During the weekday peaks, vehicles at this intersection are currently experiencing delays of less than two seconds on average.

With the additional residential traffic, the intersection will continue to operate at LOS A on all the three approaches. The average traffic delay will still be very minor (less than six seconds) with significant available spare traffic capacity.

During the weekend peaks, the intersection is also operating at LOS A currently on all approaches. The AVD and maximum queues are also generally better than during the weekday peaks. With the additional site traffic, there will be only very minor changes in the weekend peak traffic operation of this intersection.

Overall, there will be only a very minor traffic impact due the additional site traffic at this intersection and the planned development will have an acceptable traffic impact at this location.

Table 4: Existing and Future Weekday Intersection Performance

Intersection	Scenario	AM Peak				PM Peak			
		LOS	DOS	AVD (sec)	Max Queue (m)	LOS	DOS	AVD (sec)	Max Queue (m)
Remembrance Dr & River Road	Existing	A	0.27	2.7	15.1	A	0.32	3.3	12.3
	Future	A & B	0.27	3.6	15.2	A & B	0.34	4.0	12.9
Remembrance Dr & Myrtle Cr Ave & York St	Existing	A	0.20	3.2	11.6	A	0.31	3.5	24.0
	Future	A	0.21	3.4	11.9	A	0.31	3.8	24.2
River Rd & Moorland Rd	Existing	A	0.01	1.4	0.5	A	0.02	1.8	0.6
	Future	A	0.07	5.0	2.3	A	0.04	4.7	1.1

Table 5: Existing and Future Weekend Intersection Performance

Intersection	Scenario	Saturday (AM Peak)				Sunday (PM Peak)			
		LOS	DOS	AVD (sec)	Max Queue (m)	LOS	DOS	AVD (sec)	Max Queue (m)
Remembrance Dr & River Road	Existing	A	0.20	2.6	10.1	A	0.19	2.7	5.6
	Future	A	0.20	3.5	10.3	A	0.21	3.6	5.8
Remembrance Dr & Myrtle Cr Ave & York St	Existing	A	0.15	3.1	7.9	A	0.18	2.4	11.3
	Future	A	0.18	3.8	8.2	A	0.18	3.2	11.7
River Rd & Moorland Rd	Existing	A	0.01	1.7	0.4	A	0.01	1.9	0.4
	Future	A	0.07	5.6	2.2	A	0.07	5.6	2.2

Note: AVD – Average Vehicle Delay

4.5 Traffic Safety

As stated earlier, the existing road width and sight distance are currently insufficient on some parts of the southern section of River Road currently (refer to Figure 3 and Photograph 6).

Therefore, this hilly section of River Road should be resurveyed and redesigned with a new minimum 6.0 metre sealed width road carriageway, generally to be designed according to Section 3 of the RTA 'Road Design Guide'. To further improve the safety and comfort of the future road users, the following measures should generally be considered for the southern section of River Road (south of Tahmoor Duck Hatchery):

- Provide sufficient road sealed width (at least 6m) to ensure that all vehicles (including heavy vehicles) will able to accurately negotiate opposing traffic especially on the curve section of the roadway;
- Provide sufficient safe shoulder width, sealed or unsealed, on both sides of the roadway;
- Remove vegetation on the western side of River Road generally to improve visibility;
- Install "Type BB" centre line (unbroken line) markings to prohibit overtaking on the hilly section of River Road. Provide edge lines on both sides of the roadway;
- Install a safety barrier on the eastern side of River Road to improve vehicular safety on the hilly section. The Safety barrier should not be installed closer than 0.25m to the outer edge line;
- Restrict the posted vehicular traffic speed limit to 40km/h on the hilly section of River Road.

4.6 Parking Impact

The development is unlikely to have any significant parking impact in the existing local residential streets of Tahmoor (e.g. River Road) as the site is located reasonably far away from the existing residential sections of River Road and the site will provide sufficient on – site parking for its residents and visitors at all times.

Due to the proposed rezoning development, the only potential parking impact could occur near the Tahmoor Town Centre, e.g. during the weekends. Therefore, following the site development, parking situation near the town centre could be monitored and discussions could be held by Council with the local businesses, in relation to the need for additional customer car parking in the vicinity of the local retail shops and/or additional commuter car parking in the vicinity of the Tahmoor Railway Station.

4.7 Public Transport Pedestrian and Cyclist Impact

The development is unlikely to have any significant impact on current public transport, pedestrian or cyclist activity or operations.

It is understood that Wollondilly Shire Council has written to the Minister for Transport and Shadow Minister for Transport asking for consideration for better bus services in Wollondilly.

Should demand for local public transport services in the area increase in the future with the proposed rezoning development, CityRail and Picton Buslines should consider the increased frequencies of services.

5 Summary & Recommendation

This report has assessed the anticipated traffic and transport impacts for the proposed rezoning and subsequent re-development of the subject site at the south – eastern end of River Road, Tahmoor.

As such, the proposed rezoning development will contribute positively towards achieving Council's long term strategic growth plan goals.

The key findings of this traffic and transport impact assessment report are summarised below:

- The forecast traffic generated by the site development can be accommodated by the surrounding road network with only minimal impact. There will be only negligible traffic effects on either the existing local roads or main roads in the Tahmoor Urban area;
- The rural section of River Road, in particular the end section (between the site and Tahmoor Duck Hatchery) will require some upgrading to cater for the future site traffic. This section of the roadway would need to be resurveyed and redesigned in accordance with Section 3 of the RTA Road Design Guide;
- The site currently has poor public transport accessibility as it is not directly served by any existing bus services. However, following the site redevelopment, discussions should be held with the relevant public transport authorities, in relation to any demand for improved public transport services;
- The proposed development will provide sufficient on – site parking provision for all the anticipated future resident and visitor needs. Any additional parking impact in the nearby residential streets is likely to be low. However, potential increased parking demand may occur near the Tahmoor Town Centre especially during shopping hours on weekends. Therefore following the site development, parking conditions near the town centre should be monitored and appropriate action could be taken in due course; and
- The proposed development is recommended as suitable for this area in traffic and transport terms as it will generate relatively moderate future levels of vehicular traffic which will remain compatible with the existing semi rural nature of the local environment and surrounding land uses.

Appendix A

Traffic Survey Data

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Traffic Count Summary Report

Count Number	**6222**	Ref : **ARUP**	**Lat/Long : S34 12 42.4 / E150 36 23.0**	**UBD 370 J-6**
Street	**REMEMBRANCE DRIVE, TAHMOOR : Between RIVER ROAD & STILTON LANE (bidirectional) :**			
Location	East of River Road, 15m west of Stilton Lane, on Blackspot Sign			*Carriageway*

TOTAL COUNT MATRIX

Start Date	23-AUG-10
Start Time	1500
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	74
Weekly 85th Percentile Speed	79
Five Day AADT	10329
Seven Day AADT	9524

	MON	TUE	WED	THU	FRI	SAT	SUN	5 Day		7 Day	
	23RD / 30TH	*24TH*	*25TH*	*26TH*	*27TH*	*28TH*	*29TH*	Total	Average	Total	Average
Midnight - 1am	21	17	29	24	31	81	89	**122**	**24**	**292**	**42**
1am - 2am	12	15	18	21	17	33	44	**83**	**17**	**160**	**23**
2am - 3am	19	25	10	20	22	23	21	**96**	**19**	**140**	**20**
3am - 4am	30	28	34	33	36	19	16	**161**	**32**	**196**	**28**
4am - 5am	110	114	129	104	114	56	17	**571**	**114**	**644**	**92**
5am - 6am	299	268	250	280	299	103	43	**1396**	**279**	**1542**	**220**
6am - 7am	486	468	486	454	468	159	69	**2362**	**472**	**2590**	**370**
7am - 8am	594	560	588	567	557	271	136	**2866**	**573**	**3273**	**468**
8am - 9am	**735**	**752**	**813**	**827**	793	454	276	**3920**	**784**	**4650**	**664**
9am - 10am	679	675	729	769	**798**	647	430	**3650**	**730**	**4727**	**675**
10am - 11am	567	578	582	627	649	728	542	**3003**	**601**	**4273**	**610**
11am - Midday	549	522	553	640	663	**801**	**620**	**2927**	**585**	**4348**	**621**
Midday - 1pm	581	597	679	573	613	704	**561**	**3043**	**609**	**4308**	**615**
1pm - 2pm	582	574	623	617	673	**726**	501	**3069**	**614**	**4296**	**614**
2pm - 3pm	629	686	684	680	769	594	512	**3448**	**690**	**4554**	**651**
3pm - 4pm	**891**	**895**	**916**	**954**	**1008**	625	547	**4664**	**933**	**5836**	**834**
4pm - 5pm	870	834	875	882	896	560	519	**4357**	**871**	**5436**	**777**
5pm - 6pm	778	806	853	869	797	594	493	**4103**	**821**	**5190**	**741**
6pm - 7pm	516	563	687	680	640	451	325	**3086**	**617**	**3862**	**552**
7pm - 8pm	309	311	341	344	404	310	234	**1709**	**342**	**2253**	**322**
8pm - 9pm	171	196	299	274	252	226	162	**1192**	**238**	**1580**	**226**
9pm - 10pm	135	136	263	274	158	211	114	**966**	**193**	**1291**	**184**
10pm - 11pm	84	105	107	131	131	171	53	**558**	**112**	**782**	**112**
11pm - Midnight	40	49	40	56	106	120	36	**291**	**58**	**447**	**64**
Total	**9687**	**9774**	**10588**	**10700**	**10894**	**8667**	**6360**	**51643**	**10328**	**66670**	**9524**

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Hourly Classification Summary

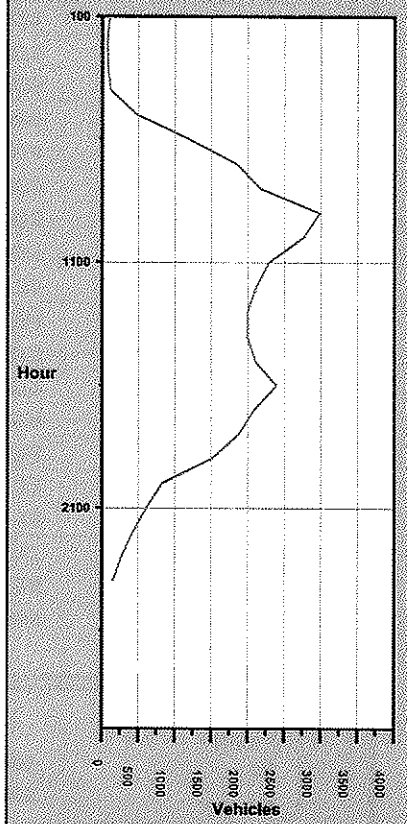
Count Number	**6222**	Ref : **ARUP**	**Lat/Long : S34 12 42.4 / E150 36 23.0** **UBD 370 J-6**
Street	**REMEMBRANCE DRIVE, TAHMOOR : From RIVER ROAD to STILTON LANE : EAST BOUND**		
Location	East of River Road, 15m west of Stilton Lane, on Blackspot Sign		*Carriageway*

