Our Ref: 17257

18 May 2018

Urbis
Tower 2, Level 23,
Darling Park
201 Sussex St,
Sydney NSW 2000

Attention: Mr Cameron Nixon

Dear Cameron,

RE: WALLACIA MEMORIAL PARK
RESPONSE TO ROADS AND MARITIME LETTER DATED 4TH APRIL 2018

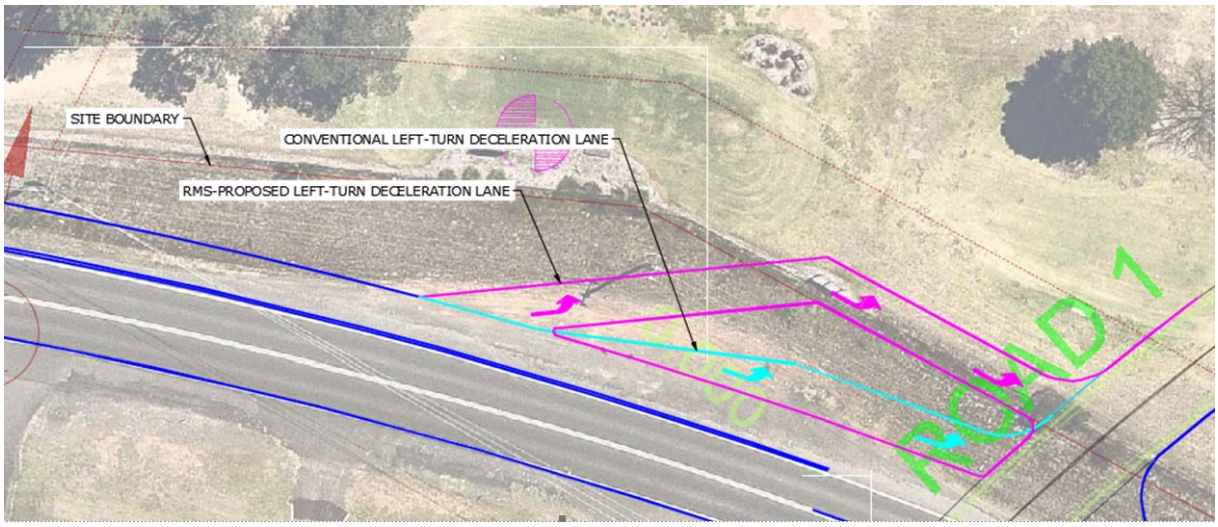
You will be aware that a letter was received from Roads and Maritime Services (Roads and Maritime) recently in relation to the above site. We have therefore responded to the points raised in their letter.

1. ***Roads and Maritime requests a Seagull intersection treatment to be provided for the main access to the site on Park Road. This would allow for a protected right turn into the site and a protected waiting area for vehicles turning right out of the site onto Park Road. Consideration should also be given to a left turn deceleration lane (within the property boundary) for eastbound traffic on Park Road into the site at the main access. The design and construction of the intersection should be in accordance with AUSTROADS and Roads and Maritime requirements and endorsed by a suitably qualified practitioner. The application including the plans should be amended reflecting the above requirement and a concept design should be provided to Roads and Maritime for review.***

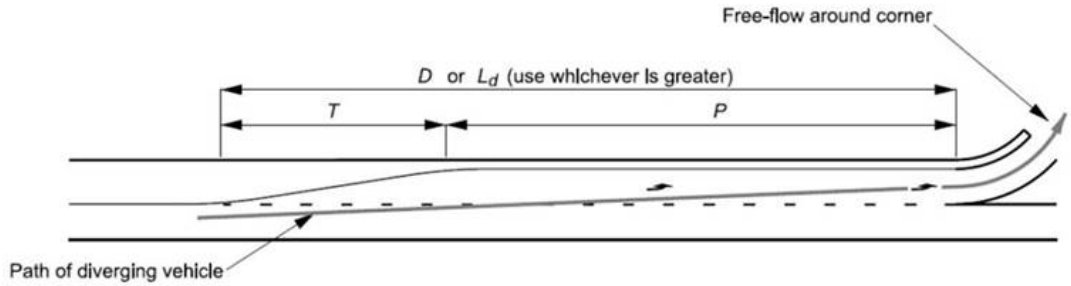
We had proposed a right turn treatment into the site which was, in principle, acceptable to Penrith Council. The intersection had sufficient capacity to accommodate the site traffic and we believed the required road widening/line marking was in keeping with its location. However, as requested by Roads and Maritime, the provision of a seagull intersection with its related central medians can be provided as shown in **Annexure A**.

We would suggest that such a layout might be reconsidered in terms of line marking as opposed to the solid medians shown as this would minimise the effect on the property accesses to the south of the access.

With regard to the deceleration lane, I do have some issues with the suggestion of a left turn deceleration lane within the property boundary.



A deceleration lane by definition is an additional lane added to the through carriageway for safety and/or intersection capacity purposes. It is a means for the turning traffic to move into an adjacent lane to negotiate an intersection without interfering with the through traffic. This is as shown in light blue above.



(b) Deceleration to a turning speed

If you provide the deceleration lane wholly within the client land. It will be above 10m away from the adjacent traffic lanes. As such it would be necessary for traffic to cross into the adjacent land by means of a service road (which have shown in purple) before getting to a short lane within the site. This traffic would then have to give way to traffic on the access road. It is my view that in this arrangement was provided, traffic would simply avoid the slip lane and travel to the intersection where they would undertake a left turn. The provision of a traditional left turn deceleration lane is a much better option.

Consequently, whilst Roads and Maritime has asked TTPP to consider the provision of a deceleration lane, we would propose a traditional turn lane as shown in blue (and as shown on the proposed layout shown in **Annexure A**).

2. ***Clarification is required regarding the overall future operation of the golf club house and the anticipated additional traffic at the existing access to the golf club as a result of the development. It is indicated the club house will be used for functions following a funeral at the proposed new chapel. However, it seems the club house will also continue operating as a golf course. The reports do not identify the full capacity of the club house and neglects to address the parking requirement and the required access arrangements to/from Park Road. The traffic report advises a considerable number of chapel / cemetery visitors will leave the site via the club house (rather than the new main entry) having attended a function following the funeral. However, this is not reflected in the report and Sidra modelling. The existing 61 parking spaces surrounding the club house appear random and it seems access can be gained to and from adjoining properties. The above matters need to be addressed and the parking and access to the club house needs to be assessed and formalised as a result of the development.***

The clubhouse can presently be used as a function centre. It is noted that the Golf Club already operates its Wallacia Function Room for "reunions, birthday parties, engagement parties, weddings, anniversaries, christenings as well as wakes" and the 61 spaces provided for the club and function centre is adequate for its purpose.

The plans proposed by CMCT will see this retained with the potential for wakes to be held within the clubhouse. The operations of the golf course itself will continue however with a slight reduction as a result of the number of holes being reduced to 13 from 18.

Clearly, however not all functions will take place at the Wallacia club, many will occur in other locations at residential properties. The Trust inform me that at other cemeteries only 10-15% of people have functions at the cemetery although they expect this may be up to 20% at the subject site.

There is only one function room at the centre and if there is a function after the service, it would simply be a use of the existing function room which could occur as at present. It would be likely that a wake would take place for a few hours (morning or afternoon) so the likelihood of concurrent functions from the cemetery would be extremely rare. However, it is noted that this situation could occur at the club in its current use.

The traffic report was incorrect in stating that a considerable number of chapel / cemetery visitors will leave the site via the club house – all exit from the Cemetery and chapel is via the new access.

Even if such overlap did occur, we have identified that the parking demand for the chapel is 40 vehicles, so we have considered a case when all 40 of these vehicles went to the Golf Club with these vehicles undertaking a right turn in with 40 leaving vehicles from the previous service undertaking a right turn out to replicate an unlikely and very conservative scenario. The modelling shown at Annexure B confirms that the existing simple tee intersection will be able to accommodate this traffic, so the form of access is adequate.

3. ***It is proposed to provide a 'one-way' internal road which links the golf club to Mulgoa Road. However, no information is provided regarding proposed access arrangement and intersection analysis at this access point on Mulgoa Road. This information is also required.***

This issue was also noted at the public consultation meetings that took place earlier this year and as a result the one-way internal road has been removed from the scheme.

4. ***Overall parking on site is based on the operational requirements of the Catholic Cemeteries. Allocations for parking are based on 1 ceremony at a time, however on occasion there may be an overlap of patrons turning up and looking for parking while another ceremony is finishing. The report refers to the additional existing 61 spaces at the clubhouse, but some of these spaces will be occupied by members of the golf club. It is stated that visitors using the function rooms following a funeral ceremony may leave their car parked at the chapel to reduce the demand on parking associated with the function centre. However, this is a considerable walk and vehicles left at the chapel would restrict the access for parking if additional services taking place later. Additional information is required addressing the above concerns and how parking is managed especially when there are overlapping ceremonies.***

If one examines the "upcoming services" at a number of memorial park websites, it is clear that the services are offset in order that the chapel can be cleaned, flowers can be arranged, coffins can be offloaded from hearses (e.g. two hearses are rarely seen at the same time at a chapel) and consequently the instance of patrons turning up and looking for parking while another ceremony is finishing is limited.

Even though I don't believe this would occur to any great extent, it is noted that, as at most cemeteries, kerbside parking is provided along the internal road network to allow people to park next to the grave/memorial stone as opposed parking being provided in a central car park and people having to walk to the grave/memorial stone. The subject proposal is providing roads of a width suitable to allow parking to occur alongside the road so if there was a short period when the car park area at the chapel was full, people could park adjacent to the roads.

5. ***It is noted from the traffic report that the Safe Intersection Sight Distance (SISD) has been estimated based on the 60 km/h and 80 km/h speed limit on Park Road. Roads and Maritime requests the SISD to be provided based on the design speed of 70km/h and 80km/h (10 km/h) higher than the posted speed limit) as per AUSTROADS and submitted for review.***

The SISD has now provided in accordance with Roads and Maritime's suggestion, that is 10km/h above the posted speed limit.

6. ***All other redundant driveway(s) on Park Road and Mulgoa Road should be removed as a result of the proposed development. This should be shown on the plans.***

All redundant driveway(s) on Park Road and Mulgoa Road will be removed and the development plan will be updated to reflect this.

7. ***Roads and Maritime requests Sidra analysis files for all intersections analysed to be submitted for review and assessment.***

SIDRA files will be issued to development.sydney@rms.nsw.gov.au

8. ***The reports refer to Park Road as local road. It is advised that Park Road is a classified road; therefore, the proposed access arrangement and road works on Park Road requires concurrence from Roads and Maritime under Section 138 of the Roads Act 1993.***

This has been noted.

Finally, Roads and Maritime also made the following comments.

Furthermore, Roads and Maritime has previously acquired a strip of land for road along the Mulgoa Road frontage of the subject property, as shown by blue colour on the attached Aerial –"Z". Roads and Maritime has also previously resumed and dedicated a strip of land as road along the Park Road frontage of the subject property, as shown by grey colour on the attached Aerial – "X", "Y" and "Z". The subject property is further affected by a Road Widening Order under Section 25 of the Roads Act, 1993 as published in Government Gazette No. 112 of 20th October 1967; folio 3854, as shown by pink colour on the attached Aerial –"X" and "Y" and DP 227202. Therefore, any new buildings or structures, together with any improvements integral to the future use of the site are to be wholly within the property boundaries and erected clear of the land reserved for road widening (unlimited in height or depth). The area required for road should be identified on any plan of development.


PARK RD
MONTELIMAR PL
PARK RD
40 PARK ROAD WALLACIA
1 DP1108408
2 DP1108408
9 DP238697
10 DP238697
11 DP238697
1 DP238697
3 DP837578
513 DP789716
512 DP789716
503 DP789716
502 DP789716
501 DP789716
501 DP789716
A DP339050
1 DP575367
37 DP850418
E DP404562

We can confirm that the land which is subject to the road widening order as highlighted in pink in the plan below will be identified on the masterplan and no buildings/structures will be located in this area.

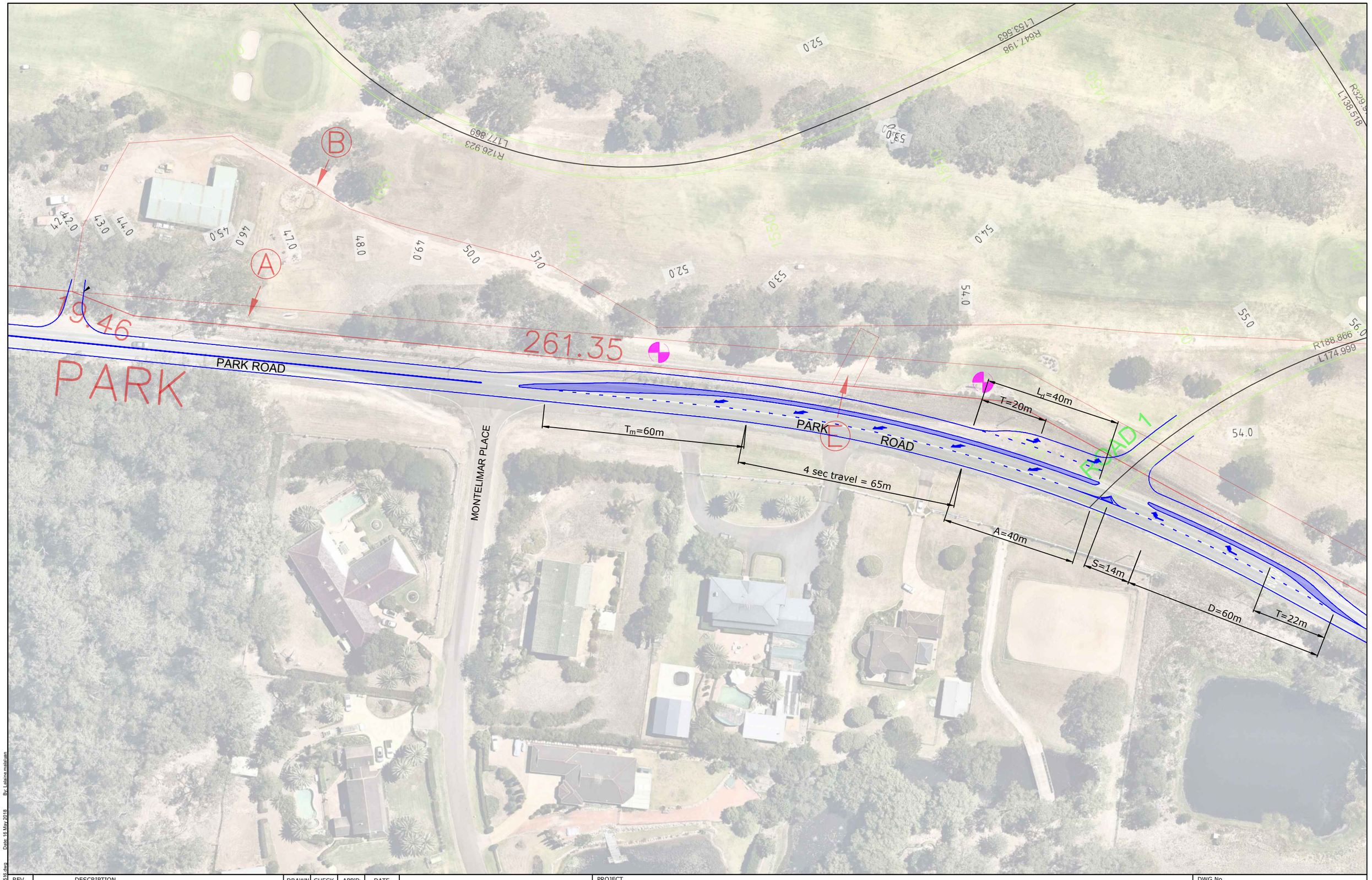
We trust the above is to your satisfaction. Should you have any queries regarding the above or require further information, please do not hesitate to contact the undersigned on 8437 7800.

Yours sincerely,

Ken Hollyoak
Director

Annexure One

Proposed Seagull Arrnagement



REV.	DESCRIPTION	DRAWN	CHECK	APP'D	DATE
A	ISSUE FOR DISCUSSION	LM	KH	KH	10/04/18

The Transport Planning Partnership

Suite 402, 22 Atchison Street
St. Leonards NSW 2065
Tel: 02 8437 7800
Email: info@ttpp.net.au

PROJECT: PARK ROAD CEMETERY, WALLACIA

TITLE: SEAGULL INTERSECTION CONCEPT DESIGN

DWG No.: FIGURE 1

DATE STAMP: 16 MAY 2018

PROJECT No.: 17257

SCALE: 1:1000 @A3

REV.: A

Filename: 17257CADD\Seagull-180516.dwg Date: 16 May 2018 By: Lalaine.maliluan

Annexure Two

Amended Golf Club Access Traffic Model

MOVEMENT SUMMARY

Site: 101 [PROPAM_ Panthers / Park Road]

Network: N101 [Fu AM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Access													
1	L2	1	0.0	1	0.0	0.005	6.0	LOS A	0.0	0.1	0.38	0.59	47.6
2	T1	1	0.0	1	0.0	0.005	8.0	LOS A	0.0	0.1	0.38	0.59	51.9
3	R2	1	0.0	1	0.0	0.005	10.1	LOS A	0.0	0.1	0.38	0.59	47.6
Approach		3	0.0	3	0.0	0.005	8.0	LOS A	0.0	0.1	0.38	0.59	49.6
East: Park Road (East)													
4	L2	1	0.0	1	0.0	0.131	7.7	LOS A	0.5	3.9	0.32	0.19	55.6
5	T1	148	19.9	148	19.9	0.131	0.9	LOS A	0.5	3.9	0.32	0.19	54.5
6	R2	54	0.0	54	0.0	0.131	7.6	LOS A	0.5	3.9	0.32	0.19	55.2
Approach		203	14.5	203	14.5	0.131	2.7	NA	0.5	3.9	0.32	0.19	54.8
North: Panthers Gold Club													
7	L2	1	0.0	1	0.0	0.091	7.4	LOS A	0.3	2.1	0.58	0.83	44.6
8	T1	1	0.0	1	0.0	0.091	8.4	LOS A	0.3	2.1	0.58	0.83	50.1
9	R2	43	0.0	43	0.0	0.091	10.7	LOS A	0.3	2.1	0.58	0.83	44.6
Approach		45	0.0	45	0.0	0.091	10.6	LOS A	0.3	2.1	0.58	0.83	44.9
West: Park Road (west)													
10	L2	11	0.0	11	0.0	0.246	5.6	LOS A	0.0	0.1	0.00	0.01	57.1
11	T1	465	6.6	465	6.6	0.246	0.0	LOS A	0.0	0.1	0.00	0.01	58.7
12	R2	1	0.0	1	0.0	0.246	6.1	LOS A	0.0	0.1	0.00	0.01	56.4
Approach		477	6.4	477	6.4	0.246	0.1	NA	0.0	0.1	0.00	0.01	58.5
All Vehicles		728	8.2	728	8.2	0.246	1.5	NA	0.5	3.9	0.13	0.12	54.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPPM_ Panthers / Park Road]

Network: N101 [Fu PM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Access													
1	L2	1	0.0	1	0.0	0.005	6.8	LOS A	0.0	0.1	0.50	0.63	47.1
2	T1	1	0.0	1	0.0	0.005	8.1	LOS A	0.0	0.1	0.50	0.63	51.6
3	R2	1	0.0	1	0.0	0.005	10.4	LOS A	0.0	0.1	0.50	0.63	47.1
Approach		3	0.0	3	0.0	0.005	8.4	LOS A	0.0	0.1	0.50	0.63	49.3
East: Park Road (East)													
4	L2	1	0.0	1	0.0	0.236	6.7	LOS A	0.4	3.4	0.12	0.08	57.2
5	T1	374	12.4	374	12.4	0.236	0.2	LOS A	0.4	3.4	0.12	0.08	57.6
6	R2	51	0.0	51	0.0	0.236	6.6	LOS A	0.4	3.4	0.12	0.08	56.7
Approach		425	10.9	425	10.9	0.236	1.0	NA	0.4	3.4	0.12	0.08	57.4
North: Panthers Gold Club													
7	L2	9	0.0	9	0.0	0.131	6.4	LOS A	0.4	3.1	0.55	0.79	44.9
8	T1	1	0.0	1	0.0	0.131	8.6	LOS A	0.4	3.1	0.55	0.79	50.3
9	R2	59	0.0	59	0.0	0.131	11.0	LOS A	0.4	3.1	0.55	0.79	44.9
Approach		69	0.0	69	0.0	0.131	10.3	LOS A	0.4	3.1	0.55	0.79	45.0
West: Park Road (west)													
10	L2	5	0.0	5	0.0	0.139	5.9	LOS A	0.0	0.1	0.01	0.01	57.1
11	T1	254	12.0	254	12.0	0.139	0.0	LOS A	0.0	0.1	0.01	0.01	58.5
12	R2	1	0.0	1	0.0	0.139	7.1	LOS A	0.0	0.1	0.01	0.01	56.3
Approach		260	11.7	260	11.7	0.139	0.2	NA	0.0	0.1	0.01	0.01	58.3
All Vehicles		758	10.1	758	10.1	0.236	1.6	NA	0.4	3.4	0.12	0.12	55.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPSUN_ Panthers / Park Road]

Network: N101 [Fu SUN Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Garage Access													
1	L2	2	0.0	2	0.0	0.005	5.4	LOS A	0.0	0.1	0.45	0.59	24.2
2	T1	1	0.0	1	0.0	0.005	6.6	LOS A	0.0	0.1	0.45	0.59	48.7
3	R2	1	0.0	1	0.0	0.005	8.7	LOS A	0.0	0.1	0.45	0.59	24.2
Approach		4	0.0	4	0.0	0.005	6.5	LOS A	0.0	0.1	0.45	0.59	38.0
East: Park Road (East)													
4	L2	1	0.0	1	0.0	0.237	6.6	LOS A	0.8	5.5	0.20	0.13	53.0
5	T1	340	1.2	340	1.2	0.237	0.3	LOS A	0.8	5.5	0.20	0.13	56.2
6	R2	94	0.0	94	0.0	0.237	6.5	LOS A	0.8	5.5	0.20	0.13	56.1
Approach		435	1.0	435	1.0	0.237	1.7	NA	0.8	5.5	0.20	0.13	56.2
North: Panthers Gold Club													
7	L2	12	0.0	12	0.0	0.134	6.3	LOS A	0.5	3.2	0.52	0.77	45.4
8	T1	1	0.0	1	0.0	0.134	8.2	LOS A	0.5	3.2	0.52	0.77	44.6
9	R2	63	0.0	63	0.0	0.134	10.5	LOS A	0.5	3.2	0.52	0.77	45.4
Approach		76	0.0	76	0.0	0.134	9.9	LOS A	0.5	3.2	0.52	0.77	45.4
West: Park Road (west)													
10	L2	9	0.0	9	0.0	0.124	5.7	LOS A	0.0	0.1	0.01	0.03	57.0
11	T1	236	1.8	236	1.8	0.124	0.0	LOS A	0.0	0.1	0.01	0.03	57.7
12	R2	1	0.0	1	0.0	0.124	6.8	LOS A	0.0	0.1	0.01	0.03	46.6
Approach		246	1.7	246	1.7	0.124	0.3	NA	0.0	0.1	0.01	0.03	57.5
All Vehicles		761	1.1	761	1.1	0.237	2.1	NA	0.8	5.5	0.17	0.17	54.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

Wallacia Memorial Park, 13 Park Road
Transport Impact Assessment

Prepared for:

Catholic Metropolitan Cemeteries Trust

13 March 2018

The Transport Planning Partnership

Wallacia Memorial Park, 13 Park Road

Transport Impact Assessment

Client: Catholic Metropolitan Cemeteries

Trust Version: V02

Date: 13 March 2018

TTPP Reference: 17257

Quality Record

Version	Date	Prepared by	Reviewed by	Approved by	Signature
V01	26/10/2017	Rob Franklin	Ken Hollyoak	Ken Hollyoak	
V02 – Updated as per Council comments	13/03/2018	Jessica Szeto	Ken Hollyoak	Ken Hollyoak	

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E. SIDRA INTERSECTION MODEL OUTPUTS

1 Introduction

1.1 Background

This report relates to an assessment of the traffic and parking aspects of a proposed cemetery, located at 13 Park Road, Wallacia. The development application seeks to provide a cemetery, within the boundary of the existing site, with associated crematorium and function room facilities.

A development plan has been developed for the development proposal, with consideration given to access arrangements and internal road configurations.

The Transport Planning Partnership (TTPP) was commissioned by Catholic Metropolitan Cemeteries Trust (CMCT) to undertake a transport impact assessment (TIA) for the proposed development. The assessment will accompany a Development Application (DA) to Council, seeking approval for the proposed development.

This TIA has been updated to include additional traffic modelling at the Park Road / Greendale Road intersection, as requested by Council in their letter dated 23 February 2018. This has also given us the opportunity to model the intersections as a network due the proximity of the intersections.

1.2 Purpose of this Report

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

- existing transport conditions surrounding the site
- the traffic generating characteristics of the proposed development
- suitability of the proposed parking provision and access arrangements
- the transport impact of the development on the surrounding road network.

1.3 Reference

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

- AS2890.1 Off-street Car Parking
- AS2890.6 Off-Street Parking for People with Disabilities
- Austroads Guide to Traffic Design Part 4A: Unsignalised Intersections
- RMS Guide to Traffic Generating Developments, 2002.

2 Existing Transport Conditions

This section presents the existing transport conditions of the surrounding road network.

2.1 Site Location

The subject site is located at the existing Panthers Wallacia golf club. The site measures approximately 44ha in size and fronts onto Park Road. The approximate location of the site is shown in below in Figure 1.

Figure 1: Subject Site and Its Surrounding Environs

Basemap Source: Google Maps. Viewed Online: 20/09/17

2.2 Road Network

Access to the existing Panthers Wallacia golf club is permitted via Park Road, which provides also provides access onto Silverdale Road and Mulgoa Road within the immediate vicinity of the site.

Park Road is a local road under the jurisdiction of Penrith City Council and provides single lanes in east and west directions, with a posted speed limit of 60km/h. The majority of Park Road is marked with double continuous white lining, restricting vehicles to no overtaking. Some sections of Park Road do permit overtaking when broken white dividing lines and double white lines with a broken line are shown.

Silverdale Road is a local road under the jurisdiction of Penrith City Council and provides a route between Wallacia and Silverdale, with links to Warragamba via Warradale Road and Farnsworth Avenue. Silverdale Road has a posted speed limit of 60km/h and is marked by double continuous white lining. Silverdale Road meets Park Road and Mulgoa Road via a three-arm priority roundabout intersection, just west of the development site.

Mulgoa Road is located north-west of the development site and provides travel in north and south directions, via single lanes. Within proximity of the site, Mulgoa Lane has a school zone, resulting in a reduced speed limit of 40km/h for 380 metres, between the hours of 8am-9:30am and 2:30pm-4pm. Beyond this, the speed limit is increased to 60km/h.

2.3 Existing Traffic Volumes

Traffic surveys were undertaken on Thursday 7th and Sunday 10th September 2017 at the following intersections:

- Park Road / Silverdale Road / Mulgao Road – 3 Arm Priority Roundabout Intersection
- Panther Wallacia Gold Club House Entrance / Park Road – Priority access

In addition to this, traffic surveys were undertaken on Thursday 1st and Sunday 11th March 2018 at the Park Road and Greendale Road intersection, as requested by Council.

The survey days were selected as being the likely busiest weekday and weekend day as a result of TTPP having organised surveys on similar cemetery sites.

The existing peak traffic flows, for both the Thursday and Sunday surveys are shown in the figures below. All traffic flow diagrams can be found in Appendix A, with the recorded traffic survey data appended in Appendix B.