Start Date	23-AUG-10
Start Time	1500
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**75**
Weekly 85th Percentile Speed	**83**
Five Day AADT	**5031**
Seven Day AADT	**4641**

THE BODY OF THIS REPORT SHOWS : SEVENDAY TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	0	98	0	4	1	0	0	0	0	1	0	0	0	0	**104**	**15**
1am - 2am	0	62	1	6	0	0	0	0	1	0	0	0	0	0	**70**	**10**
2am - 3am	0	69	0	5	1	0	0	1	0	0	0	0	0	0	**76**	**11**
3am - 4am	0	108	1	2	2	0	0	0	0	2	0	0	0	0	**115**	**16**
4am - 5am	0	442	3	23	7	1	0	2	0	1	0	0	0	0	**479**	**68**
5am - 6am	1	1109	10	59	11	0	0	1	2	8	0	0	0	0	**1201**	**172**
6am - 7am	4	1657	20	125	19	1	2	1	6	10	0	0	0	0	**1845**	**264**
7am - 8am	5	2000	26	87	20	2	11	4	6	11	0	0	0	0	**2172**	**310**
8am - 9am	5	2768	30	150	17	2	1	0	1	10	0	0	0	0	**2984**	**426**
9am - 10am	10	2545	44	124	26	3	1	4	2	9	1	0	0	0	**2769**	**396**
10am - 11am	8	2128	37	72	27	8	5	3	3	3	1	0	0	0	**2295**	**328**
11am - Midday	15	1954	33	78	27	3	2	1	0	6	0	0	0	0	**2119**	**303**
Midday - 1pm	8	1835	25	81	26	9	1	2	4	10	0	0	0	0	**2001**	**286**
1pm - 2pm	11	1831	22	85	29	2	7	1	0	7	2	0	0	0	**1997**	**285**
2pm - 3pm	7	1912	43	99	22	1	6	2	2	9	1	0	0	0	**2104**	**301**
3pm - 4pm	15	2174	39	131	20	1	5	5	5	4	0	0	0	0	**2399**	**343**
4pm - 5pm	7	1927	30	106	5	0	0	2	5	3	0	0	0	0	**2085**	**298**
5pm - 6pm	8	1779	10	61	9	0	0	0	1	6	0	0	0	0	**1874**	**268**
6pm - 7pm	5	1455	13	25	3	0	2	0	3	1	0	0	0	0	**1507**	**215**
7pm - 8pm	0	797	8	15	4	0	1	0	1	0	0	0	0	0	**826**	**118**
8pm - 9pm	1	599	4	5	1	0	0	0	1	2	0	0	0	0	**613**	**88**
9pm - 10pm	0	422	0	1	1	0	0	0	1	1	0	0	0	0	**426**	**61**
10pm - 11pm	0	256	3	7	4	0	0	0	0	0	0	0	0	0	**270**	**39**
11pm - Midnigh	1	145	0	5	1	0	0	0	0	2	0	0	0	0	**154**	**22**
Total	111	30072	402	1356	283	33	44	29	44	106	5	0	0	0	**32485**	**4641**
% of Total		93	1	4	1											



 CFE Information Technologies

Data displayed has been compiled from pneumatic traffic count processes and is subject to the documented limitations

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Hourly Classification Summary

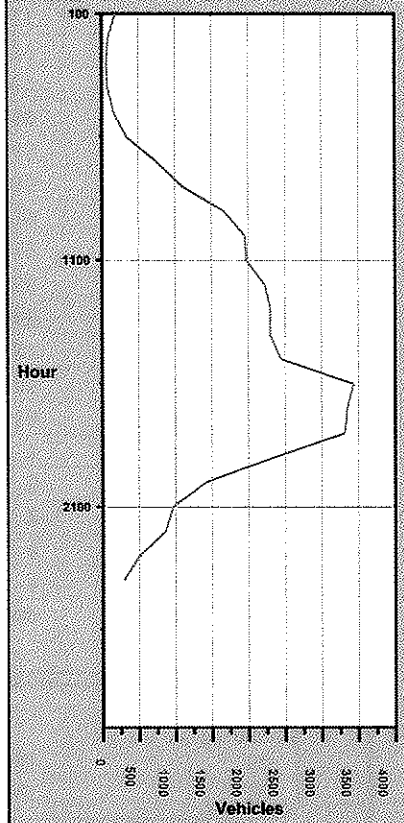
Count Number	**6222**	Ref : **ARUP**	**Lat/Long : S34 12 42.4 / E150 36 23.0**	**UBD 370 J-6**
Street	**REMEMBRANCE DRIVE, TAHMOOR : From STILTON LANE to RIVER ROAD : WEST BOUND**			
Location	East of River Road, 15m west of Stilton Lane, on Blackspot Sign			*Carriageway*

Start Date	23-AUG-10
Start Time	1500
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**73**
Weekly 85th Percentile Speed	**79**
Five Day AADT	**5298**
Seven Day AADT	**4884**

THE BODY OF THIS REPORT SHOWS : SEVENDAY TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	0	177	2	8	0	0	1	0	0	0	0	0	0	0	**188**	**27**
1am - 2am	1	77	2	10	0	0	0	0	0	0	0	0	0	0	**90**	**13**
2am - 3am	0	54	0	7	2	0	0	0	0	1	0	0	0	0	**64**	**9**
3am - 4am	1	66	1	4	2	0	0	2	1	3	1	0	0	0	**81**	**12**
4am - 5am	1	121	1	17	9	2	0	0	5	6	3	0	0	0	**165**	**24**
5am - 6am	1	291	3	33	2	0	0	3	3	5	0	0	0	0	**341**	**49**
6am - 7am	2	627	4	73	15	4	4	3	4	9	0	0	0	0	**745**	**106**
7am - 8am	8	921	23	106	19	1	8	4	7	4	0	0	0	0	**1101**	**157**
8am - 9am	12	1431	35	141	25	3	6	1	4	8	0	0	0	0	**1666**	**238**
9am - 10am	8	1769	33	95	32	3	5	0	1	11	1	0	0	0	**1958**	**280**
10am - 11am	9	1776	37	99	34	6	3	1	3	9	1	0	0	0	**1978**	**283**
11am - Midday	22	2058	28	83	26	2	2	0	5	3	0	0	0	0	**2229**	**318**
Midday - 1pm	10	2131	44	76	26	6	3	1	2	8	0	0	0	0	**2307**	**330**
1pm - 2pm	8	2113	35	98	24	3	3	3	5	7	0	0	0	0	**2299**	**328**
2pm - 3pm	11	2248	36	102	25	3	3	3	5	14	0	0	0	0	**2450**	**350**
3pm - 4pm	15	3137	39	195	19	6	6	2	5	12	1	0	0	0	**3437**	**491**
4pm - 5pm	14	3148	37	112	16	0	7	3	3	10	1	0	0	0	**3351**	**479**
5pm - 6pm	9	3163	28	83	19	0	6	1	2	5	0	0	0	0	**3316**	**474**
6pm - 7pm	10	2257	16	48	9	1	4	1	2	7	0	0	0	0	**2355**	**336**
7pm - 8pm	1	1377	16	27	3	0	0	0	2	1	0	0	0	0	**1427**	**204**
8pm - 9pm	2	929	11	16	4	0	2	1	0	2	0	0	0	0	**967**	**138**
9pm - 10pm	1	839	5	11	6	0	1	1	0	1	0	0	0	0	**865**	**124**
10pm - 11pm	0	500	2	7	0	0	0	0	0	3	0	0	0	0	**512**	**73**
11pm - Midnigh	0	285	3	4	1	0	0	0	0	0	0	0	0	0	**293**	**42**
Total	146	31495	441	1455	318	40	64	30	59	129	8	0	0	0	**34185**	**4884**
% of Total		92	1	4	1											



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Traffic Count Summary Report

Count Number	**6221**	Ref : **ARUP**	**Lat/Long : S34 12 47.3 / E150 36 13.7**	**UBD 370 J-6**
Street	**RIVER ROAD, TAHMOOR : Between REMEMBRANCE DRIVE & PARK AVENUE (bidirectional) :**			
Location	50m south of Remembrance Drive, House No 4 ELP 496			*Carriageway*

TOTAL COUNT MATRIX

Start Date	23-AUG-10
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	50
Weekly 85th Percentile Speed	59
Five Day AADT	847
Seven Day AADT	784

	MON *23RD / 30TH*	TUE *24TH*	WED *25TH*	THU *26TH*	FRI *27TH*	SAT *28TH*	SUN *29TH*	5 Dav Total	5 Dav Average	7 Dav Total	7 Dav Average
Midnight - 1am	1	1	1	1	1	6	8	**5**	**1**	**19**	**3**
1am - 2am	0	1	1	2	1	1	3	**5**	**1**	**9**	**1**
2am - 3am	2	1	2	2	2	1	1	**9**	**2**	**11**	**2**
3am - 4am	5	3	4	9	4	2	2	**25**	**5**	**29**	**4**
4am - 5am	8	9	5	5	8	4	2	**35**	**7**	**41**	**6**
5am - 6am	20	19	19	20	15	8	7	**93**	**19**	**108**	**15**
6am - 7am	48	45	42	50	53	21	6	**238**	**48**	**265**	**38**
7am - 8am	55	54	**61**	54	63	22	12	**287**	**57**	**321**	**46**
8am - 9am	**61**	**57**	55	**84**	**69**	38	24	**326**	**65**	**388**	**55**
9am - 10am	56	48	**61**	73	57	53	39	**295**	**59**	**387**	**55**
10am - 11am	35	38	41	43	53	**63**	33	**210**	**42**	**306**	**44**
11am - Midday	41	26	31	52	45	46	**54**	**195**	**39**	**295**	**42**
Midday - 1pm	15	34	46	36	45	45	38	**176**	**35**	**259**	**37**
1pm - 2pm	40	35	43	45	50	50	35	**213**	**43**	**298**	**43**
2pm - 3pm	41	40	66	44	58	60	42	**249**	**50**	**351**	**50**
3pm - 4pm	**71**	81	**79**	**97**	75	55	40	**403**	**81**	**498**	**71**
4pm - 5pm	68	64	61	86	76	54	35	**355**	**71**	**444**	**63**
5pm - 6pm	67	**82**	67	85	**83**	**69**	**55**	**384**	**77**	**508**	**73**
6pm - 7pm	65	58	66	62	63	43	38	**314**	**63**	**395**	**56**
7pm - 8pm	28	31	26	35	30	12	23	**150**	**30**	**185**	**26**
8pm - 9pm	17	24	25	35	19	22	11	**120**	**24**	**153**	**22**
9pm - 10pm	11	19	18	26	12	21	17	**86**	**17**	**124**	**18**
10pm - 11pm	4	4	12	10	13	17	4	**43**	**9**	**64**	**9**
11pm - Midnight	2	4	3	3	5	12	1	**17**	**3**	**30**	**4**
Total	**761**	**778**	**835**	**959**	**900**	**725**	**530**	**4233**	**846**	**5488**	**784**