Figure 2: Existing AM Peak Traffic Flows – Thursday

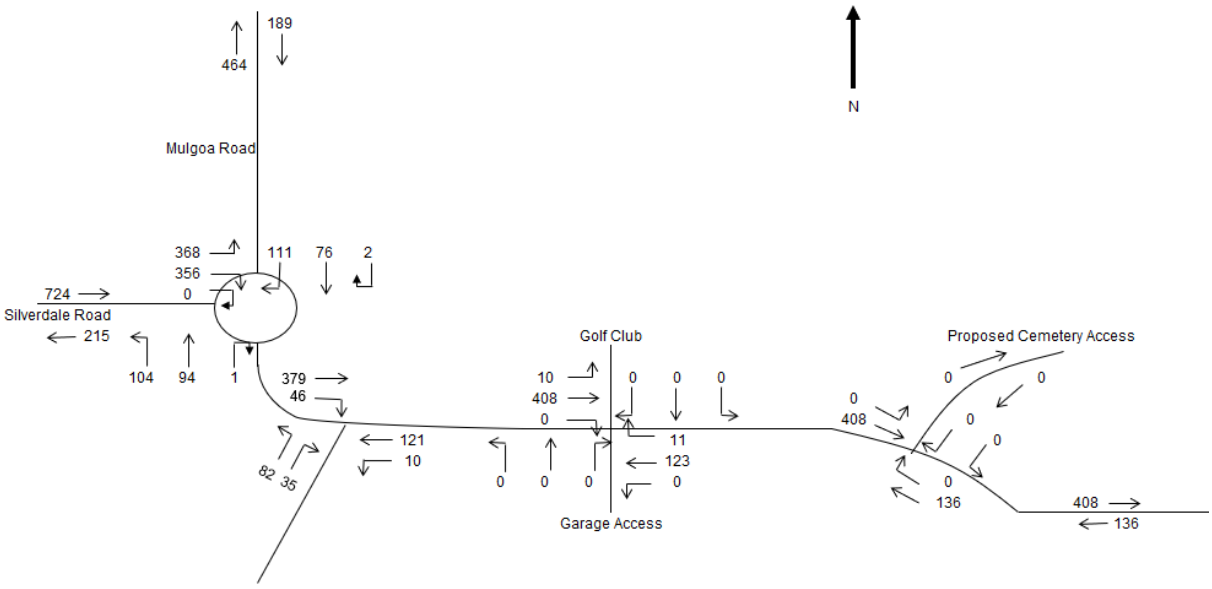


Figure 3: Existing PM Peak Traffic Flows – Thursday

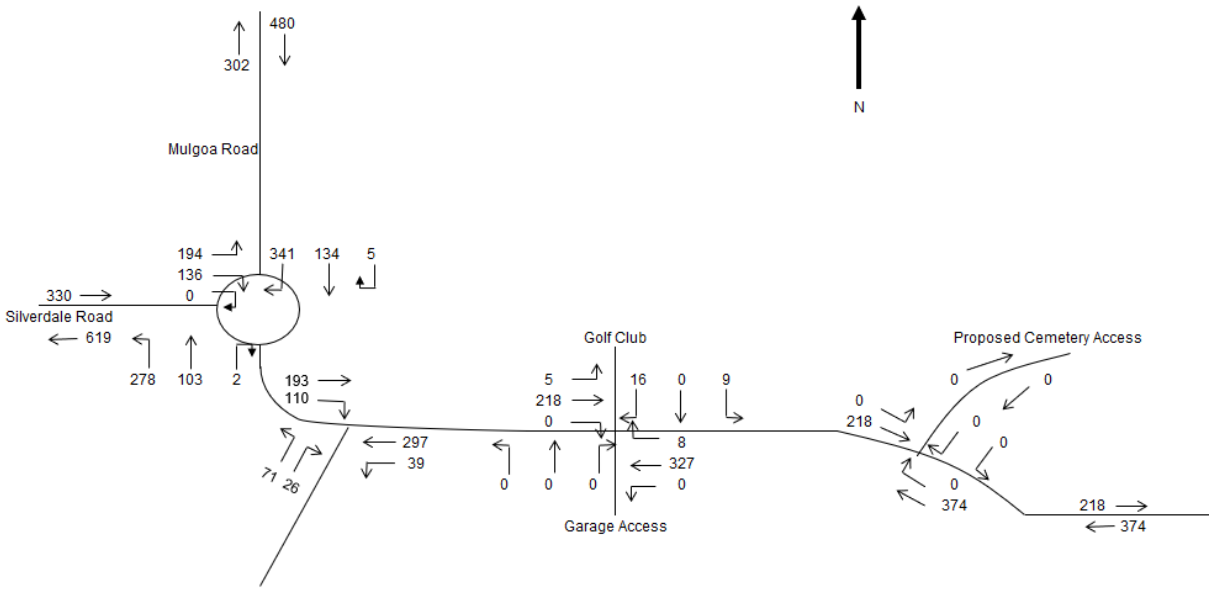
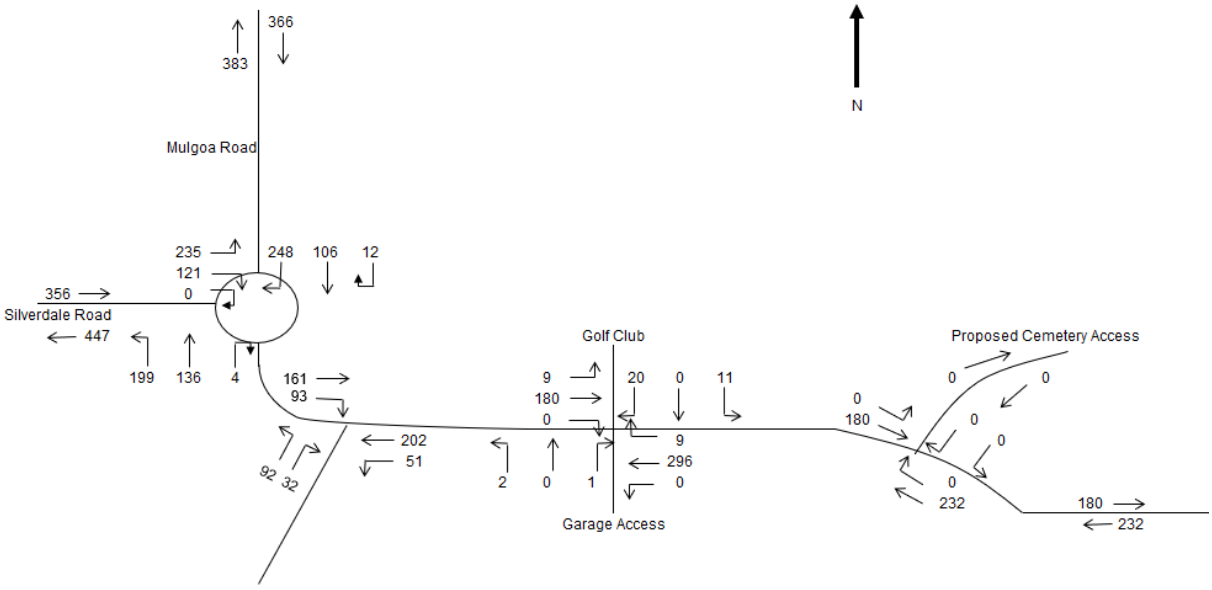


Figure 4: Existing Weekend Peak Traffic Flows – Sunday



2.4 Public Transport Services

The subject site is situated approximately 145 metres from northbound bus services and approximately 185 metres from southbound and eastbound services, located on Mulgoa Road. Bus service 795 is the only service which stops at these bus stops and provides travel between McCarthy High School, Emu Plains and Weir Road at Ninth Street, Warragamba. A timetable of the 795 services, from Penrith to Warragamba, is shown below.

Figure 5: 795 Bus Service – Penrith to Warragamba

Monday to Friday										
Service Information	69									
McCarthy High School, Emu Plains	-	-	-	-	-	-	15:42	-	-	-
Gascoigne St near Brell Pl, Kingswood	-	-	-	-	-	15:18	–	-	-	-
Penrith Temporary Interchange - Stand C, Penrith	06:27	07:24	08:28	09:47	14:09	15:32	15:51	16:33	17:57	18:57
Station St at Jamison Rd, Penrith	06:30	07:28	08:32	09:52	14:14	15:37	15:56	16:38	18:02	19:01
Nepean Shores Resort Tench Av, Jamisontown	–	–	–	09:56	14:18	–	16:00	–	–	–
Regentville Auto Mulgoa Rd near Spencer St, Regentville	06:35	07:33	08:37	10:01	14:23	15:44	16:06	16:45	18:07	19:05
Nepean District Christian School, Mulgoa	–	–	08:45	–	–	–	–	–	–	–
Mulgoa Public School Mulgoa Rd, Mulgoa	106 06:43	106 07:41	08:51	10:08	14:32	15:53	16:13	16:52	18:14	19:12
Davenport Dr before Kadiera Cl, Wallacia	–	–	08:58	10:15	14:40	16:01	16:21	17:00	18:21	19:19
Silverdale Rural Fire Brigade, Marsh Rd, Silverdale	–	106 07:53	09:10	10:27	14:55	16:16	16:35	17:13	18:34	19:32
Weir Rd at Ninth St, Warragamba	137 06:57	08:00	09:17	10:34	15:03	16:24	16:43	17:21	18:42	19:40

Saturday				
Penrith Temporary Interchange - Stand C, Penrith	09:47	13:47	15:47	18:47
Station St at Jamison Rd, Penrith	09:52	13:52	15:52	18:52
Nepean Shores Resort Tench Av, Jamisontown	–	13:55	15:55	18:55
Regentville Auto Mulgoa Rd near Spencer St, Regentville	09:56	14:00	16:00	19:00
Mulgoa Public School Mulgoa Rd, Mulgoa	106 10:04	14:08	16:08	19:08
Davenport Dr before Kadiera Cl, Wallacia	–	14:16	16:16	19:16
Silverdale Rural Fire Brigade, Marsh Rd, Silverdale	–	14:28	16:28	19:28
Weir Rd at Ninth St, Warragamba	137 10:19	14:35	16:35	19:35

Sunday & Public Holidays		
Penrith Temporary Interchange - Stand C, Penrith	10:10	16:10
Station St at Jamison Rd, Penrith	10:14	16:14
Nepean Shores Resort Tench Av, Jamisontown	–	16:17
Regentville Auto Mulgoa Rd near Spencer St, Regentville	10:19	16:23
Mulgoa Public School Mulgoa Rd, Mulgoa	106 10:27	16:31
Davenport Dr before Kadiera Cl, Wallacia	–	16:40
Silverdale Rural Fire Brigade, Marsh Rd, Silverdale	–	16:51
Weir Rd at Ninth St, Warragamba	137 10:41	16:58

Source: Transport for NSW Website: Viewed online: 20/09/17

There are no additional public transport links within the vicinity of the site.

2.5 Pedestrian and Cyclists Facilities

Footpaths are present within the vicinity of the site on both sides of Park Road, however, footpath provision is not available east of the Panther Wallacia golf club access. Footpaths continue northbound on Mulgoa Road providing access to amenities and dwellings on both sides of the road. Limited footpath provision is available on Silverdale Road, with paths extending west as far as the residential dwellings.

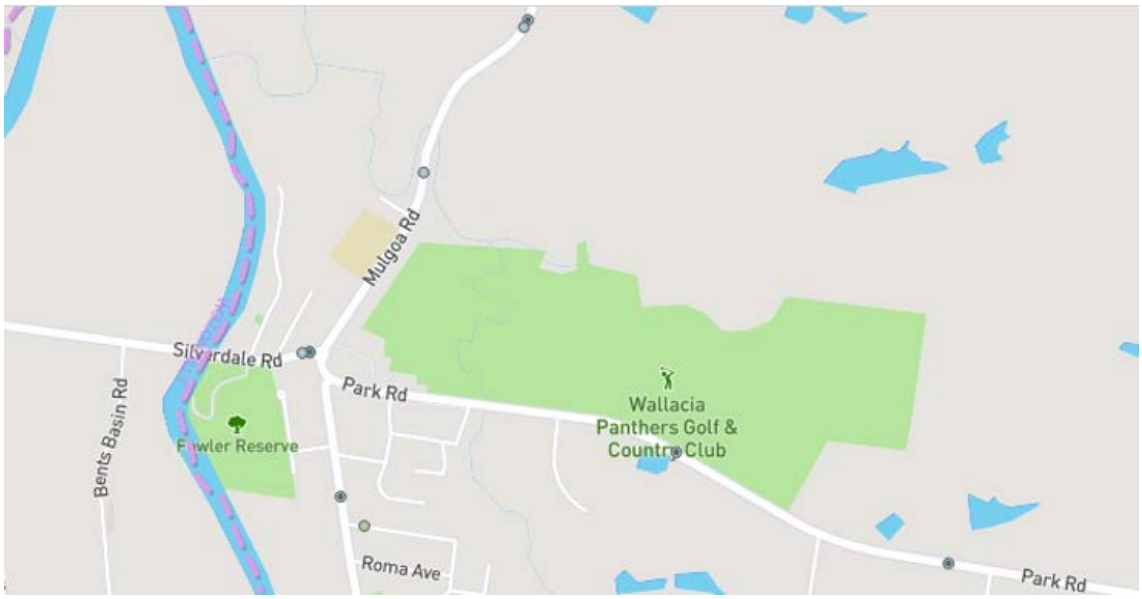
A number of crossing facilities are also present within the area, with pedestrian refuge islands present on Park Road and Mulgoa Road. A pedestrian zebra crossing is also present on Mulgoa Road.

There are no formal cycle routes within the immediate vicinity of the development site. The closest cycle route is located approximately 4.5km east of the golf club on The Old Northern Road. The RMS cycleway finder classifies this route as 'high difficulty' and the route extends to South Penrith to the north and Narellan to the south.

2.6 Road Safety Review

TTPP has obtained RMS vehicle crash data and the accident reports have been utilised to determine any vehicle accidents, within a 1km driving distance of the site. The crash and casualty reports identified the frequency and contributory causes of crashes around the site, within the past 5 years. The location of the recorded vehicle accidents, within a 1km driving distance of the site, are shown below.

Figure 6: Location of Vehicle Accidents



Source: RMS 'Crash and Casualty Statistics' Online Viewer (viewed online: September 2017)

The RMS crash data and reports note that there were 9 vehicle accidents, within a 1km driving distance of the site, between 1st January 2012 and 31st December 2016.

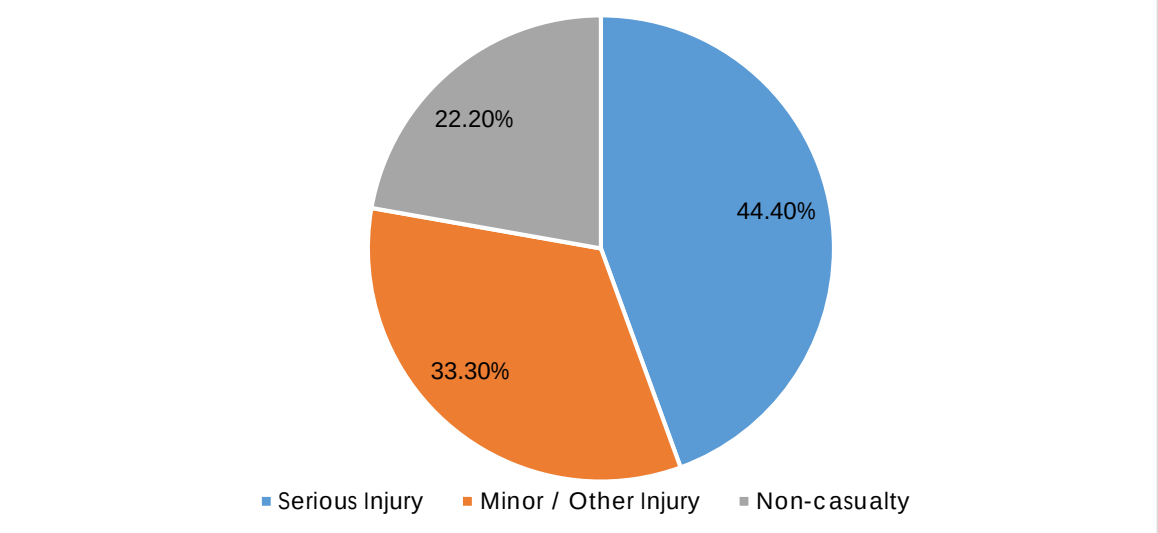
The RMS crash data reports demonstrate the degree of vehicle accidents, which include:

- Non-Casualty (Towaway)
- Minor / Other Injury
- Moderate Injury
- Serious Injury
- Fatal

Of the 9 recorded accidents, 44% of accidents (4 total) were noted to result in serious injuries. 33% of accidents (3 total) were noted to result in minor or other injury with the remaining 22% (2 total) being identified as non-casualty (towaway).

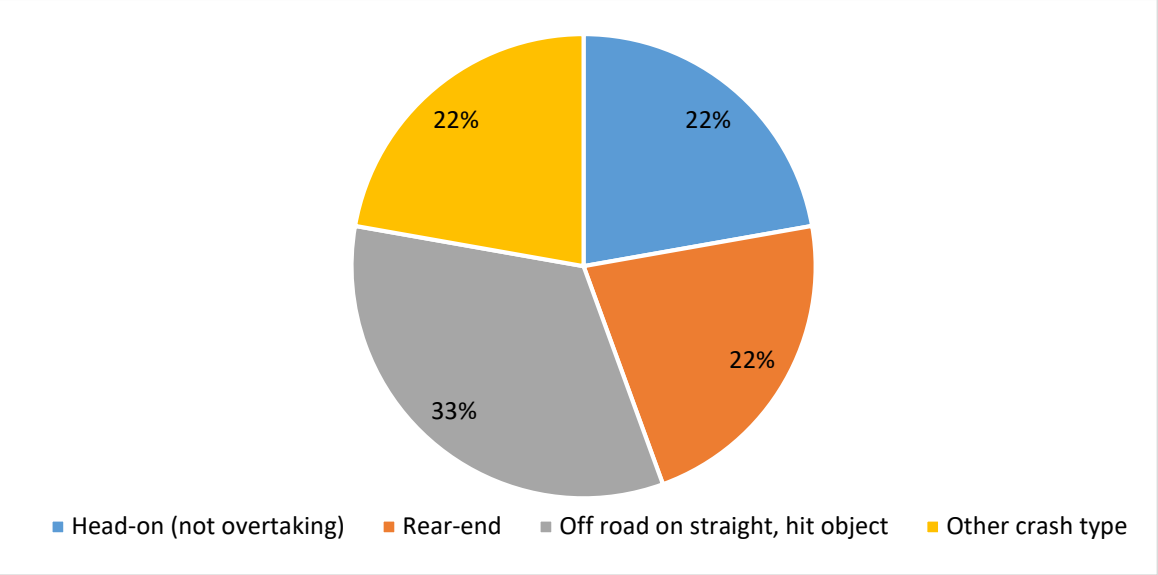
It was recorded that there were no fatal or moderate injury accidents. The severity of recorded accidents is shown in Figure 7.

Figure 7: Accident Severity



Of the recorded vehicle accidents, it was reported that the most common cause (33% of all accidents) was vehicles travelling off the road, on a stretch of straight road and hitting an object. Head on collisions, rear-ended shunts and other crash types were all recorded as the remaining accident factors. The percentage of accident types discussed, are shown in the figure below.

Figure 8: Accident Type



There does not appear to be any location where there is a significant cluster of crashes. The full RMS crash data and report can be found in Appendix C.

2.7 Journey to Work Data

Table 1 provides a summary of the Bureau of Transport Statistics (BTS) Journey to Work (JTW) data, for area 4969.

Table 1: Existing Mode Share to and from Wallacia (Travel Zone 4969)

Trips	Train	Bus	Car (Driver and Passenger)	Walked Only	Other	Total
Residents outbound work trips to other destinations	3%	1%	91%	2%	3%	100%
Workers inbound work trips from other destinations	2%	NA	88%	6%	4%	100%

Source: Bureau of Transport Statistics (BTS) Journey to Work (JTW) data. Viewed online: 20/09/17

Table 1 indicates that residents with the Wallacia area travel to work predominately by car, with an overall mode share of 91%. Most workers inbound to the Wallacia area are made also by car, with a mode share of 88%. This high level of car usage is due to the limited public transport provision within the area. The data suggests that a higher percentage of workers walk to work in comparison to using public transport.

3 Development Proposal

3.1 Overview

It is proposed that the cemetery element of the development will occupy two thirds of the available land (approximately 29ha) and will be developed on an 'as needed' basis, in 5 – 10 year increments.

Ultimately the proposed development has the capacity to provide 88,000 plots, with 60,000 graves being implemented over 1 – 50 years and 28,000 graves implemented over 51 – 100 years.

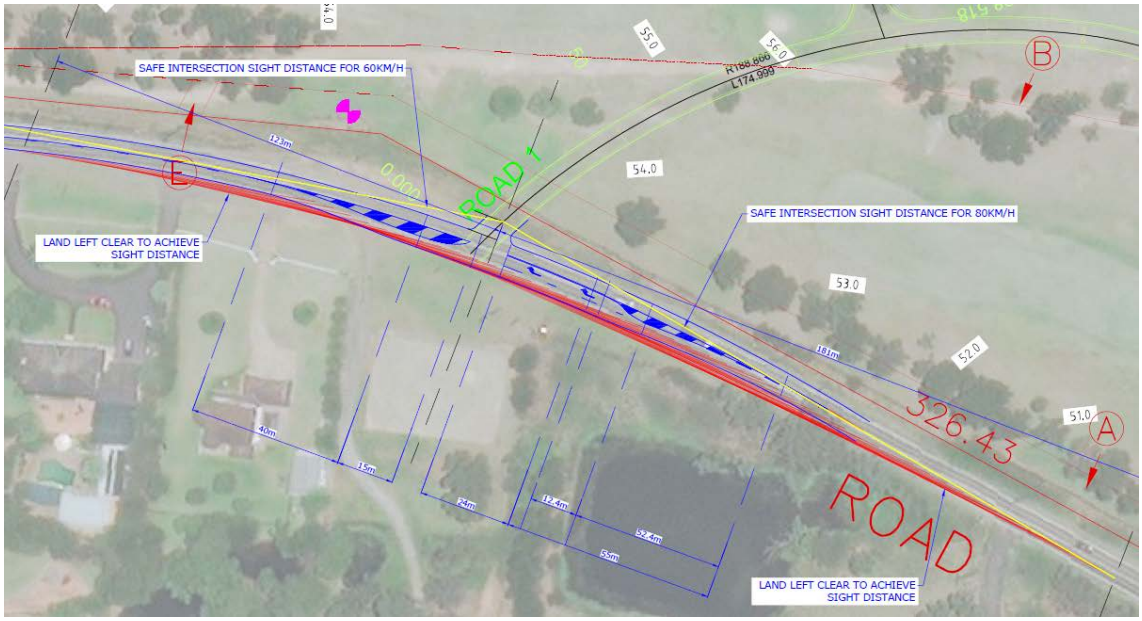
The design of the development essentially involves the following features:

- Gatehouse where funeral processions exchange paperwork and are led to the burial site,
- Function room to welcome families after a funeral or service, located at the existing Panthers Golf Club,
- Chapel with a combined capacity to accommodate 100 visitors,
- Administration office for public enquiries and administrative staff,
- Mortuary facilities for funeral preparation, located close to the main chapel,
- Ground staff facilities with material and equipment storage.

3.2 External Access

Access to the site will be permitted primarily via Park Road, as shown in Figure 9, with suitable intersection treatments provided.

Figure 9: Concept Design of Access Road – Channelised T-junction – Short Lane Type CHR(s)



The proposed access point to and from Park Road, will be the main access point to the cemetery. The concept design shown above, has been developed showing the proposed Channelised T-junction (CHRs). Due to the road width available at the proposed access point, the road is to be widened to maintain traffic lanes in both direction and provide the CHR(s). The proposed priority intersection has been designed in accordance with the Austroads Guide to Road Design Part 4A (2017).

The available site distance from the proposed access point towards the east and west, is considered to provide sufficient Safe Intersection Sight Distance (SISD), between Park Road (major road) and the site (minor road). This means that there is sufficient distance for motorists travelling on Park Road, to observe a vehicle from the internal road approach moving into a collision situation and to decelerate to a stop before reaching the collision point. Adopting the SISD, the required SISD as specified in the Austroads Guide is:

- 123m in a road with a speed limit of 60km/h,
- 181m in a road with a speed limit of 80km/h.

The available SISD at the proposed site access is sufficient to meet the required visibility splays demonstrated in the Austroads Guide, with 135m of visibility available to the west of the access and 183m of visibility available to the east.

3.3 Internal Roads

The proposed widths of the internal roads have been designed in accordance with the Planning for Bushfire Protection specifications.

The primary internal roads will measure 8 metres in width, between the kerbs, allowing two-way access and parallel parking on both sides of the road. A concept plan of the proposed internal layout is shown in the figure below.

Figure 10: Concept Design of Internal Roads

It is also proposed to provide a localised 'one-way' internal road, (shown at location A above) which links the existing Panthers golf club (which is likely to be used as function rooms/condolence rooms) to Mulgoa Road.

Access to the proposed work shop will be provided via the internal road network (at Location B) with a separate emergency access provided onto Park Road. Access to the cemetery at this point would not be permitted for the general public.

3.4 Parking Provision

A number of on-site car parking spaces will be provided to accommodate visitors and staff. The proposed parking provision of the site is shown in Table 2. This has been based upon the operational requirements of Catholic Cemeteries.

Table 2: Car Parking Provision

Building	Parking Provision
Chapel Building / Mortuary	41
Administration Office	11
Ground Staff Facilities (Workshop)	6
Function Room (to be located at existing Panthers Golf Club)	61 (Existing)

The site will provide a total of 119 formal parking spaces, consisting of 58 spaces within the proposed cemetery plus kerbside parking available throughout the internal road network and utilising the existing 61 parking spaces at the Panthers Golf Club. Overall the site will provide sufficient parking to accommodate the development.

3.5 Number of Staff

Based on the information provided by the client, the proposed memorial park would have 5 members of administrational staff, including a manager. Additional staff would involve 4 members of ground staff, 2 mortuary staff and 3 gatehouse employees, plus 1 funeral director.

3.6 Opening Hours

The proposed cemetery will operate between the hours of 07:00am and 17:00pm, Monday to Friday and between 07:00am and 12:00pm on a Saturday. Visiting opening hours will be between sunrise and sunset, seven days a week.

3.7 Traffic Management

An internal road network has been proposed to allow access between facilities and graves within the site. The development plan indicates the following measures for traffic management within the development:

- All intersections within the subject site will be priority control with traffic on primary internal road having high priority over secondary roads, except for the internal roundabout.
- The primary internal roads will have their own material (e.g. concrete), whilst minor roads will be laid in a different material (e.g. asphalt).
- The intersection between primary and secondary internal roads will have a threshold treatment of natural stone set into the pavement, acting as a 'rumble strip' and marking the transition between these road types.
- The internal roads would be signposted at a maximum of 20km/h to produce a low speed environment.
- Wayfinding signage will be provided in the internal roads for directional guidance to various key locations.

4 Parking Assessment

Parking will be provided through on site car parks as well as kerbside parking in the internal road network. Two-way roads are proposed to provide parallel parking on both sides and one-way roads to provide parallel parking on one side.

The key parking generators of the proposed development consist of:

- Cemetery
- General visitation in the cemetery
- Staff parking surrounding the offices and other work areas
- Chapel that holds funerals and ceremonies with a combined seating capacity of 100.
- Existing 61 parking spaces at the Panthers Golf Club, to accommodate functions.

The assessment of proposed parking provision is provided below in Table 3.

Table 3: Parking Assessment for Key Parking Generators

Key Parking Generator	GFA (m^2)	Parking Requirement		Parking Requirement	Proposed Parking Provision
		DCP Parking Rate	First Principle Approach		
Chapel		-	• Maximum seating capacity 100 • With a typical average of 2.5 people per car, given people tend to rave in groups for funeral attendance.	40	40
Offices and work areas	-	1 space per 40m^2	• According to the Masterplan, a total of 5 members of staff (4 general office staff and 1 manager) and 3 grounds keepers, will be present on site, assuming 1 p/car.	15	15

These key parking generators would require 55 spaces and the provision of 58 spaces plus ample kerbside parking would sufficiently accommodate these parking needs. Any overflow parking that may occur when the chapel is used at full capacity, the parking demand could be accommodated by kerbside parking around the facilities.

For other facilities within the proposed development, the parking needs and provision are discussed as follows:

- **The mortuary facilities**: Expected to generate a small number of delivery vehicles per day, with typically one to two vehicles occurring concurrently. As such, the provision of two parking spaces is considered sufficient to accommodate the anticipated parking needs.
- **The function rooms**: Are designed to welcome families after a funeral or service, and therefore only a proportion of the family members / visitors are required to be catered for. It is not anticipated that exclusive or additional trips would be generated by the function room itself, however, some parking spaces will be occupied by members of the Golf Club. In addition, family members / visitors may leave their cars at the car park adjacent to the chapel and join other people cars (i.e. higher car occupancy) and reduce the parking demand associated with the use of the function room. Notwithstanding, any overflow parking can be provided on the kerbside, within a short walking distance.

4.1.1 Service Vehicles

Given the nature of the development proposal, a number of service vehicles are expected to access the site on a regular basis, for refuse collection and delivery to the mortuary facilities.

Service vehicles would enter the site via the main access from Park Road, located on the southern boundary of the site. The internal roads would be of sufficient width to accommodate a fire truck with passing traffic (if any).

5 Traffic Assessment

This section assesses the potential traffic generation and impacts associated with the development proposal.

5.1 Estimated Mode Split

As discussed in Section 2.7, the JTW data demonstrates that workers' mode of travel to zone 4969 was 88% by vehicles, either as a driver or passenger. The utilisation of public transport was noted to be 2%.

Given the nature of the cemetery, it is assumed all staff and visitor trips, to and from the site, would be solely dependent on private vehicles. It is anticipated that given the low accessibility to the site, via public transport, buses and trains would not be utilised. The table below demonstrates the expected mode share to and from the site.

Table 4: Estimated Mode Share to and from the Proposed Site

Trips	Train	Bus	Car (Driver and Passenger)	Walked Only	Other	Total
Workers inbound work trips from other destinations	0%	0%	100%	0%	0%	100%
Visitors inbound trips	0%	0%	100%	0%	0%	100%

A typical car occupancy rate of 2.5 people per vehicle has been adopted for cemetery visitors for analytical purposes. This rate is considered reasonable given the nature of the proposed land use as families and friends tend to travel together for grave visitation and funeral ceremonies.