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Hourly Classification Summary

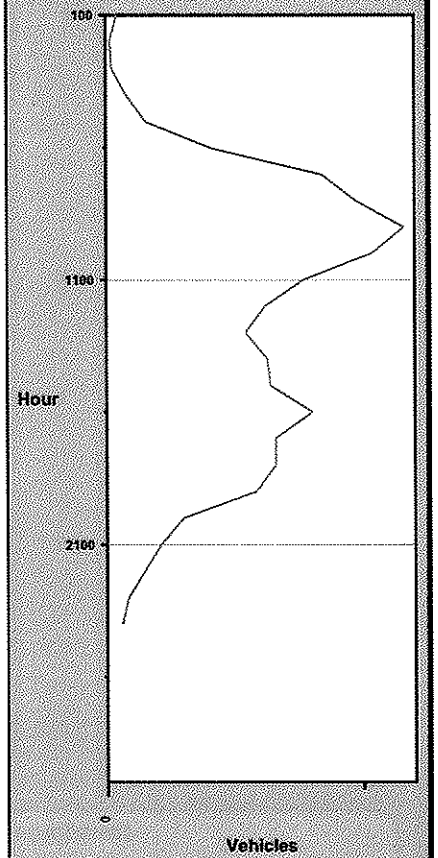
Count Number	**6221**	Ref : **ARUP**	**Lat/Long : S34 12 47.3 / E150 36 13.7**	**UBD 370 J-6**
Street	**RIVER ROAD, TAHMOOR : From PARK AVENUE to REMEMBRANCE DRIVE : NORTH BOUND**			
Location	50m south of Remembrance Drive, House No 4 ELP 496			*Carriageway*

Start Date	23-AUG-10
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**52**
Weekly 85th Percentile Speed	**60**
Five Day AADT	**443**
Seven Day AADT	**409**

THE BODY OF THIS REPORT SHOWS : SEVENDAY TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	0	11	0	0	0	0	0	0	0	0	0	0	0	0	**11**	**2**
1am - 2am	0	4	0	0	0	0	0	0	0	0	0	0	0	0	**4**	**1**
2am - 3am	0	6	0	0	0	0	0	0	0	0	0	0	0	0	**6**	**1**
3am - 4am	0	20	0	0	0	0	0	0	0	0	0	0	0	0	**20**	**3**
4am - 5am	0	36	1	2	0	0	0	0	0	0	0	0	0	0	**39**	**6**
5am - 6am	0	96	2	5	0	0	0	0	0	0	0	0	0	0	**103**	**15**
6am - 7am	0	202	1	6	0	0	0	0	0	1	0	0	0	0	**210**	**30**
7am - 8am	2	229	3	10	0	0	0	0	0	0	0	0	0	0	**244**	**35**
8am - 9am	0	284	0	6	0	0	0	0	0	0	0	0	0	0	**290**	**41**
9am - 10am	1	244	2	9	3	0	0	0	0	0	0	0	0	0	**259**	**37**
10am - 11am	1	178	3	10	0	0	0	0	1	0	0	0	0	0	**193**	**28**
11am - Midday	0	143	4	6	1	1	0	0	0	0	0	0	0	0	**155**	**22**
Midday - 1pm	1	121	3	8	3	0	0	0	0	0	0	0	0	0	**136**	**19**
1pm - 2pm	1	144	2	7	2	0	1	0	0	0	0	0	0	0	**157**	**22**
2pm - 3pm	0	149	3	7	0	0	0	0	1	0	0	0	0	0	**160**	**23**
3pm - 4pm	0	168	5	21	2	0	2	0	2	1	0	0	0	0	**201**	**29**
4pm - 5pm	0	159	2	4	0	0	0	0	0	0	0	0	0	0	**165**	**24**
5pm - 6pm	0	154	2	8	1	0	0	0	0	0	0	0	0	0	**165**	**24**
6pm - 7pm	0	145	0	1	0	0	0	0	0	0	0	0	0	0	**146**	**21**
7pm - 8pm	0	72	1	2	0	0	0	0	0	0	0	0	0	0	**75**	**11**
8pm - 9pm	0	51	0	2	0	0	0	0	0	0	0	0	0	0	**53**	**8**
9pm - 10pm	0	37	0	0	0	0	0	0	0	0	0	0	0	0	**37**	**5**
10pm - 11pm	0	21	0	0	0	0	0	0	0	0	0	0	0	0	**21**	**3**
11pm - Midnigh	0	14	0	1	0	0	0	0	0	0	0	0	0	0	**15**	**2**
Total	6	2688	34	115	12	1	3	0	4	2	0	0	0	0	**2865**	**409**
% of Total		94	1	4												



CFEIT Bob.White@cfeit.com (02) 9740 8600

Hourly Classification Summary

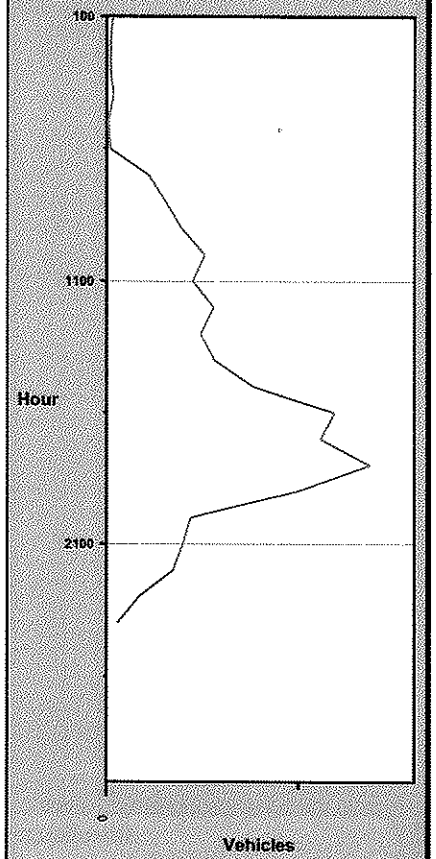
Count Number	**6221**	Ref : **ARUP**	**Lat/Long : S34 12 47.3 / E150 36 13.7** **UBD 370 J-6**
Street	**RIVER ROAD, TAHMOOR : From REMEMBRANCE DRIVE to PARK AVENUE : SOUTH BOUND**		
Location	50m south of Remembrance Drive, House No 4 ELP 496		*Carriageway*

Start Date	23-AUG-10
Start Time	1300
Duration	7 DAYS
Interval	1 HOUR

Weekly 50th Percentile Speed	**49**
Weekly 85th Percentile Speed	**58**
Five Day AADT	**403**
Seven Day AADT	**375**

THE BODY OF THIS REPORT SHOWS : SEVENDAY TRAFFIC

Time	00	01	02	03	04	05	06	07	08	09	10	11	12	13	Total	Avg
Midnight - 1am	0	7	0	1	0	0	0	0	0	0	0	0	0	0	**8**	**1**
1am - 2am	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**	**1**
2am - 3am	0	5	0	0	0	0	0	0	0	0	0	0	0	0	**5**	**1**
3am - 4am	0	9	0	0	0	0	0	0	0	0	0	0	0	0	**9**	**1**
4am - 5am	0	2	0	0	0	0	0	0	0	0	0	0	0	0	**2**	
5am - 6am	0	4	0	1	0	0	0	0	0	0	0	0	0	0	**5**	**1**
6am - 7am	0	50	0	3	2	0	0	0	0	0	0	0	0	0	**55**	**8**
7am - 8am	0	70	0	2	2	0	0	1	0	2	0	0	0	0	**77**	**11**
8am - 9am	0	90	0	7	1	0	0	0	0	0	0	0	0	0	**98**	**14**
9am - 10am	1	112	1	10	4	0	0	0	0	0	0	0	0	0	**128**	**18**
10am - 11am	0	101	1	10	1	0	0	0	0	0	0	0	0	0	**113**	**16**
11am - Midday	0	123	5	8	3	1	0	0	0	0	0	0	0	0	**140**	**20**
Midday - 1pm	0	115	1	5	1	0	0	0	0	1	0	0	0	0	**123**	**18**
1pm - 2pm	1	127	3	5	1	0	1	0	0	3	0	0	0	0	**141**	**20**
2pm - 3pm	0	178	3	7	2	0	0	0	0	1	0	0	0	0	**191**	**27**
3pm - 4pm	0	274	2	12	7	0	1	0	0	1	0	0	0	0	**297**	**42**
4pm - 5pm	1	264	1	9	0	0	1	2	0	1	0	0	0	0	**279**	**40**
5pm - 6pm	1	334	2	6	0	0	0	0	0	0	0	0	0	0	**343**	**49**
6pm - 7pm	0	243	1	4	0	0	0	1	0	0	0	0	0	0	**249**	**36**
7pm - 8pm	0	107	1	2	0	0	0	0	0	0	0	0	0	0	**110**	**16**
8pm - 9pm	0	96	0	3	1	0	0	0	0	0	0	0	0	0	**100**	**14**
9pm - 10pm	0	85	0	2	0	0	0	0	0	0	0	0	0	0	**87**	**12**
10pm - 11pm	0	42	0	1	0	0	0	0	0	0	0	0	0	0	**43**	**6**
11pm - Midnigh	0	15	0	0	0	0	0	0	0	0	0	0	0	0	**15**	**2**
Total	4	2458	21	98	25	1	3	4	0	9	0	0	0	0	**2623**	**375**
% of Total		94	1	4	1											



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Arup

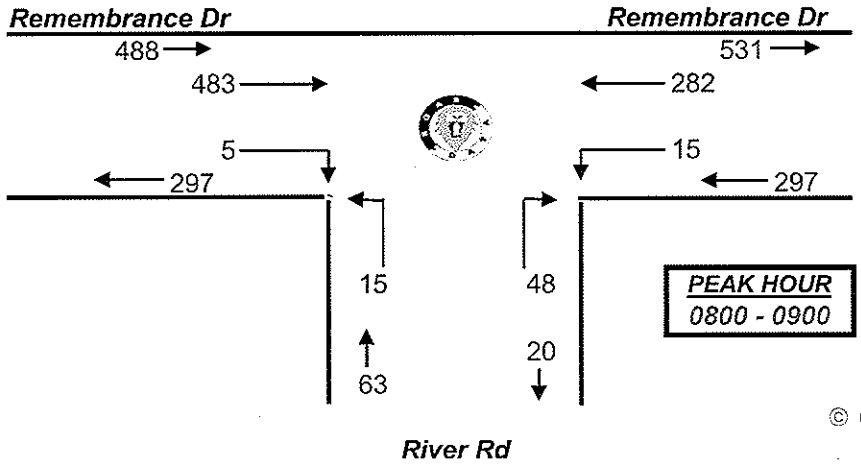
Job No/Name : 3250 TAHMOOR Traffic Counts

Day/Date : Thursday 26th August 2010

All Vehicles

	WEST		SOUTH		EAST		
	Remembra		*River Rd*		*Remembran*		
Time Per	T	R	L	R	L	T	TOTAL
0700 - 0715	68	1	2	5	0	31	**107**
0715 - 0730	79	4	1	9	0	47	**140**
0730 - 0745	103	1	1	10	2	36	**153**
0745 - 0800	100	3	1	11	5	59	**179**
0800 - 0815	111	1	5	14	5	50	**186**
0815 - 0830	116	1	2	11	4	60	**194**
0830 - 0845	117	3	3	13	3	78	**217**
0845 - 0900	139	0	5	10	3	94	**251**
Period End	**833**	**14**	**20**	**83**	**22**	**455**	**1427**

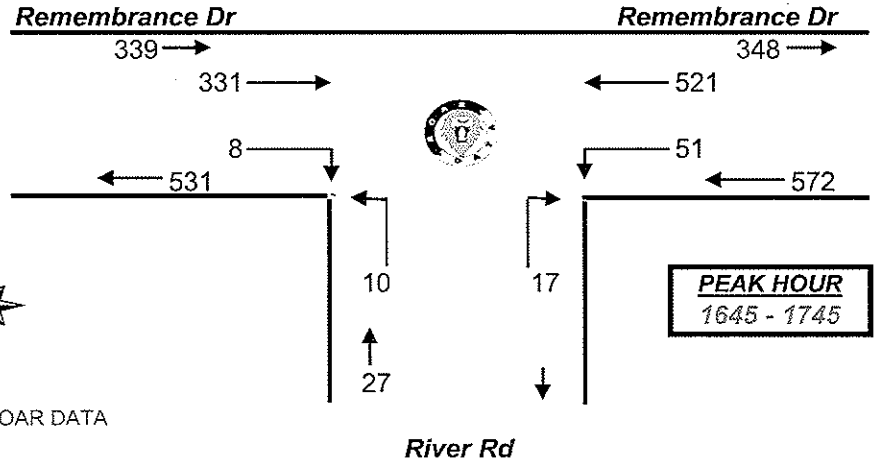
	WEST		SOUTH		EAST		
	Remembra		*River Rd*		*Remembran*		
Peak Per	T	R	L	R	L	T	TOTAL
0700 - 0800	350	9	5	35	7	173	**579**
0715 - 0815	393	9	8	44	12	192	**658**
0730 - 0830	430	6	9	46	16	205	**712**
0745 - 0845	444	8	11	49	17	247	**776**
0800 - 0900	483	5	15	48	15	282	**848**
PEAK HR	**483**	**5**	**15**	**48**	**15**	**282**	**848**



All Vehicles

	WEST		SOUTH		EAST		
	Remembran		*River Rd*		*Remembran*		
Time Per	T	R	L	R	L	T	TOTAL
1600 - 1615	93	7	0	6	16	126	**248**
1615 - 1630	81	6	0	12	8	126	**233**
1630 - 1645	92	1	3	8	7	110	**221**
1645 - 1700	60	1	1	4	13	138	**217**
1700 - 1715	98	1	6	4	11	133	**253**
1715 - 1730	89	3	1	3	16	121	**233**
1730 - 1745	84	3	2	6	11	129	**235**
1745 - 1800	71	4	3	5	10	121	**214**
Period End	**668**	**26**	**16**	**48**	**92**	**1004**	**1854**

	WEST		SOUTH		EAST		
	Remembran		*River Rd*		*Remembran*		
Peak Per	T	R	L	R	L	T	TOTAL
1600 - 1700	326	15	4	30	44	500	**919**
1615 - 1715	331	9	10	28	39	507	**924**
1630 - 1730	339	6	11	19	47	502	**924**
1645 - 1745	331	8	10	17	51	521	**938**
1700 - 1800	342	11	12	18	48	504	**935**
PEAK HR	**331**	**8**	**10**	**17**	**51**	**521**	**938**



R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Arup

Job No/Name : 3250 TAHMOOR Traffic Counts

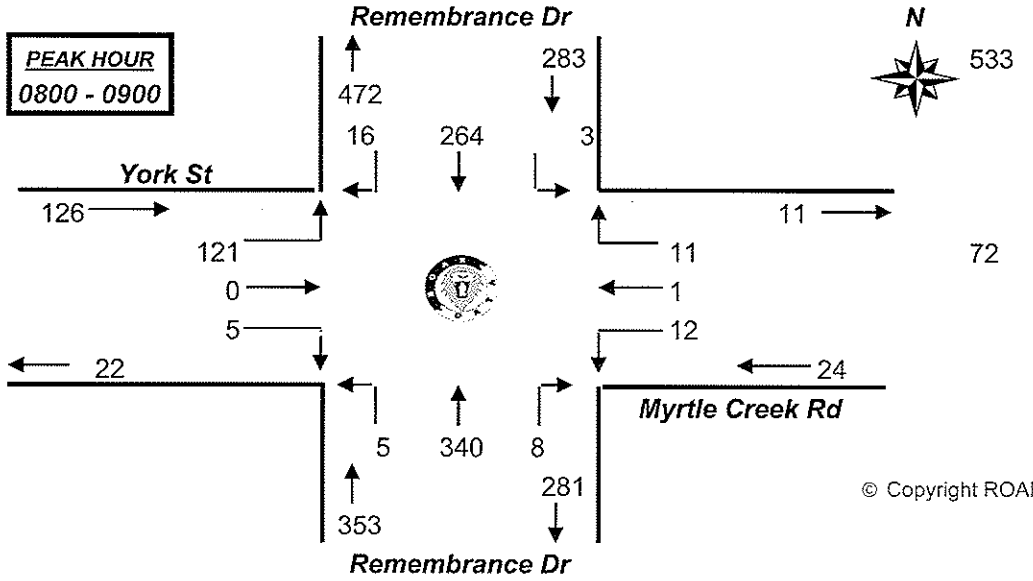
Day/Date : Thursday 26th August 2010

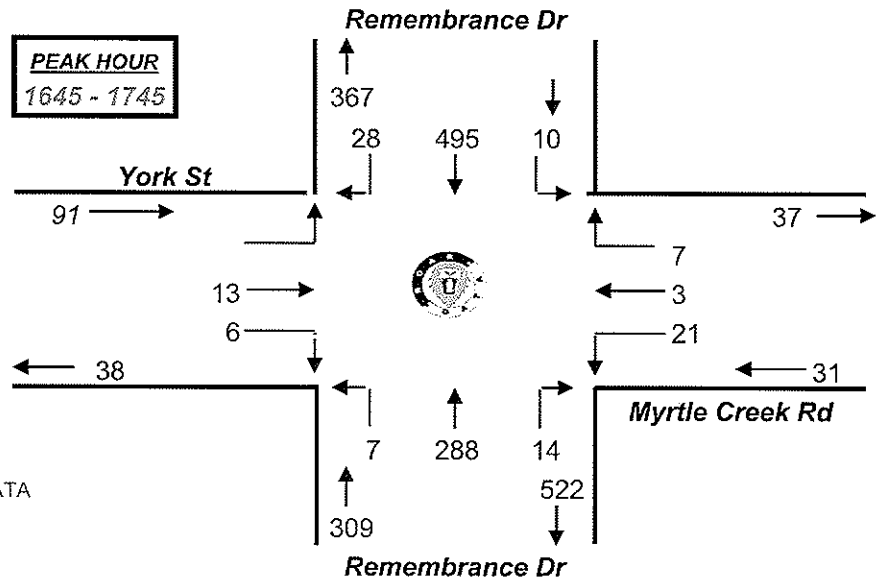
All Vehicles	NORTH Remembrance Dr			WEST York St			SOUTH Remembrance			EAST Myrtle Creek Rd			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0715	0	31	0	1	0	0	1	69	0	1	0	2	105
0715 - 0730	0	40	1	0	1	0	0	66	1	3	1	2	115
0730 - 0745	0	38	1	5	0	1	0	87	0	2	0	3	137
0745 - 0800	0	56	2	5	0	0	0	96	0	1	0	3	163
0800 - 0815	0	58	1	9	0	1	0	96	2	8	0	2	177
0815 - 0830	0	51	7	33	0	0	2	85	6	1	0	4	189
0830 - 0845	2	68	3	29	0	1	0	77	0	1	1	3	185
0845 - 0900	1	87	5	50	0	3	3	82	0	2	0	2	235
Period End	3	429	20	132	1	6	6	658	9	19	2	21	1306

All Vehicles	NORTH Remembrance			WEST York St			SOUTH Remembrance			EAST Myrtle Creek			
Time Per	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1615	0	109	20	39	2	1	1	47	2	2	1	0	224
1615 - 1630	6	87	23	35	3	0	12	56	4	4	0	1	231
1630 - 1645	3	99	9	24	10	0	6	47	7	1	3	3	212
1645 - 1700	2	131	16	26	7	1	7	57	2	7	1	2	259
1700 - 1715	2	125	6	16	3	1	0	68	5	2	1	2	231
1715 - 1730	2	125	4	27	3	3	0	81	2	10	1	3	261
1730 - 1745	4	114	2	3	0	1	0	82	5	2	0	0	213
1745 - 1800	1	125	2	3	0	0	0	77	3	0	0	2	213
Period End	20	915	82	173	28	7	26	515	30	28	7	13	1844

Peak Time	NORTH Remembrance Dr			WEST York St			SOUTH Remembrance			EAST Myrtle Creek Rd			
	L	T	R	L	T	R	L	T	R	L	T	R	TOT
0700 - 0800	0	165	4	11	1	1	1	318	1	7	1	10	520
0715 - 0815	0	192	5	19	1	2	0	345	3	14	1	10	592
0730 - 0830	0	203	11	52	0	2	2	364	8	12	0	12	666
0745 - 0845	2	233	13	76	0	2	2	354	8	11	1	12	714
0800 - 0900	3	264	16	121	0	5	5	340	8	12	1	11	786
PEAK HOUR	3	264	16	121	0	5	5	340	8	12	1	11	786