5.2 Traffic Generation

There is no current traffic generation guidance given within the RMS "Guide to Traffic Generating Developments" (2002) that outlines the traffic generation by cemeteries. However, the traffic generation can be determined through comparison with a similar site at the Liverpool and Rockwood Cemeteries where access to public transport is limited. Table 5 outlines their land size and chapel capacity as follows:

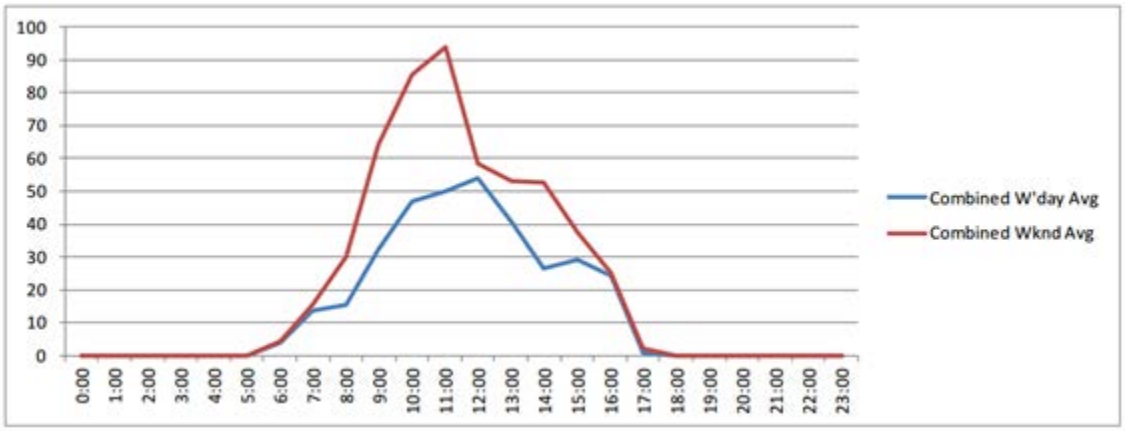
Table 5: Overview of the Similar Cemeteries and the Proposed Cemetery

Site	Size (Ha)	Burial Plots	Chapel Capacity
Liverpool Cemetery	8	24,000	Seated: 180 Standing: 70
Rookwood Cemetery	286	189,400	Crematorium / Chapel: 162 seats SACRED Heart: 80 seats St Michaels: 60 seats Mausoleum: 200 seats Total: 502 seats
Proposed Wallacia Cemetery	44	Stage 1: 1 – 60,000 Stage 2: 60,000 – 88,000	Seated: 100

5.2.1 Sample Site: Liverpool Cemetery

A separate Traffic Impact Assessment, undertaken by GTA Consultants, provided traffic counts at the access point of the Liverpool Cemetery, as shown below in Figure 11.

Figure 11: Existing Two-way Traffic Volumes at Liverpool Cemetery



Source: GTA Consultants

Traffic surveys undertaken at the Liverpool cemetery indicate that the traffic generation was in the order of 30-40 trips during the network AM and PM peak periods. These traffic volumes include staff trips, service vehicles and grave visitation etc, before and after the busiest operational hours of the cemetery.

Typically, funeral ceremonies are held anytime between 10am and 2pm. This is demonstrated above, in Figure 11 above, where site activity peaked between 12pm and 1pm, with 50-60 trips recorded. These traffic volumes would include visitors to the graves, chapels and function room.

5.2.2 Sample Site: Rookwood Cemetery

The Transport Planning Partnership undertook automatic tube counts at the access points of another cemetery, with chapels holding a similar capacity to that proposed. Figure 12 demonstrates the two-way vehicle movements at Rookwood Cemetery.

Figure 12: Existing Two-way Traffic Volumes at Rookwood Cemetery

Traffic surveys undertaken at the Rookwood cemetery indicate the traffic generation was in the order of 460 trips during the site peak hour on an average weekday and 660 trips on Sunday. These traffic volumes would involve visitors to the graves, chapels and function hall.

Traffic survey data for both the Liverpool and Rockwood sites is included in Appendix D.

5.2.3 Wallacia Cemetery

5.2.3.1 Stage 1: 1 – 60,000 Graves

Weekday

Correlating the data shown in Figure 11 and Figure 12, enables a preliminary estimate using a pro-rata method for the likely traffic generation, based on the chapel capacity and number of burial plots in the Liverpool and Macarthur sites.

On this basis, the preliminary estimates of traffic generation for mid-day peak hour is estimated to be:

- 75 - 100 trips (two-way) based on the rate derived using the number of burial plots. This is calculated on the proposed cemetery providing approximately 2.5 times the number of graves provided by the Liverpool Cemetery (2.5 X 30 - 40 two-way trips = 75 - 100 two-way trips).
- 20 - 24 trips (two-way) based on the rate derived using the capacity of the chapels. The proposed cemetery has a reduced capacity of approximately 60% compared to Liverpool Cemetery and a reduced capacity approximately of 80% compared to Rookwood Cemetery. Based on the rates shown above for the Liverpool cemetery (50-60 trips recorded) a reduced chapel area of 60% would result in 20 – 24 two-way trips.

However, the above estimates are understated when compared with the estimates using the first principles approach which is discussed below:

- At Rookwood Cemetery, assuming all 500 visitors attending the funeral(s) would arrive in private vehicles, with a car occupancy of 2.5 people per car, the chapel would generate 200 vehicles. Arrival trips would occur within an hour prior to the start of the funeral, and departure trips would occur over 1-2 hours after the event, depending on the length of the funeral ceremony and the length of stay at the function room after the funeral. This results in a total of 200 inbound trips and 80 outbound trips occurring during the first hour of the event (given the capacity of the function room is 60% of the chapels, thus 40% of the visitors are likely to leave the site). The remaining 120 outbound trips would leave the site during the second hour of the event. The Rookwood Cemetery has a provision of 189,400 graves, resulting to approximately 189 two-way trips per 1000 graves.
- As such, based on the capacity of the proposed chapel, with a car occupancy of 2.5 people per car, the chapel would generate approximately 40 inbound trips during the first service with, say, 60% of people staying to travel to the function room (24 trips) and the remaining 40% being outbound trips (16 vehicles).
- Given the Liverpool site generates 30-40 trips (two-way) during the network peak hours in relation to the staff and grave visitation trips. Projecting these trips based on the number of burial plots in the Liverpool site, it is estimated that 75 - 100 trips (two-way) may occur in relation to visitation at the graves, as demonstrated in the calculations above. It is also assumed that these visitors would leave the site within one hour.

Comparing the pro-rata method and the first principles method, the higher, more conservative estimate is taken as 124 two-way trips, for the site activity peak hour that would occur around mid-day.

For the road network AM and PM peaks, it is estimated 100 trips (50 inbound trips and 50 outbound trips) would occur in relation to grave visitation and staff trips. This has been based on the number of burial plots in the Liverpool cemetery (24,000 burial plots). The proposed

Wallacia has nearly 2.5 times as more burial plots, in Stage 1, in comparison to the Liverpool site, therefore trip generation has been increased.

Table 6 provides a summary of the weekday traffic generation.

Table 6: Weekday Traffic Generation

Peak Hour	Inbound	Outbound	Two-Way
AM Peak (Grave visitation)	50	50	100
AM Peak (Services)	31	9	40
PM Peak (Grave visitation)	50	50	100
PM Peak (Services)	20	20	40
Midday peak (Grave visitation)	50	50	100
Midday peak (Services)	24	16	40

Weekend

The weekend traffic generation has been estimated using surveyed peak hour traffic volumes at the Rookwood Cemetery access points. Table 7 provides a summary of the weekend traffic generation. The peak hour traffic generation for the Rookwood site was in the order of 600 to 660 to-way movements within the AM and PM peak hours, on a Sunday. Given that the proposed Wallacia development is much smaller in scale (approximately 3 times smaller), a conservative estimate of 220 two-way trips has been estimated for the Sunday peak.

Table 7: Weekend Traffic Generation

Peak Hour	Inbound	Outbound	Two-Way
Sunday Peak	116	103	220

N.B the Proposed weekend peak does not include any services.

5.2.3.2 Full Development

It is proposed to provide a total of 88,000 burial sites over the next 100 years. Assuming a worst-case project traffic generation growth in which all burial plots are built in years 51 - 100 over the development period, traffic generation by 2117 would be:

- 180 two-way trips during the network AM / PM peak hours and 180 trips during the site activity peak hour around mid-day on a weekday.

- 330 trips during the network AM / PM peak hours, and 330 trips during the site activity peak hour around mid-day on a weekend.

However, these estimates do not take into account any proposed increase to the chapel capacity so it is assumed that the chapel will continue to provide a total capacity of 100 people even in 100 years.

5.2.3.3 Modelling Assumptions

For the purposes of traffic modelling, only the Stage 1 development which has 60,000 burial plots (to be developed by 2067) was assessed based on the following assumptions:

- A ten-year planning horizon is a realistic timeframe for the assessment, although the traffic generation considers the stage 1 total of 60,000 burial plots, for completion in 2067.
- All vehicular trips associated with grave yard visitation, chapel attendance, staff arrival and departure to be superimposed on the relatively higher background traffic volume in the network AM and PM peak hours. The sum of the network AM and PM peak hour traffic volumes and the mid-day traffic generation is considered a conservative approach to assess the operational conditions of the key intersections:

Weekday

- Superimpose 140 trips (81 inbound and 59 outbound) associated with chapel attendance and grave visitation to the network AM peak hour background traffic volumes.
- Superimpose 140 trips (70 inbound and 70 outbound) associated with the grave visitation and the visitor's departure from the function room to the network PM peak hour background traffic volumes.

Weekend

- Superimpose 220 trips (116 inbound and 103 outbound) associated with chapel attendance and grave visitation to the network Sunday peak hour background traffic volumes.
- Only the main access point has been assessed so an assumption has been made that all site related inbound and outbound traffic would be concentrated at this point on the southern boundary of the site onto Park Road.
- The surrounding network is assumed to be the same as per the existing conditions apart from the proposed right turn treatment.
- 40 of the outbound vehicles have been diverted to the Panthers Golf Club, to represent visitors attending functions.

5.3 Traffic Distribution

Traffic surveys undertaken on Thursday 7th September and Sunday 10th September 2017, identified the following peak hours:

- Weekday AM Peak: 07:00am – 08:00am
- Weekday PM peak: 15:30pm – 14:30pm
- Sunday Peak: 11:30am – 12:30pm

Based on the wider road network, the following directional distributions have been assumed. These distributions represent the worst-case scenario:

- At the proposed site access
- During the Sunday Peak, 40 vehicles departing the Cemetery have been diverted into the Panthers Golf Club car park, to represent vehicles travelling to functions.
- All arriving and departing vehicles have been distributed on existing distribution percentages.

The figures below show the anticipated increases in turning movements near the subject site, as a result of the cemetery.

Figure 13: Proposed Weekday AM Peak Traffic Flows

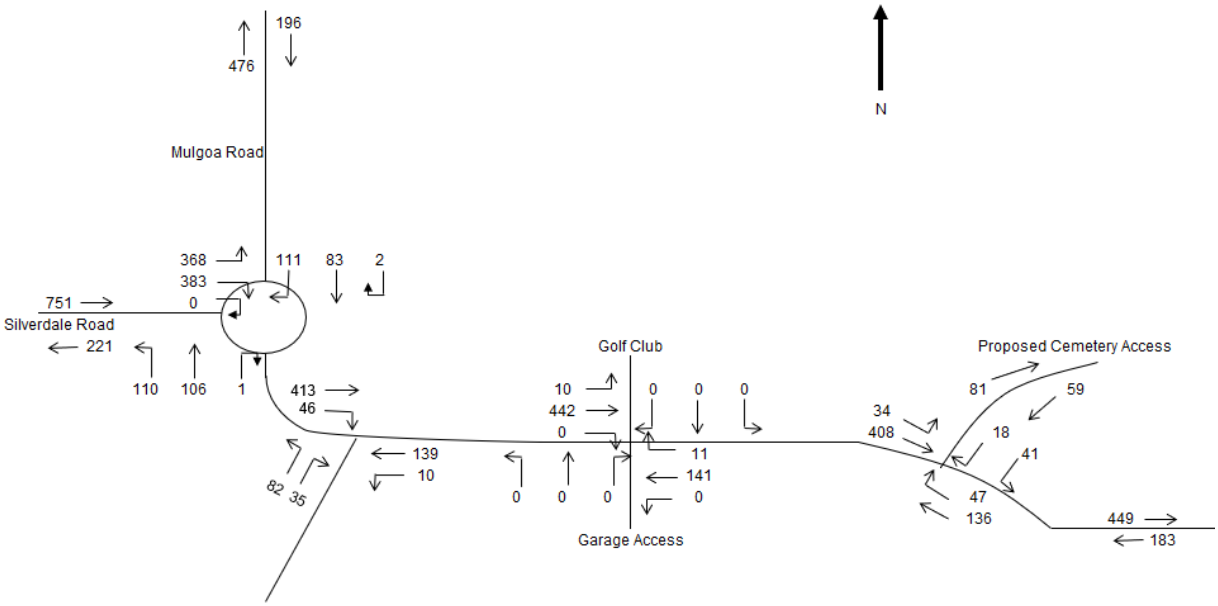


Figure 14: Proposed Weekday PM Peak Traffic Flows

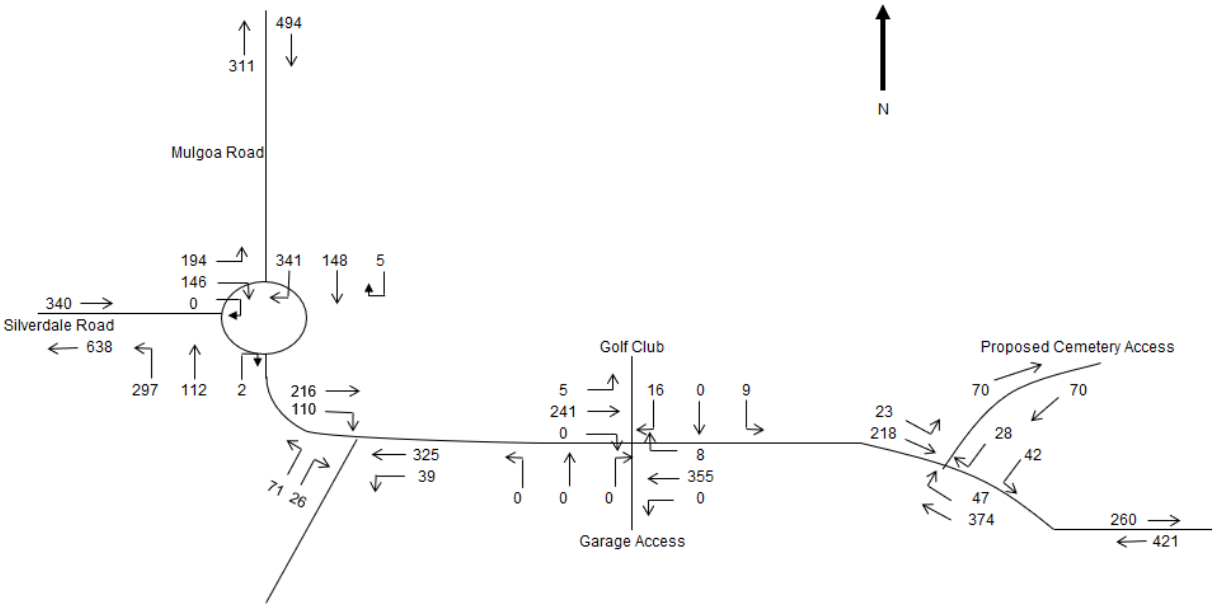
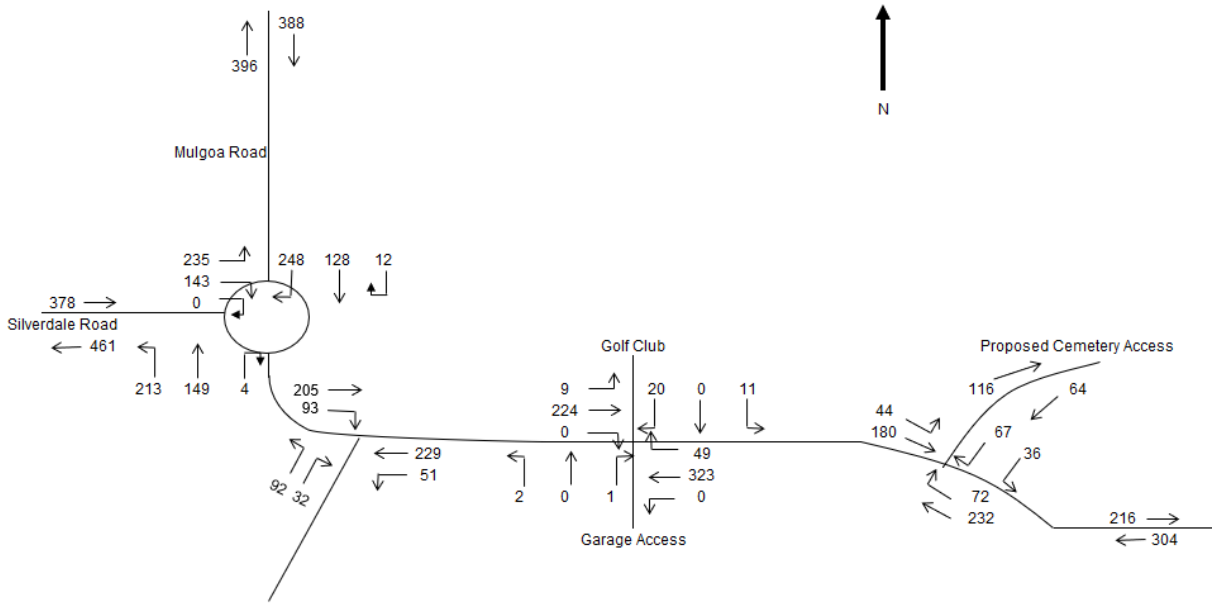


Figure 15: Proposed Sunday Peak Traffic Flows



As mentioned previously, all flow diagrams can be found in Appendix A.