Peak Time	NORTH Remembrance			WEST York St			SOUTH Remembrance			EAST Myrtle Creek			
	L	T	R	L	T	R	L	T	R	L	T	R	TOT
1600 - 1700	11	426	68	124	22	2	26	207	15	14	5	6	926
1615 - 1715	13	442	54	101	23	2	25	228	18	14	5	8	933
1630 - 1730	9	480	35	93	23	5	13	253	16	20	6	10	963
1645 - 1745	10	495	28	72	13	6	7	288	14	21	3	7	964
1700 - 1800	9	489	14	49	6	5	0	308	15	14	2	7	918
PEAK HOUR	10	495	28	72	13	6	7	288	14	21	3	7	964





R.O.A.R. DATA

Reliable, Original & Authentic Results

Ph.88196847, Fax 88196849, Mob.0418-239019

Client : Arup

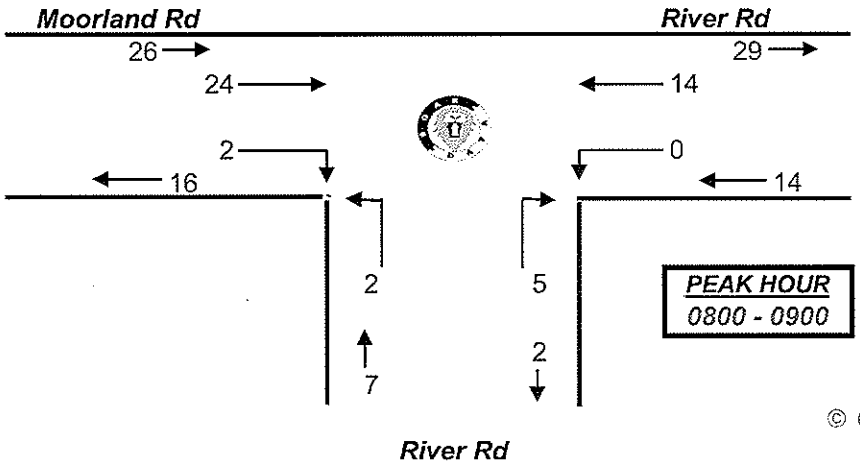
Job No/Name : 3250 TAHMOOR Traffic Counts

Day/Date : Thursday 26th August 2010

All Vehicles

	WEST		SOUTH		EAST		
	Moorland		*River Rd*		*River Rd*		
Time Per	T	R	L	R	L	T	TOTAL
0700 - 0715	1	1	2	2	1	1	8
0715 - 0730	2	0	0	1	0	1	4
0730 - 0745	3	0	0	1	1	2	7
0745 - 0800	1	0	1	2	1	1	6
0800 - 0815	6	0	0	2	0	5	13
0815 - 0830	6	0	0	1	0	2	9
0830 - 0845	4	2	2	0	0	2	10
0845 - 0900	8	0	0	2	0	5	15
Period End	**31**	**3**	**5**	**11**	**3**	**19**	**72**

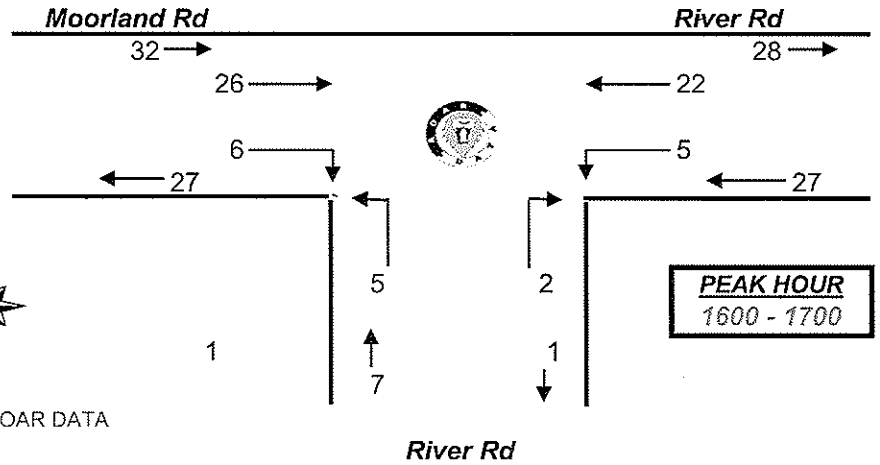
	WEST		SOUTH		EAST		
	Moorland		*River Rd*		*River Rd*		
Peak Per	T	R	L	R	L	T	TOTAL
0700 - 0800	7	1	3	6	3	5	25
0715 - 0815	12	0	1	6	2	9	30
0730 - 0830	16	0	1	6	2	10	35
0745 - 0845	17	2	3	5	1	10	38
0800 - 0900	24	2	2	5	0	14	47
PEAK HR	**24**	**2**	**2**	**5**	**0**	**14**	**47**



All Vehicles

	WEST		SOUTH		EAST		
	Moorland		*River Rd*		*River Rd*		
Time Per	T	R	L	R	L	T	TOTAL
1600 - 1615	10	3	1	1	4	7	26
1615 - 1630	5	1	0	0	1	4	11
1630 - 1645	5	1	2	1	0	3	12
1645 - 1700	6	1	2	0	0	8	17
1700 - 1715	1	0	0	0	0	2	3
1715 - 1730	4	1	0	0	1	6	12
1730 - 1745	3	1	0	0	0	9	13
1745 - 1800	5	0	1	1	1	6	14
Period End	**39**	**8**	**6**	**3**	**7**	**45**	**108**

	WEST		SOUTH		EAST		
	Moorland		*River Rd*		*River Rd*		
Peak Per	T	R	L	R	L	T	TOTAL
1600 - 1700	26	6	5	2	5	22	66
1615 - 1715	17	3	4	1	1	17	43
1630 - 1730	16	3	4	1	1	19	44
1645 - 1745	14	3	2	0	1	25	45
1700 - 1800	13	2	1	1	2	23	42
PEAK HR	**26**	**6**	**5**	**2**	**5**	**22**	**66**



Appendix B

Sidra Results

MOVEMENT SUMMARY

Remembrance Dr & River Road Giveway Intersection
Existing Weekday AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	16	0.0	0.132	12.6	LOS A	0.5	3.8	0.56	0.71	39.4
3	R	51	0.0	0.132	13.2	LOS A	0.5	3.8	0.56	0.86	41.8
Approach		66	0.0	0.131	13.0	LOS A	0.5	3.8	0.56	0.83	41.2
East: Remembrance Dr (east)											
4	L	16	0.0	0.164	10.1	LOS A	0.0	0.0	0.00	1.34	57.1
5	T	297	3.0	0.164	2.6	LOS A	0.0	0.0	0.00	0.22	71.0
Approach		313	2.8	0.164	3.0	LOS A	0.0	0.0	0.00	0.27	70.2
West: Remembrance Dr (west)											
11	T	508	3.0	0.270	1.1	LOS A	2.1	15.1	0.42	0.00	54.1
12	R	5	0.0	0.263	8.8	LOS A	2.1	15.1	0.42	1.08	49.2
Approach		514	3.0	0.270	1.2	LOS A	2.1	15.1	0.42	0.01	54.1
All Vehicles		893	2.7	0.270	2.7	NA	2.1	15.1	0.28	0.16	57.0

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing Weekday PM Peak

Remembrance Dr & River Road Giveway Intersection
Existing Weekday PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	11	0.0	0.063	13.2	LOS A	0.2	1.7	0.62	0.81	38.9
3	R	18	0.0	0.063	13.8	LOS A	0.2	1.7	0.62	0.88	41.4
Approach		28	0.0	0.063	13.6	LOS A	0.2	1.7	0.62	0.86	40.5
East: Remembrance Dr (east)											
4	L	54	0.0	0.316	10.1	LOS A	0.0	0.0	0.00	1.34	57.1
5	T	548	3.0	0.316	2.6	LOS A	0.0	0.0	0.00	0.21	71.0
Approach		602	2.7	0.316	3.3	LOS A	0.0	0.0	0.00	0.31	69.6
West: Remembrance Dr (west)											
11	T	348	3.0	0.190	2.4	LOS A	1.7	12.3	0.56	0.00	51.6
12	R	8	0.0	0.191	10.1	LOS A	1.7	12.3	0.56	1.10	48.9
Approach		357	2.9	0.190	2.5	LOS A	1.7	12.3	0.56	0.03	51.5
All Vehicles		987	2.7	0.316	3.3	NA	1.7	12.3	0.22	0.22	60.0

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing Saturday AM Peak

Remembrance Dr & River Road Giveway Intersection
Existing Saturday AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	16	0.0	0.102	10.6	LOS A	0.4	3.0	0.46	0.64	40.9
3	R	51	0.0	0.102	11.1	LOS A	0.4	3.0	0.46	0.81	43.3
Approach		66	0.0	0.102	11.0	LOS A	0.4	3.0	0.46	0.77	42.7
East: Remembrance Dr (east)											
4	L	16	0.0	0.125	10.1	LOS A	0.0	0.0	0.00	1.34	57.1
5	T	223	3.0	0.125	2.6	LOS A	0.0	0.0	0.00	0.21	71.0
Approach		239	2.8	0.125	3.1	LOS A	0.0	0.0	0.00	0.29	69.9
West: Remembrance Dr (west)											
11	T	382	3.0	0.203	0.7	LOS A	1.4	10.1	0.34	0.00	55.8
12	R	5	0.0	0.202	8.5	LOS A	1.4	10.1	0.34	1.09	49.0
Approach		387	3.0	0.203	0.8	LOS A	1.4	10.1	0.34	0.01	55.7
All Vehicles		693	2.6	0.203	2.6	NA	1.4	10.1	0.23	0.18	57.7

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing Sunday PM Peak

Remembrance Dr & River Road Giveway Intersection
Existing Sunday PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	6	0.0	0.025	9.8	LOS A	0.1	0.7	0.44	0.65	41.5
3	R	12	0.0	0.025	10.3	LOS A	0.1	0.7	0.44	0.74	43.9
Approach		18	0.0	0.025	10.1	LOS A	0.1	0.7	0.44	0.71	43.1
East: Remembrance Dr (east)											
4	L	33	0.0	0.190	10.1	LOS A	0.0	0.0	0.00	1.34	57.1
5	T	329	3.0	0.190	2.6	LOS A	0.0	0.0	0.00	0.21	71.0
Approach		362	2.7	0.190	3.3	LOS A	0.0	0.0	0.00	0.31	69.5
West: Remembrance Dr (west)											
11	T	209	3.0	0.113	1.0	LOS A	0.8	5.6	0.39	0.00	54.6
12	R	5	0.0	0.114	8.8	LOS A	0.8	5.6	0.39	1.07	49.1
Approach		215	2.9	0.113	1.2	LOS A	0.8	5.6	0.39	0.03	54.5
All Vehicles		595	2.7	0.190	2.7	NA	0.8	5.6	0.16	0.22	61.7