5.4 Performance of Key Intersections

The operation of key intersections has been assessed using SIDRA Intersection 7, a computer based modelling package which assesses intersection performance under prevailing traffic conditions.

5.4.1 Model Performance Indicators

SIDRA Intersection 7 modelling provides several useful indicators to determine the level of intersection performance.

5.4.1.1 Level of Service (LoS)

LoS is a basic performance parameter used to describe the operation of an intersection. Levels of service indicators range from A (indicating good intersection operation) to F (indicating over-saturated conditions with long delays and queues). At priority controlled (give-way and stop controlled) and roundabout intersections, the LoS is based on the modelled delay (seconds per vehicle) for the most delayed movement. The level of service criteria for intersections can be found below in Table 8.

Table 8: Level of Service Criteria for Intersections

Level of Service	Average Delay (seconds per vehicle)	Traffic Signals, Roundabout	Give Way and Stop Signs
A	Less than 14	good operation	good operation
B	15 to 28	good with acceptable delays and spare capacity	acceptable delays and spare capacity
C	29 to 42	satisfactory	satisfactory, but accident study required
D	43 to 56	operating near capacity	near capacity and accident study required
E	57 to 70	at capacity At signals, incidents will cause excessive delays.	at capacity, requires other control mode
F	Greater than 71	unsatisfactory with excessive queuing	unsatisfactory with excessive queuing; requires other control mode

Source: RMS Guide to Traffic Generating Developments, 2002

5.4.1.2 Average Delay

Delay is the difference between interrupted and uninterrupted travel times through the intersection and is measured in seconds per vehicle. At priority controlled intersections and roundabouts, the average delay for the most delayed movement is usually reported.

5.4.2 Existing and Future Scenarios

Intersection analysis was conducted for the intersections of:

- Proposed Site Access
- Park Road / Silverdale Road / Mulgoa Road – 3 Arm Priority Roundabout Intersection
- Panther Wallacia Golf Club House Entrance / Park Road – Priority Access
- Park Road / Greendale Road – 3 Arm Priority Intersection

The analysis assessed the intersections operating under existing and future conditions, using the peak hour flows presented in Table 6 and Table 7. The average delay and Level of Service, for the worst arm on the intersection has been demonstrated.

Network peak traffic flows, which were identified during the traffic surveys, have be utilised when determining traffic already travelling on the network. It is noted that the network peaks differ from the anticipated peak hours of the cemetery (i.e. Existing AM peak on Park Road identified between 7:00am – 8:00am). To ensure a 'worst case' scenario is demonstrated within the traffic modelling, these flows have been utilised within the modelling.

Table 9: SIDRA Intersection Modelling Results

Weekday/ Weekend	Intersection	Scenario	AM Peak Hour		PM Peak Hour	
			Delay (Seconds)	Level of Service	Delay (Seconds)	Level of Service
Weekday	Site Access/ Park Road	Existing	0	A	0	A
		Existing + Proposed	11	A	11	A
	Panthers Golf Club / Park Road	Existing	9	A	10	A
		Existing + Proposed	10	A	10	A
	Park Road / Greendale Road	Existing	8	A	8	A
		Existing + Proposed	8	A	9	A
	Park Road/ Silverdale Road Roundabout	Existing	13	A	14	A
		Existing + Proposed	13	A	15	B
Weekend	Intersection	Scenario	Sunday Peak Hour			
			Delay (Seconds)		Level of Service	
	Site Access/ Park Road	Existing	0		A	
		Existing + Proposed	9		A	
	Panthers Golf Club / Park Road	Existing	9		A	
		Existing + Proposed	8		A	
	Park Road / Greendale Road	Existing	7		A	
		Existing + Proposed	7		A	
	Park Road/ Silverdale Road Roundabout	Existing	11		A	
		Existing + Proposed	12		A	

N.B. The delay at the worst movement has been reported.

The modelling analysis results demonstrate that all intersections currently operate good, with a Level of Service (A/B) and low delays. The proposed development shows that there would not be any impacts to intersection Level of Service, with minimal increase in delay at the proposed site access. The SIDRA outputs of the scenarios demonstrated above can be found in Appendix E.

6 Conclusions

This transport impact assessment report accompanies a development application for the proposed new cemetery located at 13 Park Road, Wallacia.

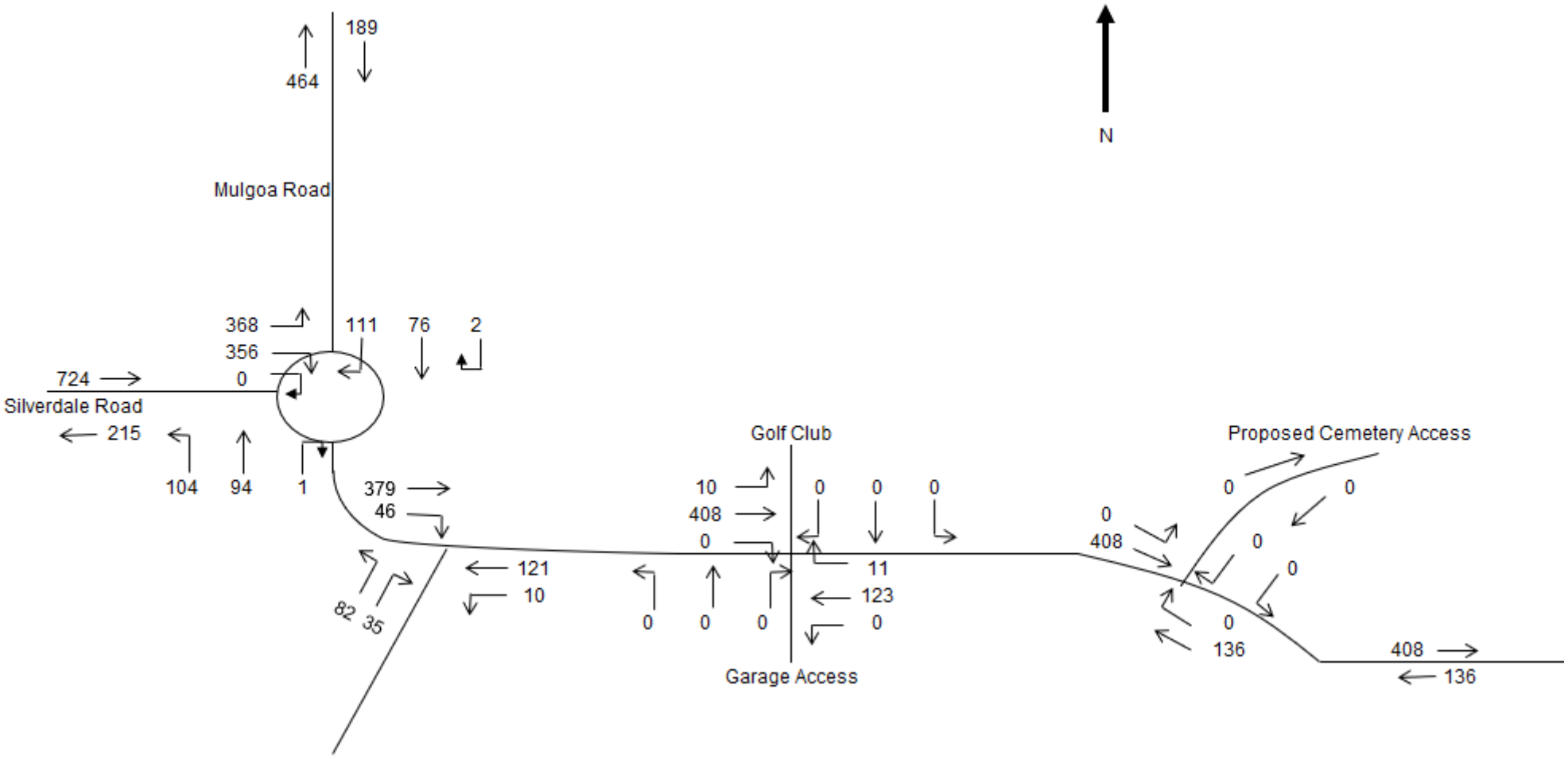
The key findings from this report are provided below:

- There is sufficient SISD at the proposed site access point. It is considered that vehicles egressing the site would have sufficient visibility to exit the site safely.
- Internal road widths satisfy NSW Rural Fire Services requirements.
- There are sufficient internal car parking spaces for visitors and staff, with additional kerbside parking within the internal road layout, providing appropriate parking provision.
- Both Park Road and the proposed site access have sufficient capacity to accommodate expected traffic volumes anticipated from the development. The existing Panthers Golf Club intersection also has appropriate spare capacity to cope with vehicles entering the site in relation to the proposed 'Function Room' facility.
- The proposed development is expected to generate moderate levels of traffic and would not have a detrimental impact on the existing road network.
- Overall, there will be no adverse traffic and parking implications associated with the proposal.

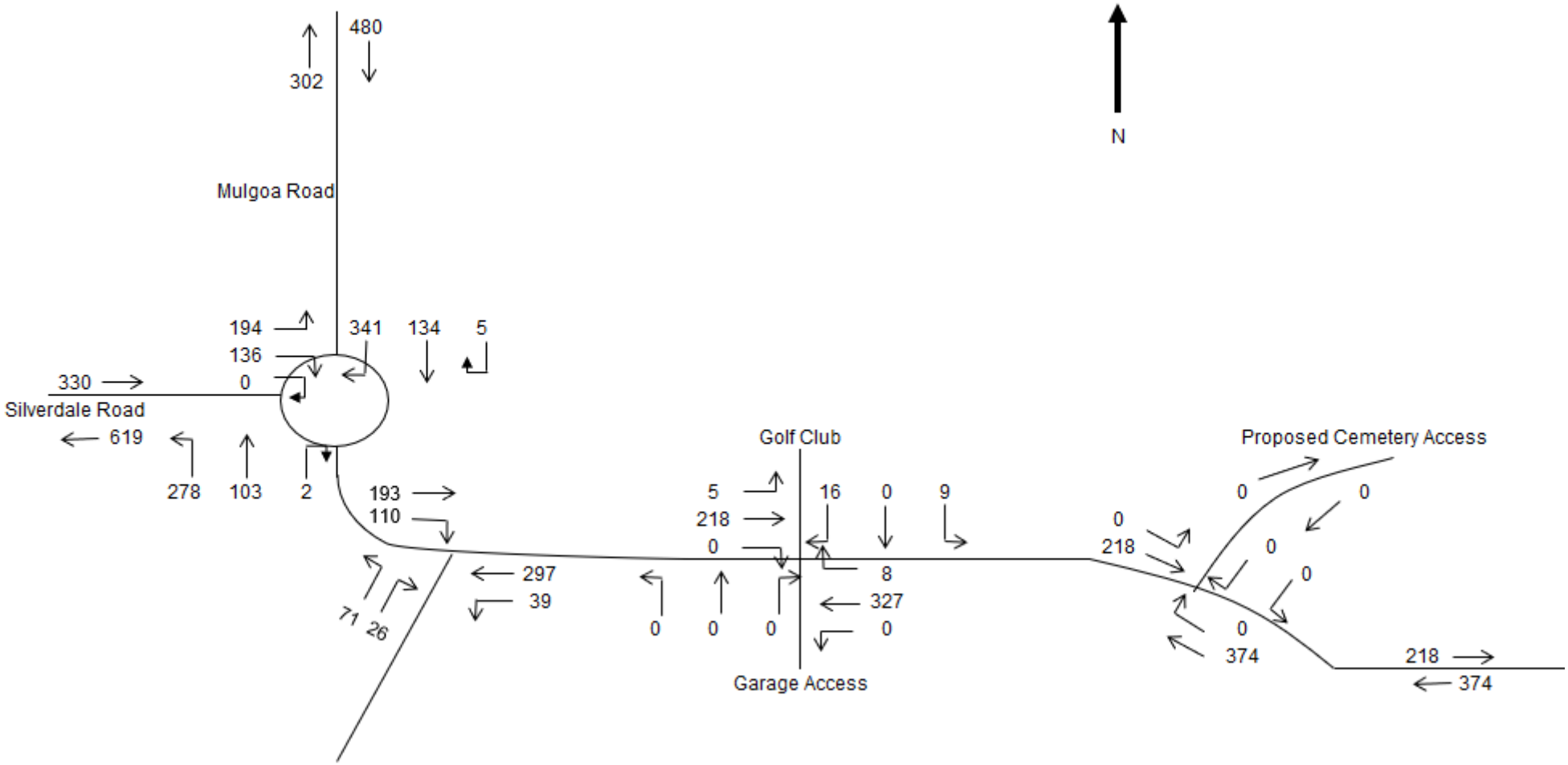
Appendix A

Traffic Flow Diagrams

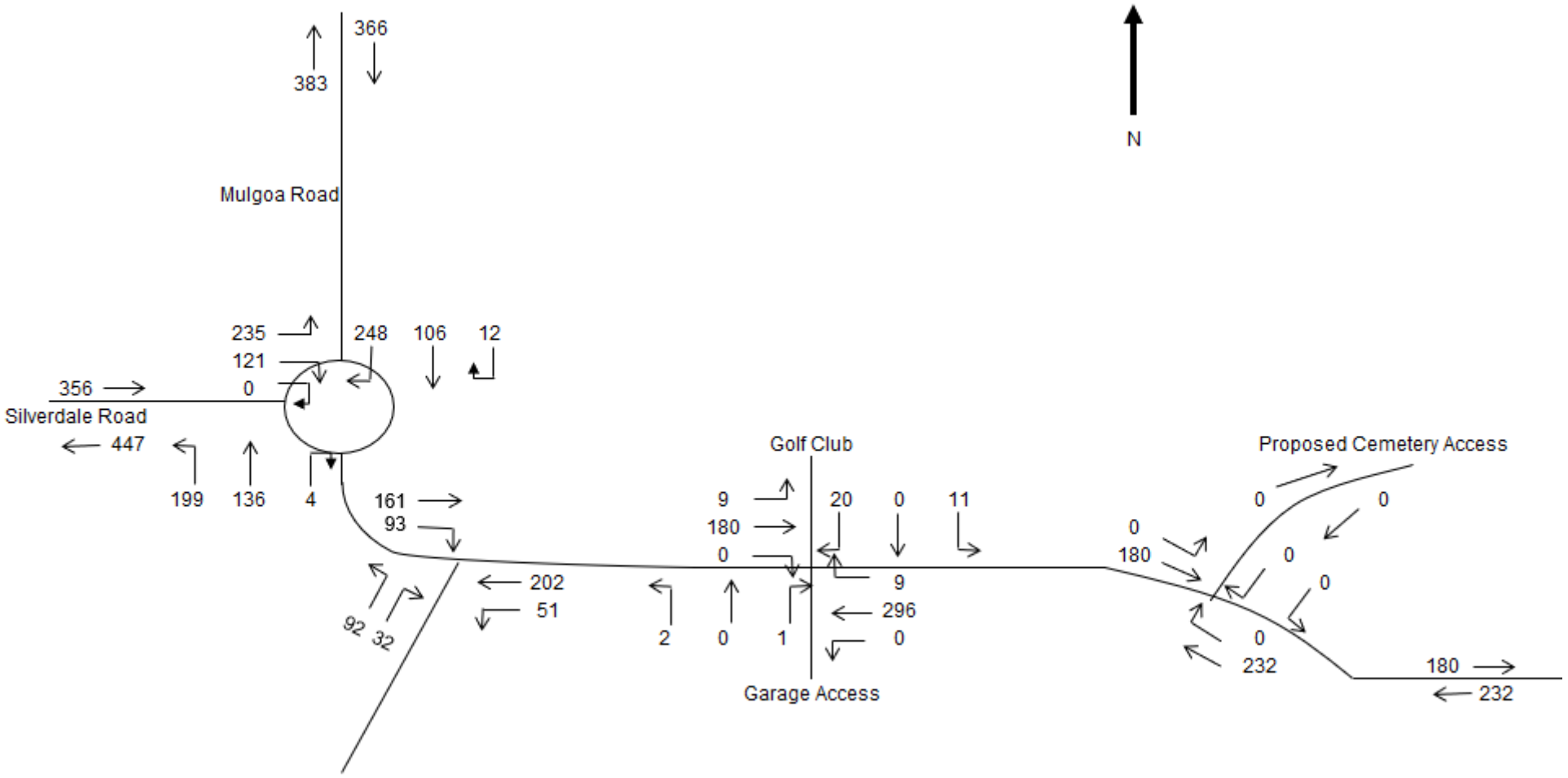
Thursday AM Peak



Thursday PM Peak



Sunday Midday Peak



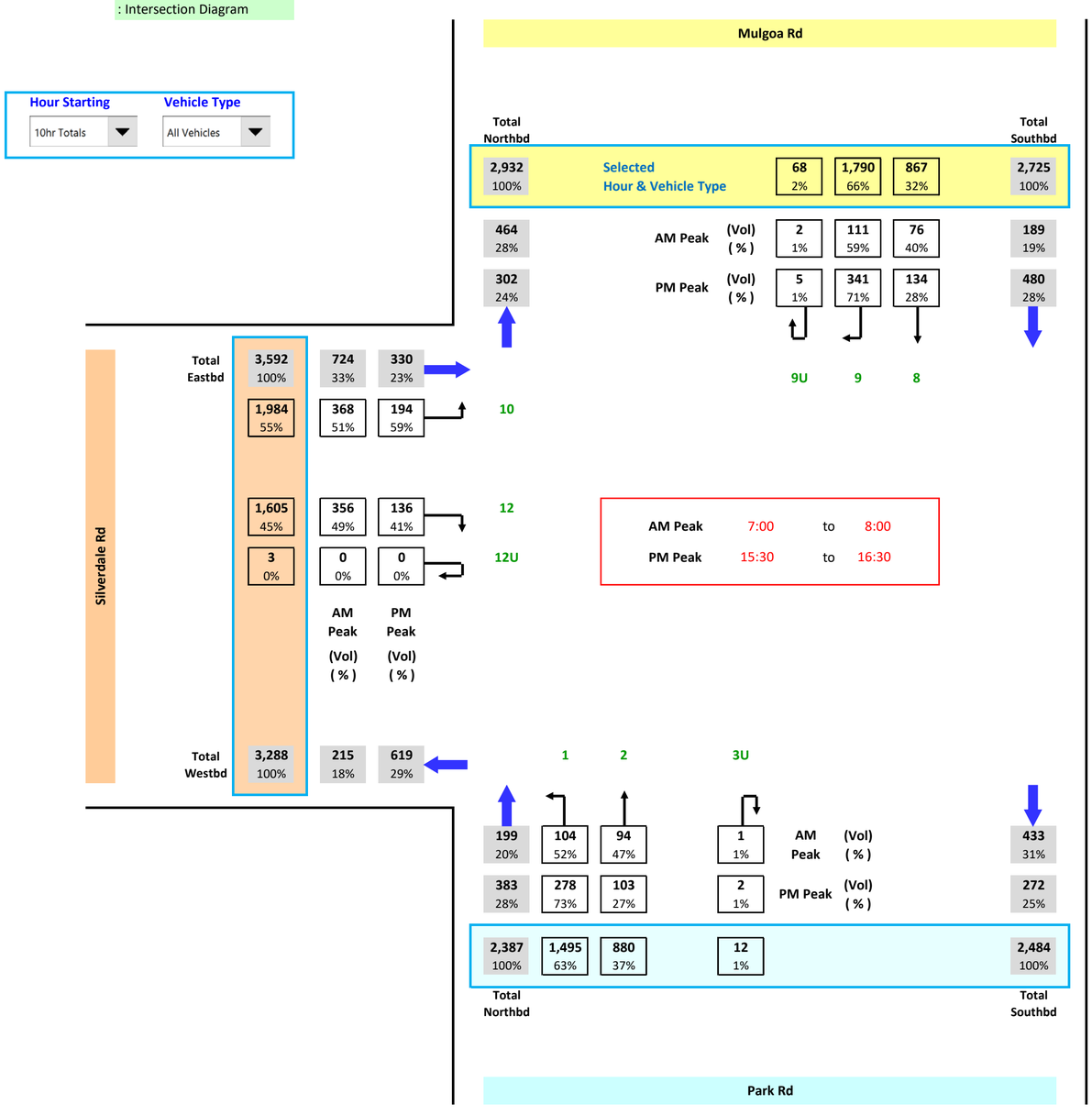
Appendix B

Traffic Surveys

Job No. : N3530
Client : TTPP
Suburb : Wallacia
Location : 1. Park Rd / Silverdale Rd / Mulgoa Rd

Day/Date : Thu, 7th September 2017
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

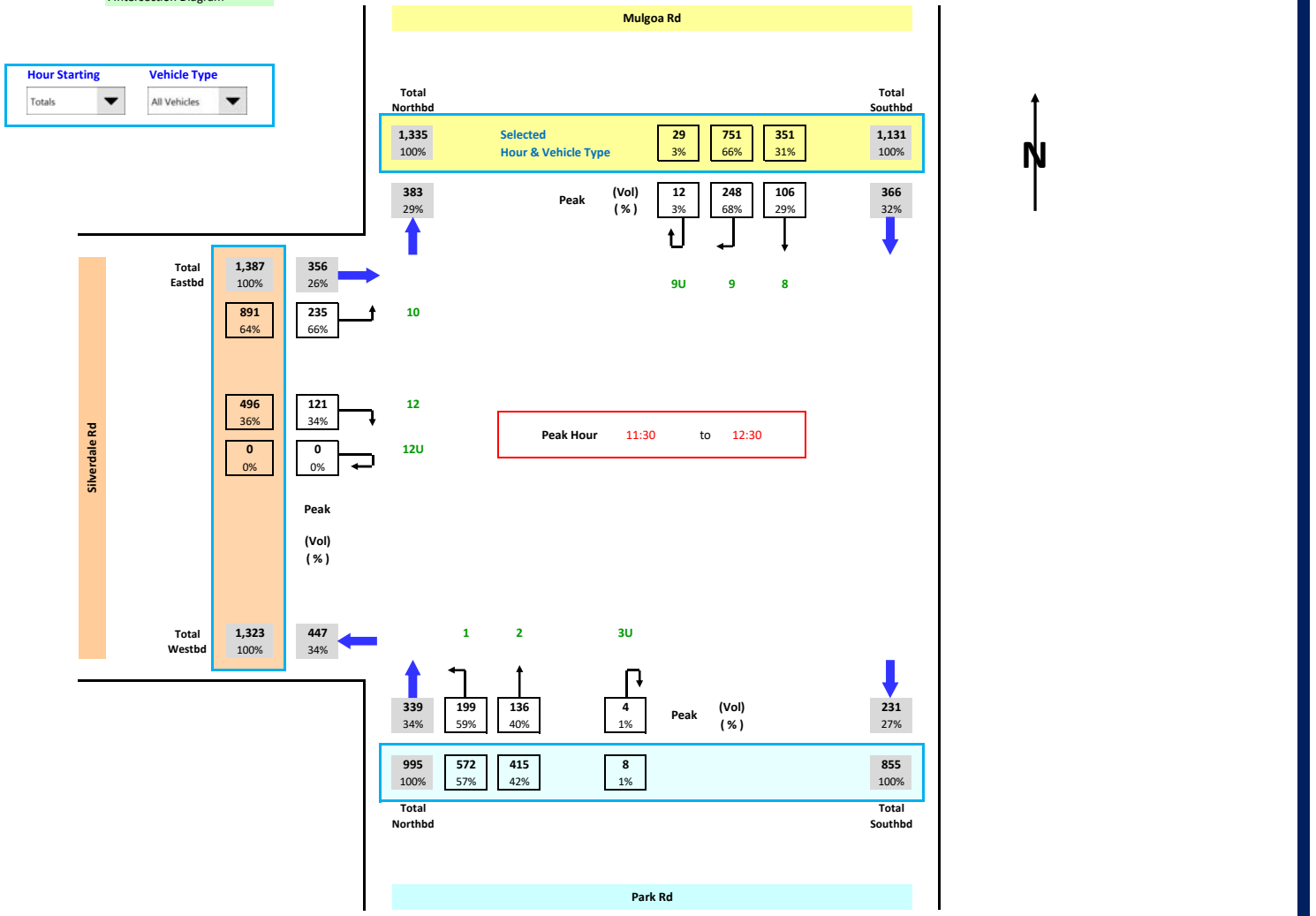
MATRIX Traffic and Transport Data



Job No. : N3530
Client : TTPP
Suburb : Wallacia
Location : 1. Park Rd / Silverdale Rd / Mulgoa Rd

Day/Date : Sun, 10th September 2017
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

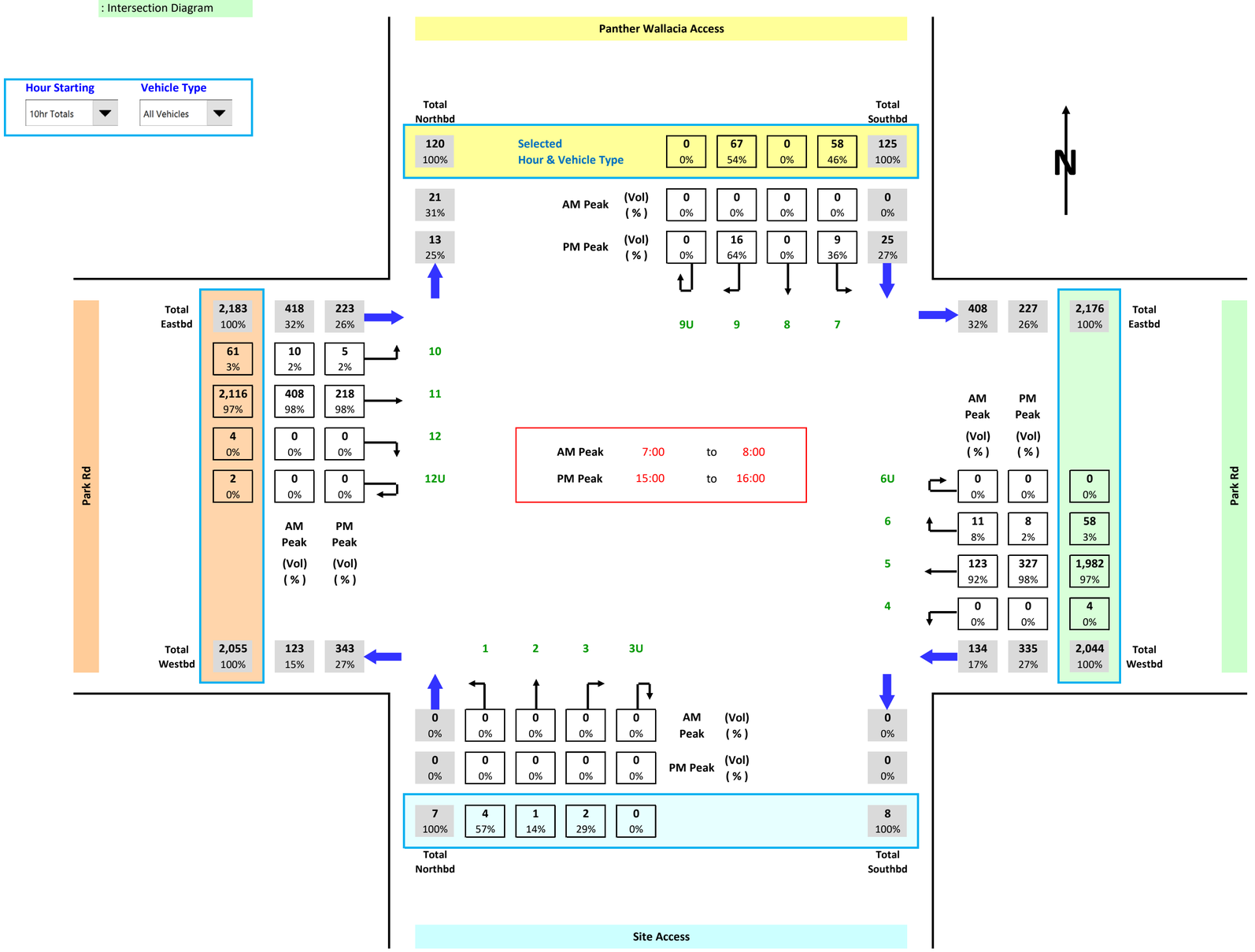
MATRIX Traffic and Transport Data



Job No. : N3530
Client : TTPP
Suburb : Wallacia
Location : 2. Park Rd / Panther Wallacia Gold Club House Access