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Future Weekday AM Peak (Oct10)

Remembrance Dr & River Road Giveway Intersection
Future Weekday AM Peak (Oct 2010)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	16	0.0	0.259	14.1	LOS A	1.2	8.6	0.64	0.79	38.3
3	R	105	0.0	0.258	14.7	LOS B	1.2	8.6	0.64	0.91	40.7
Approach		121	0.0	0.258	14.6	LOS B	1.2	8.6	0.64	0.90	40.4
East: Remembrance Dr (east)											
4	L	29	0.0	0.171	10.1	LOS A	0.0	0.0	0.00	1.34	57.1
5	T	297	3.0	0.171	2.6	LOS A	0.0	0.0	0.00	0.21	71.0
Approach		326	2.7	0.171	3.3	LOS A	0.0	0.0	0.00	0.31	69.5
West: Remembrance Dr (west)											
11	T	508	3.0	0.270	1.1	LOS A	2.1	15.2	0.43	0.00	53.9
12	R	5	0.0	0.263	8.9	LOS A	2.1	15.2	0.43	1.08	49.2
Approach		514	3.0	0.270	1.2	LOS A	2.1	15.2	0.43	0.01	53.9
All Vehicles		961	2.5	0.270	3.6	NA	2.1	15.2	0.31	0.22	55.4

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Future Weekday PM Peak (Oct10)

Remembrance Dr & River Road Giveway Intersection
Future Weekday PM Peak (Oct 2010)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	11	0.0	0.125	14.8	LOS B	0.5	3.5	0.69	0.88	37.8
3	R	39	0.0	0.125	15.3	LOS B	0.5	3.5	0.69	0.90	40.3
Approach		49	0.0	0.125	15.2	LOS B	0.5	3.5	0.69	0.90	39.8
East: Remembrance Dr (east)											
4	L	101	0.0	0.341	10.1	LOS A	0.0	0.0	0.00	1.33	57.1
5	T	548	3.0	0.341	2.6	LOS A	0.0	0.0	0.00	0.20	71.0
Approach		649	2.5	0.341	3.8	LOS A	0.0	0.0	0.00	0.38	68.5
West: Remembrance Dr (west)											
11	T	348	3.0	0.191	2.7	LOS A	1.8	12.9	0.58	0.00	51.2
12	R	8	0.0	0.191	10.4	LOS A	1.8	12.9	0.58	1.11	48.7
Approach		357	2.9	0.191	2.8	LOS A	1.8	12.9	0.58	0.03	51.1
All Vehicles		1056	2.5	0.341	4.0	NA	1.8	12.9	0.23	0.28	59.0

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS B. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Future Saturday AM Peak (Oct 10)

Remembrance Dr & River Road Giveway Intersection
Future Saturday AM Peak (Oct 2010)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	16	0.0	0.172	11.2	LOS A	0.8	5.3	0.52	0.67	40.4
3	R	89	0.0	0.171	11.8	LOS A	0.8	5.3	0.52	0.85	42.8
Approach		105	0.0	0.171	11.7	LOS A	0.8	5.3	0.52	0.82	42.4
East: Remembrance Dr (east)											
4	L	45	0.0	0.141	10.1	LOS A	0.0	0.0	0.00	1.33	57.1
5	T	223	3.0	0.141	2.6	LOS A	0.0	0.0	0.00	0.20	71.0
Approach		268	2.5	0.141	3.9	LOS A	0.0	0.0	0.00	0.39	68.3
West: Remembrance Dr (west)											
11	T	382	3.0	0.203	0.8	LOS A	1.4	10.3	0.36	0.00	55.3
12	R	5	0.0	0.202	8.6	LOS A	1.4	10.3	0.36	1.09	49.0
Approach		387	3.0	0.203	0.9	LOS A	1.4	10.3	0.36	0.01	55.2
All Vehicles		761	2.4	0.203	3.5	NA	1.4	10.3	0.26	0.26	56.3

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Remembrance Dr & River Road Giveway Intersection
Future Sunday PM Peak (Oct 2010)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	6	0.0	0.090	10.7	LOS A	0.4	2.7	0.51	0.71	40.8
3	R	52	0.0	0.090	11.2	LOS A	0.4	2.7	0.51	0.81	43.2
Approach		58	0.0	0.090	11.2	LOS A	0.4	2.7	0.51	0.80	42.9
East: Remembrance Dr (east)											
4	L	62	0.0	0.206	10.1	LOS A	0.0	0.0	0.00	1.33	57.1
5	T	329	3.0	0.206	2.6	LOS A	0.0	0.0	0.00	0.20	71.0
Approach		392	2.5	0.206	3.8	LOS A	0.0	0.0	0.00	0.38	68.5
West: Remembrance Dr (west)											
11	T	209	3.0	0.114	1.2	LOS A	0.8	5.8	0.41	0.00	54.3
12	R	5	0.0	0.114	8.9	LOS A	0.8	5.8	0.41	1.07	49.1
Approach		215	2.9	0.114	1.3	LOS A	0.8	5.8	0.41	0.03	54.2
All Vehicles		664	2.4	0.206	3.6	NA	0.8	5.8	0.18	0.30	59.7

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Existing Weekday AM Peak

Remembrance Dr & Myrtle Cr Dr & York St Giveway Intersection
Existing Weekday AM Peak (8am - 9am)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Remembrance Dr (south)											
1	L	5	0.0	0.195	8.3	LOS A	1.4	9.9	0.37	0.72	49.0
2	T	358	3.0	0.196	0.9	LOS A	1.4	9.9	0.37	0.00	53.3
3	R	8	0.0	0.196	8.6	LOS A	1.4	9.9	0.37	1.07	49.0
Approach		372	2.9	0.196	1.1	LOS A	1.4	9.9	0.37	0.03	53.2
East: Myrtle Cr Dr (east)											
4	L	13	0.0	0.043	11.0	LOS A	0.2	1.2	0.46	0.63	40.6
5	T	1	0.0	0.042	8.9	LOS A	0.2	1.2	0.46	0.67	40.7
6	R	12	0.0	0.043	11.3	LOS A	0.2	1.2	0.46	0.82	40.5
Approach		25	0.0	0.043	11.0	LOS A	0.2	1.2	0.46	0.72	40.6
North: Remembrance Dr (north)											
7	L	3	0.0	0.166	9.4	LOS A	1.6	11.6	0.52	0.53	49.0
8	T	278	3.0	0.164	2.0	LOS A	1.6	11.6	0.52	0.00	50.9
9	R	17	0.0	0.164	9.7	LOS A	1.6	11.6	0.52	1.02	48.9
Approach		298	2.8	0.164	2.5	LOS A	1.6	11.6	0.52	0.06	50.8
West: York St (west)											
10	L	127	0.0	0.135	8.8	LOS A	0.6	4.1	0.40	0.69	42.4
11	T	1	0.0	0.132	6.7	LOS A	0.6	4.1	0.40	0.65	42.4
12	R	5	0.0	0.135	9.1	LOS A	0.6	4.1	0.40	0.82	42.3
Approach		134	0.0	0.135	8.8	LOS A	0.6	4.1	0.40	0.70	42.4
All Vehicles		828	2.3	0.196	3.2	NA	1.6	11.6	0.43	0.17	49.8

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing Weekday PM Peak

Remembrance Dr & Myrtle Cr Dr & York St Giveway Intersection
Existing Weekday PM Peak (4.45pm - 5.45pm)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Remembrance Dr (south)											
1	L	7	0.0	0.175	9.4	LOS A	1.4	10.4	0.52	0.53	49.0
2	T	303	3.0	0.175	1.9	LOS A	1.4	10.4	0.52	0.00	50.9
3	R	15	0.0	0.175	9.7	LOS A	1.4	10.4	0.52	1.06	49.0
Approach		325	2.8	0.175	2.4	LOS A	1.4	10.4	0.52	0.06	50.8
East: Myrtle Cr Dr (east)											
4	L	22	0.0	0.058	11.6	LOS A	0.2	1.6	0.54	0.75	40.3
5	T	3	0.0	0.057	9.5	LOS A	0.2	1.6	0.54	0.76	40.3
6	R	7	0.0	0.058	11.8	LOS A	0.2	1.6	0.54	0.86	40.1
Approach		33	0.0	0.058	11.4	LOS A	0.2	1.6	0.54	0.77	40.2
North: Remembrance Dr (north)											
7	L	11	0.0	0.310	9.4	LOS A	3.3	24.0	0.56	0.49	49.1
8	T	521	3.0	0.306	2.0	LOS A	3.3	24.0	0.56	0.00	50.4
9	R	29	0.0	0.307	9.8	LOS A	3.3	24.0	0.56	1.00	49.1
Approach		561	2.8	0.306	2.5	LOS A	3.3	24.0	0.56	0.06	50.3
West: York St (west)											
10	L	76	0.0	0.122	9.8	LOS A	0.5	3.7	0.42	0.68	41.7
11	T	14	0.0	0.122	7.7	LOS A	0.5	3.7	0.42	0.70	41.9
12	R	6	0.0	0.121	10.1	LOS A	0.5	3.7	0.42	0.83	41.5
Approach		96	0.0	0.122	9.5	LOS A	0.5	3.7	0.42	0.69	41.7
All Vehicles		1015	2.4	0.306	3.5	NA	3.3	24.0	0.53	0.14	49.1

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Remembrance Dr & Myrtle Cr Dr & York St Giveway Intersection
Existing Saturday AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles											
Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Remembrance Dr (south)											
1	L	5	0.0	0.150	8.0	LOS A	1.0	6.8	0.30	0.79	48.9
2	T	268	3.0	0.149	0.6	LOS A	1.0	6.8	0.30	0.00	54.4
3	R	8	0.0	0.148	8.3	LOS A	1.0	6.8	0.30	1.07	48.8
Approach		282	2.9	0.149	0.9	LOS A	1.0	6.8	0.30	0.05	54.2
East: Myrtle Cr Dr (east)											
4	L	13	0.0	0.036	9.8	LOS A	0.1	1.0	0.38	0.60	41.5
5	T	1	0.0	0.036	7.8	LOS A	0.1	1.0	0.38	0.60	41.8
6	R	12	0.0	0.036	10.1	LOS A	0.1	1.0	0.38	0.77	41.4
Approach		25	0.0	0.036	9.9	LOS A	0.1	1.0	0.38	0.68	41.5
North: Remembrance Dr (north)											
7	L	3	0.0	0.126	8.8	LOS A	1.1	7.9	0.43	0.62	48.9
8	T	208	3.0	0.126	1.3	LOS A	1.1	7.9	0.43	0.00	52.3
9	R	17	0.0	0.126	9.1	LOS A	1.1	7.9	0.43	1.00	48.9
Approach		228	2.7	0.126	2.0	LOS A	1.1	7.9	0.43	0.08	52.0
West: York St (west)											
10	L	127	0.0	0.122	8.3	LOS A	0.5	3.8	0.34	0.65	42.6
11	T	1	0.0	0.117	6.2	LOS A	0.5	3.8	0.34	0.60	42.7
12	R	5	0.0	0.122	8.6	LOS A	0.5	3.8	0.34	0.79	42.6
Approach		134	0.0	0.122	8.3	LOS A	0.5	3.8	0.34	0.66	42.6
All Vehicles		669	2.1	0.149	3.1	NA	1.1	7.9	0.35	0.20	50.2

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing Sunday PM Peak

Remembrance Dr & Myrtle Cr Dr & York St Giveway Intersection
Existing Sunday PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Remembrance Dr (south)											
1	L	5	0.0	0.105	8.3	LOS A	0.7	4.9	0.37	0.70	48.9
2	T	182	3.0	0.105	0.9	LOS A	0.7	4.9	0.37	0.00	53.3
3	R	9	0.0	0.105	8.6	LOS A	0.7	4.9	0.37	1.03	48.9
Approach		197	2.8	0.105	1.5	LOS A	0.7	4.9	0.37	0.07	52.9
East: Myrtle Cr Dr (east)											
4	L	14	0.0	0.026	9.2	LOS A	0.1	0.7	0.40	0.63	42.1
5	T	2	0.0	0.026	7.1	LOS A	0.1	0.7	0.40	0.60	42.3
6	R	5	0.0	0.026	9.5	LOS A	0.1	0.7	0.40	0.76	41.9
Approach		21	0.0	0.026	9.1	LOS A	0.1	0.7	0.40	0.66	42.1
North: Remembrance Dr (north)											
7	L	6	0.0	0.180	8.3	LOS A	1.6	11.3	0.37	0.70	48.9
8	T	313	3.0	0.182	0.9	LOS A	1.6	11.3	0.37	0.00	53.3
9	R	18	0.0	0.183	8.7	LOS A	1.6	11.3	0.37	1.02	48.9
Approach		337	2.8	0.182	1.5	LOS A	1.6	11.3	0.37	0.07	52.9
West: York St (west)											
10	L	46	0.0	0.058	8.4	LOS A	0.2	1.7	0.28	0.62	42.8
11	T	8	0.0	0.058	6.3	LOS A	0.2	1.7	0.28	0.59	43.0
12	R	4	0.0	0.058	8.7	LOS A	0.2	1.7	0.28	0.76	42.6
Approach		59	0.0	0.058	8.1	LOS A	0.2	1.7	0.28	0.62	42.8
All Vehicles		614	2.4	0.182	2.4	NA	1.6	11.3	0.36	0.14	51.3

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Future Weekday AM Peak (Oct10)

Remembrance Dr & Myrtle Cr Dr & York St Giveway Intersection
Future Weekday AM Peak (Oct 10)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Remembrance Dr (south)											
1	L	28	0.0	0.209	8.3	LOS A	1.5	10.6	0.38	0.67	48.9
2	T	358	3.0	0.208	0.9	LOS A	1.5	10.6	0.38	0.00	53.0
3	R	8	0.0	0.211	8.6	LOS A	1.5	10.6	0.38	1.02	48.9
Approach		395	2.7	0.208	1.6	LOS A	1.5	10.6	0.38	0.07	52.6
East: Myrtle Cr Dr (east)											
4	L	13	0.0	0.043	11.0	LOS A	0.2	1.2	0.46	0.63	40.6
5	T	1	0.0	0.042	8.9	LOS A	0.2	1.2	0.46	0.67	40.7
6	R	12	0.0	0.043	11.3	LOS A	0.2	1.2	0.46	0.82	40.5
Approach		25	0.0	0.043	11.1	LOS A	0.2	1.2	0.46	0.72	40.6
North: Remembrance Dr (north)											
7	L	3	0.0	0.166	9.6	LOS A	1.7	11.9	0.54	0.51	48.9
8	T	278	3.0	0.165	2.2	LOS A	1.7	11.9	0.54	0.00	50.7
9	R	17	0.0	0.165	9.9	LOS A	1.7	11.9	0.54	1.02	48.8
Approach		298	2.8	0.165	2.7	LOS A	1.7	11.9	0.54	0.06	50.5
West: York St (west)											
10	L	127	0.0	0.149	9.0	LOS A	0.7	4.6	0.42	0.70	42.3
11	T	1	0.0	0.150	6.9	LOS A	0.7	4.6	0.42	0.68	42.3
12	R	11	0.0	0.148	9.3	LOS A	0.7	4.6	0.42	0.83	42.1
Approach		139	0.0	0.149	9.0	LOS A	0.7	4.6	0.42	0.71	42.2
All Vehicles		857	2.2	0.208	3.4	NA	1.7	11.9	0.44	0.19	49.5

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Future Weekday PM Peak (Oct10)

Remembrance Dr & Myrtle Cr Dr & York St Giveway Intersection
Future Weekday PM Peak (Oct 2010)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Remembrance Dr (south)											
1	L	16	0.0	0.179	9.4	LOS A	1.5	10.7	0.53	0.52	49.0
2	T	303	3.0	0.180	1.9	LOS A	1.5	10.7	0.53	0.00	50.7
3	R	15	0.0	0.180	9.7	LOS A	1.5	10.7	0.53	1.04	48.9
Approach		334	2.7	0.180	2.6	LOS A	1.5	10.7	0.53	0.07	50.6
East: Myrtle Cr Dr (east)											
4	L	22	0.0	0.058	11.6	LOS A	0.2	1.6	0.54	0.75	40.3
5	T	3	0.0	0.057	9.5	LOS A	0.2	1.6	0.54	0.76	40.3
6	R	7	0.0	0.058	11.9	LOS A	0.2	1.6	0.54	0.86	40.1
Approach		33	0.0	0.058	11.4	LOS A	0.2	1.6	0.54	0.77	40.2
North: Remembrance Dr (north)											
7	L	11	0.0	0.310	9.5	LOS A	3.4	24.2	0.57	0.48	49.1
8	T	521	3.0	0.307	2.1	LOS A	3.4	24.2	0.57	0.00	50.2
9	R	29	0.0	0.307	9.8	LOS A	3.4	24.2	0.57	1.00	49.1
Approach		561	2.8	0.307	2.6	LOS A	3.4	24.2	0.57	0.06	50.2
West: York St (west)											
10	L	76	0.0	0.183	11.1	LOS A	0.8	5.5	0.48	0.70	40.6
11	T	14	0.0	0.182	9.1	LOS A	0.8	5.5	0.48	0.73	40.7
12	R	26	0.0	0.183	11.4	LOS A	0.8	5.5	0.48	0.85	40.5
Approach		116	0.0	0.183	10.9	LOS A	0.8	5.5	0.48	0.73	40.6
All Vehicles		1043	2.4	0.307	3.8	NA	3.4	24.2	0.54	0.16	48.6

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Future Saturday AM Peak (Oct10)

Remembrance Dr & Myrtle Cr Dr & York St Giveway Intersection
Future Saturday AM Peak (Oct 10)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Remembrance Dr (south)											
1	L	44	0.0	0.169	8.0	LOS A	1.1	7.9	0.32	0.70	48.7
2	T	268	3.0	0.170	0.6	LOS A	1.1	7.9	0.32	0.00	53.8
3	R	8	0.0	0.168	8.4	LOS A	1.1	7.9	0.32	0.97	48.6
Approach		321	2.5	0.170	1.8	LOS A	1.1	7.9	0.32	0.12	53.0
East: Myrtle Cr Dr (east)											
4	L	13	0.0	0.036	9.9	LOS A	0.1	1.0	0.38	0.60	41.5
5	T	1	0.0	0.036	7.8	LOS A	0.1	1.0	0.38	0.60	41.7
6	R	12	0.0	0.036	10.1	LOS A	0.1	1.0	0.38	0.77	41.4
Approach		25	0.0	0.036	9.9	LOS A	0.1	1.0	0.38	0.68	41.5
North: Remembrance Dr (north)											
7	L	3	0.0	0.126	9.0	LOS A	1.1	8.2	0.46	0.59	48.9
8	T	208	3.0	0.127	1.5	LOS A	1.1	8.2	0.46	0.00	51.7
9	R	17	0.0	0.127	9.3	LOS A	1.1	8.2	0.46	1.00	49.0
Approach		228	2.7	0.127	2.2	LOS A	1.1	8.2	0.46	0.08	51.5
West: York St (west)											
10	L	127	0.0	0.178	9.0	LOS A	0.8	5.6	0.40	0.67	42.2
11	T	1	0.0	0.175	6.9	LOS A	0.8	5.6	0.40	0.66	42.4
12	R	35	0.0	0.178	9.3	LOS A	0.8	5.6	0.40	0.82	42.1
Approach		163	0.0	0.179	9.1	LOS A	0.8	5.6	0.40	0.70	42.2
All Vehicles		738	1.9	0.179	3.8	NA	1.1	8.2	0.38	0.26	49.3

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Future Sunday PM Peak (Oct10)

Remembrance Dr & Myrtle Cr Dr & York St Giveway Intersection
Future Sunday PM Peak (Oct 10)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: Remembrance Dr (south)											
1	L	44	0.0	0.126	8.4	LOS A	0.8	6.0	0.40	0.59	48.5
2	T	182	3.0	0.126	0.9	LOS A	0.8	6.0	0.40	0.00	52.4
3	R	9	0.0	0.126	8.7	LOS A	0.8	6.0	0.40	0.93	48.5
Approach		236	2.3	0.126	2.6	LOS A	0.8	6.0	0.40	0.15	51.5
East: Myrtle Cr Dr (east)											
4	L	14	0.0	0.026	9.2	LOS A	0.1	0.7	0.40	0.63	42.1
5	T	2	0.0	0.026	7.2	LOS A	0.1	0.7	0.40	0.61	42.3
6	R	5	0.0	0.026	9.5	LOS A	0.1	0.7	0.40	0.76	41.9
Approach		21	0.0	0.026	9.1	LOS A	0.1	0.7	0.40	0.66	42.0
North: Remembrance Dr (north)											
7	L	6	0.0	0.180	8.6	LOS A	1.6	11.7	0.41	0.65	48.9
8	T	313	3.0	0.182	1.1	LOS A	1.6	11.7	0.41	0.00	52.6
9	R	18	0.0	0.183	8.9	LOS A	1.6	11.7	0.41	1.01	48.9
Approach		337	2.8	0.182	1.7	LOS A	1.6	11.7	0.41	0.07	52.3
West: York St (west)											
10	L	46	0.0	0.112	9.5	LOS A	0.5	3.4	0.37	0.62	41.8
11	T	8	0.0	0.112	7.5	LOS A	0.5	3.4	0.37	0.64	42.0
12	R	33	0.0	0.113	9.8	LOS A	0.5	3.4	0.37	0.80	41.6
Approach		87	0.0	0.112	9.4	LOS A	0.5	3.4	0.37	0.69	41.8
All Vehicles		681	2.2	0.182	3.2	NA	1.6	11.7	0.40	0.19	50.0

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Existing Weekday AM Peak

River Rd & Moorland Rd Giveway Intersection
Existing Weekday AM Peak (8am - 9am)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	2	0.0	0.006	6.5	LOS A	0.0	0.2	0.08	0.55	43.0
3	R	5	0.0	0.006	6.9	LOS A	0.0	0.2	0.08	0.63	42.7
Approach		7	0.0	0.006	6.8	LOS A	0.0	0.2	0.08	0.61	42.8
East: River Rd (east)											
4	L	1	0.0	0.008	6.4	LOS A	0.0	0.0	0.00	0.89	43.3
5	T	15	0.0	0.008	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		16	0.0	0.008	0.4	LOS A	0.0	0.0	0.00	0.06	49.5
West: Moorland Rd (west)											
11	T	25	0.0	0.014	0.0	LOS A	0.1	0.5	0.06	0.00	49.3
12	R	2	0.0	0.014	6.8	LOS A	0.1	0.5	0.06	0.95	43.0
Approach		27	0.0	0.014	0.6	LOS A	0.1	0.5	0.06	0.07	48.7
All Vehicles		51	0.0	0.014	1.4	NA	0.1	0.5	0.04	0.15	48.0

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing Weekday PM Peak

River Rd & Moorland Rd Giveway Intersection
Existing Weekday PM Peak (4pm - 5pm)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	5	0.0	0.006	6.5	LOS A	0.0	0.2	0.08	0.57	43.0
3	R	2	0.0	0.006	6.9	LOS A	0.0	0.2	0.08	0.65	42.7
Approach		7	0.0	0.006	6.6	LOS A	0.0	0.2	0.08	0.59	42.9
East: River Rd (east)											
4	L	5	0.0	0.015	6.4	LOS A	0.0	0.0	0.00	0.84	43.3
5	T	23	0.0	0.015	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		28	0.0	0.015	1.2	LOS A	0.0	0.0	0.00	0.16	48.6
West: Moorland Rd (west)											
11	T	27	0.0	0.018	0.1	LOS A	0.1	0.6	0.08	0.00	48.9
12	R	6	0.0	0.018	6.8	LOS A	0.1	0.6	0.08	0.88	42.9
Approach		34	0.0	0.018	1.3	LOS A	0.1	0.6	0.08	0.16	47.7
All Vehicles		69	0.0	0.018	1.8	NA	0.1	0.6	0.05	0.21	47.5

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

River Rd & Moorland Rd Giveway Intersection
Existing Saturday AM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	2	0.0	0.006	6.5	LOS A	0.0	0.2	0.07	0.56	43.0
3	R	5	0.0	0.006	6.9	LOS A	0.0	0.2	0.07	0.63	42.7
Approach		7	0.0	0.006	6.8	LOS A	0.0	0.2	0.07	0.61	42.8
East: River Rd (east)											
4	L	1	0.0	0.006	6.4	LOS A	0.0	0.0	0.00	0.88	43.3
5	T	12	0.0	0.007	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		13	0.0	0.007	0.5	LOS A	0.0	0.0	0.00	0.07	49.4
West: Moorland Rd (west)											
11	T	19	0.0	0.011	0.0	LOS A	0.1	0.4	0.05	0.00	49.3
12	R	2	0.0	0.011	6.8	LOS A	0.1	0.4	0.05	0.94	43.0
Approach		21	0.0	0.011	0.7	LOS A	0.1	0.4	0.05	0.09	48.6
All Vehicles		41	0.0	0.011	1.7	NA	0.1	0.4	0.04	0.18	47.7

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

SIDRA INTERSECTION

MOVEMENT SUMMARY

Site: Existing Sunday PM Peak

River Rd & Moorland Rd Giveway Intersection
Existing Sunday PM Peak
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	3	0.0	0.004	6.5	LOS A	0.0	0.1	0.07	0.57	43.1
3	R	2	0.0	0.004	6.8	LOS A	0.0	0.1	0.07	0.64	42.8
Approach		5	0.0	0.004	6.6	LOS A	0.0	0.1	0.07	0.60	42.9
East: River Rd (east)											
4	L	3	0.0	0.009	6.4	LOS A	0.0	0.0	0.00	0.84	43.3
5	T	15	0.0	0.009	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		18	0.0	0.009	1.1	LOS A	0.0	0.0	0.00	0.15	48.7
West: Moorland Rd (west)											
11	T	17	0.0	0.011	0.0	LOS A	0.1	0.4	0.06	0.00	49.2
12	R	4	0.0	0.011	6.8	LOS A	0.1	0.4	0.06	0.88	42.9
Approach		21	0.0	0.011	1.4	LOS A	0.1	0.4	0.06	0.18	47.8
All Vehicles		44	0.0	0.011	1.9	NA	0.1	0.4	0.04	0.22	47.5

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Future Weekday AM Peak (Oct10)

River Rd & Moorland Rd Giveway Intersection
Future Weekday AM Peak (Oct 10)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	25	0.0	0.071	6.6	LOS A	0.3	2.3	0.10	0.55	42.9
3	R	60	0.0	0.071	6.9	LOS A	0.3	2.3	0.10	0.63	42.6
Approach		85	0.0	0.071	6.8	LOS A	0.3	2.3	0.10	0.61	42.7
East: River Rd (east)											
4	L	15	0.0	0.015	6.4	LOS A	0.0	0.0	0.00	0.73	43.3
5	T	15	0.0	0.015	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		29	0.0	0.015	3.2	LOS A	0.0	0.0	0.00	0.37	46.4
West: Moorland Rd (west)											
11	T	25	0.0	0.017	0.1	LOS A	0.1	0.6	0.08	0.00	48.9
12	R	7	0.0	0.017	6.8	LOS A	0.1	0.6	0.08	0.86	42.9
Approach		33	0.0	0.017	1.6	LOS A	0.1	0.6	0.08	0.19	47.4
All Vehicles		147	0.0	0.071	5.0	NA	0.3	2.3	0.08	0.47	44.4

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Future Weekday PM Peak (Oct10)

River Rd & Moorland Rd Giveway Intersection
Future Weekday PM Peak (Oct 10)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	14	0.0	0.031	6.7	LOS A	0.1	1.0	0.15	0.55	42.7
3	R	23	0.0	0.031	7.1	LOS A	0.1	1.0	0.15	0.63	42.5
Approach		37	0.0	0.031	7.0	LOS A	0.1	1.0	0.15	0.60	42.6
East: River Rd (east)											
4	L	53	0.0	0.040	6.4	LOS A	0.0	0.0	0.00	0.68	43.3
5	T	23	0.0	0.040	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		76	0.0	0.040	4.5	LOS A	0.0	0.0	0.00	0.47	45.1
West: Moorland Rd (west)											
11	T	27	0.0	0.029	0.2	LOS A	0.2	1.1	0.14	0.00	47.9
12	R	26	0.0	0.029	6.9	LOS A	0.2	1.1	0.14	0.73	42.7
Approach		54	0.0	0.029	3.5	LOS A	0.2	1.1	0.14	0.36	45.2
All Vehicles		166	0.0	0.040	4.7	NA	0.2	1.1	0.08	0.46	44.6

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Future Saturday AM Peak (Oct10)

River Rd & Moorland Rd Giveway Intersection
Future Saturday AM Peak (Oct 10)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	41	0.0	0.069	6.6	LOS A	0.3	2.2	0.10	0.56	42.9
3	R	44	0.0	0.069	7.0	LOS A	0.3	2.2	0.10	0.64	42.7
Approach		85	0.0	0.069	6.8	LOS A	0.3	2.2	0.10	0.60	42.8
East: River Rd (east)											
4	L	31	0.0	0.022	6.4	LOS A	0.0	0.0	0.00	0.67	43.3
5	T	12	0.0	0.022	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		42	0.0	0.022	4.6	LOS A	0.0	0.0	0.00	0.49	45.0
West: Moorland Rd (west)											
11	T	19	0.0	0.028	0.1	LOS A	0.1	1.0	0.10	0.00	48.4
12	R	32	0.0	0.028	6.8	LOS A	0.1	1.0	0.10	0.70	42.8
Approach		51	0.0	0.028	4.3	LOS A	0.1	1.0	0.10	0.44	44.7
All Vehicles		178	0.0	0.069	5.6	NA	0.3	2.2	0.08	0.53	43.8

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.

MOVEMENT SUMMARY

Site: Future Sunday PM Peak (Oct10)

River Rd & Moorland Rd Giveway Intersection
Future Sunday PM Peak (Oct 10)
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	Turn	Demand Flow veh/h	HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back of Queue Vehicles veh	95% Back of Queue Distance m	Prop. Queued	Effective Stop Rate per veh	Average Speed km/h
South: River Rd (south)											
1	L	42	0.0	0.068	6.6	LOS A	0.3	2.2	0.11	0.56	42.9
3	R	42	0.0	0.068	7.0	LOS A	0.3	2.2	0.11	0.64	42.6
Approach		84	0.0	0.068	6.8	LOS A	0.3	2.2	0.11	0.60	42.8
East: River Rd (east)											
4	L	33	0.0	0.025	6.4	LOS A	0.0	0.0	0.00	0.68	43.3
5	T	15	0.0	0.025	0.0	LOS A	0.0	0.0	0.00	0.00	50.0
Approach		47	0.0	0.025	4.4	LOS A	0.0	0.0	0.00	0.47	45.2
West: Moorland Rd (west)											
11	T	17	0.0	0.027	0.1	LOS A	0.1	1.0	0.11	0.00	48.3
12	R	33	0.0	0.027	6.9	LOS A	0.1	1.0	0.11	0.69	42.7
Approach		49	0.0	0.027	4.6	LOS A	0.1	1.0	0.11	0.46	44.5
All Vehicles		181	0.0	0.068	5.6	NA	0.3	2.2	0.08	0.53	43.8

LOS (Aver. Int. Delay): NA. The average intersection delay is not a good LOS measure for two-way sign control due to zero delays associated with major road movements.
Level of Service (Worst Movement): LOS A. LOS Method for individual vehicle movements: Delay (RTA NSW).
Approach LOS values are based on the worst delay for any vehicle movement.