Day/Date : Thu, 7th September 2017
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

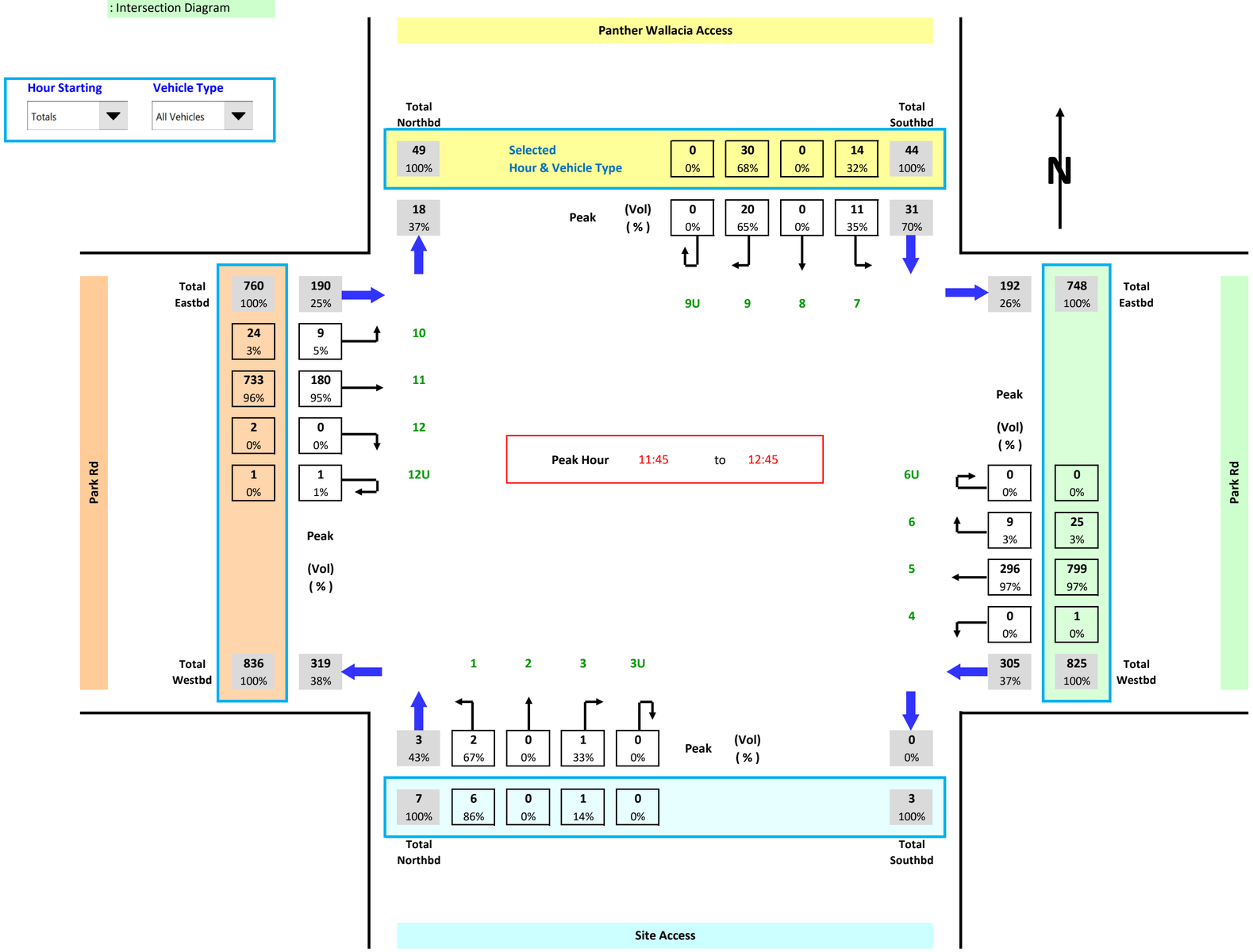
MATRIX Traffic and Transport Data



Job No. : N3530
Client : TTPP
Suburb : Wallacia
Location : 2. Park Rd / Panther Wallacia Gold Club House Access

Day/Date : Sun, 10th September 2017
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

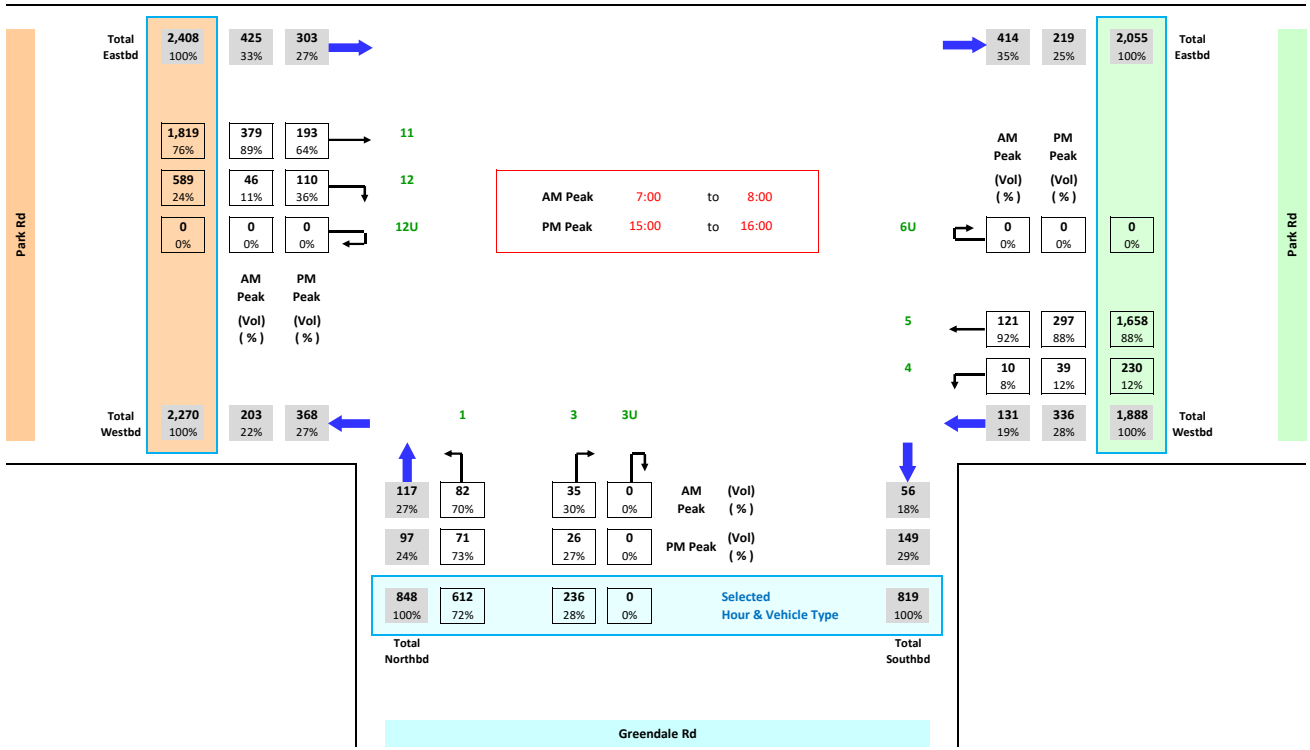
MATRIX Traffic and Transport Data



Job No. : N3970
Client : TTPP
Suburb : Wallacia
Location : 1. Park Rd / Greendale Rd

Day/Date : Thu, 1st March 2018
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

Hour Starting	Vehicle Type
Totals	All Vehicles

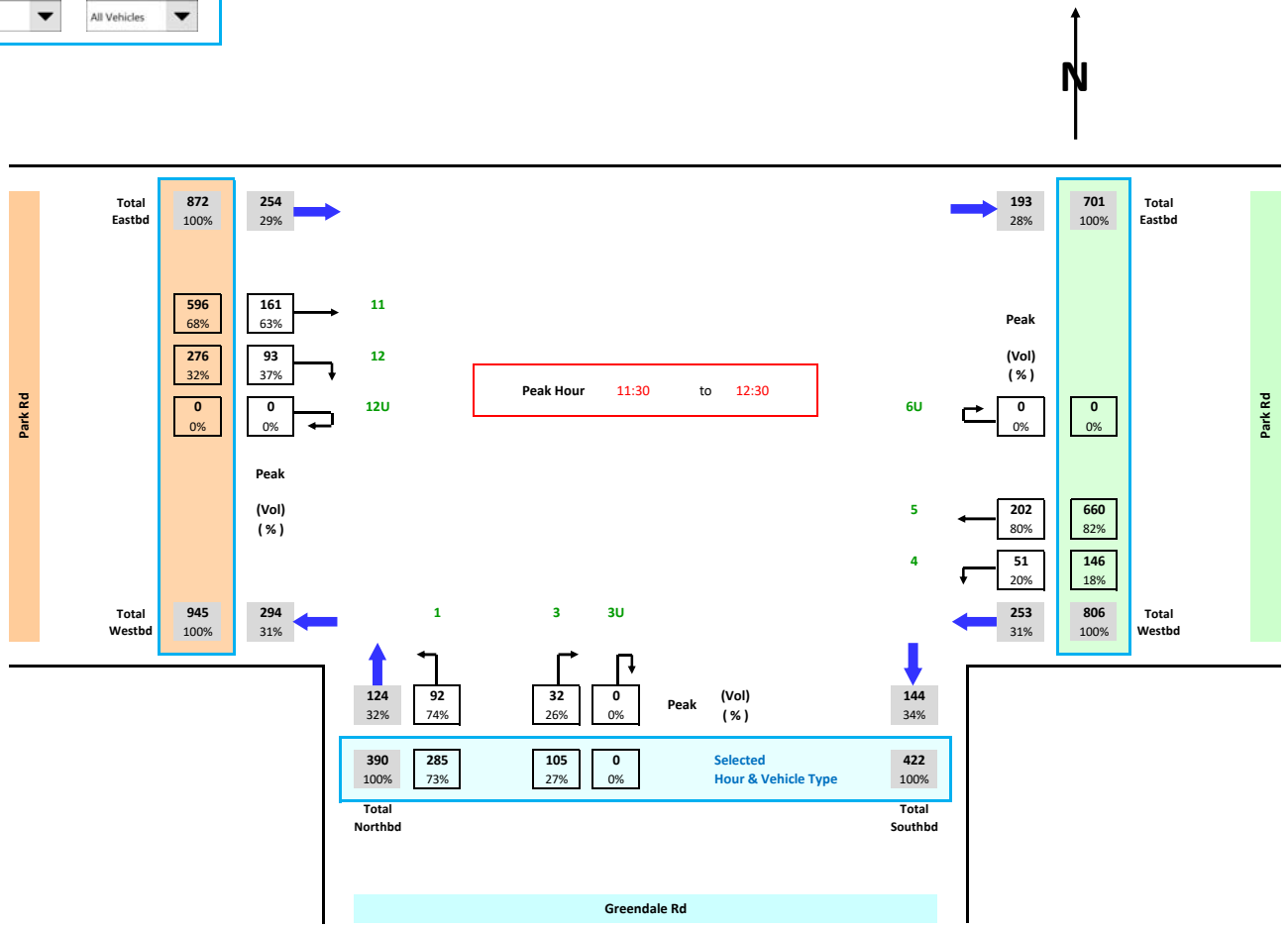


Job No. : N3970
Client : TTPP
Suburb : Wallacia
Location : 1. Park Rd / Greendale Rd

Day/Date : Sun, 11th March 2018
Weather : Fine
Description : Classified Intersection Count
: Intersection Diagram

MATRIX Traffic and Transport Data

Hour Starting	Vehicle Type
Totals	All Vehicles



Appendix C

RMS Vehicle Accident Data

Summary Crash Report

# Crash Type		
Car Crash	8	88.9%
Light Truck Crash	2	22.2%
Rigid Truck Crash	2	22.2%
Articulated Truck Crash	0	0.0%
'Heavy Truck Crash	*(2)*	*(22.2%)*
Bus Crash	1	11.1%
"Heavy Vehicle Crash	*(2)*	*(22.2%)*
Emergency Vehicle Crash	0	0.0%
Motorcycle Crash	1	11.1%
Pedal Cycle Crash	0	0.0%
Pedestrian Crash	0	0.0%

' Rigid or Artic. Truck " Heavy Truck or Heavy Bus
These categories are NOT mutually exclusive

Location Type		
*Intersection	0	0.0%
Non intersection	9	100.0%

* Up to 10 metres from an intersection

Collision Type		
Single Vehicle	1	11.1%
Multi Vehicle	8	88.9%

Road Classification		
Freeway/Motorway	0	0.0%
State Highway	0	0.0%
Other Classified Road	4	44.4%
Unclassified Road	5	55.6%

Contributing Factors		
Speeding	3	33.3%
Fatigue	1	11.1%

Weather		
Fine	8	88.9%
Rain	1	11.1%
Overcast	0	0.0%
Fog or mist	0	0.0%
Other	0	0.0%

Road Surface Condition		
Wet	1	11.1%
Dry	8	88.9%
Snow or ice	0	0.0%

Natural Lighting		
Dawn	0	0.0%
Daylight	7	77.8%
Dusk	0	0.0%
Darkness	2	22.2%

Crash Movement		
Intersection, adjacent approaches	0	0.0%
Head-on (not overtaking)	2	22.2%
Opposing vehicles; turning	0	0.0%
U-turn	0	0.0%
Rear-end	2	22.2%
Lane change	0	0.0%
Parallel lanes; turning	0	0.0%
Vehicle leaving driveway	0	0.0%
Overtaking; same direction	0	0.0%
Hit parked vehicle	0	0.0%
Hit railway train	0	0.0%
Hit pedestrian	0	0.0%
Permanent obstruction on road	0	0.0%
Hit animal	0	0.0%
Off road, on straight	0	0.0%
Off road on straight, hit object	3	33.3%
Out of control on straight	0	0.0%
Off road, on curve	0	0.0%
Off road on curve, hit object	0	0.0%
Out of control on curve	0	0.0%
Other crash type	2	22.2%

Speed Limit					
40 km/h or less	0	0.0%	80 km/h zone	4	44.4%
50 km/h zone	2	22.2%	90 km/h zone	0	0.0%
60 km/h zone	3	33.3%	100 km/h zone	0	0.0%
70 km/h zone	0	0.0%	110 km/h zone	0	0.0%

~ 07:30-09:30 or 14:30-17:00 on school days	~ 40km/h or less	0	0.0%	~ School Travel Time Involvement	3	33.3%

Day of the Week												
Monday	0	0.0%	Wednesday	0	0.0%	Friday	2	22.2%	Sunday	2	22.2%	WEEKEND	4	44.4%
Tuesday	0	0.0%	Thursday	3	33.3%	Saturday	2	22.2%	WEEKDAY	5	55.6%			

CRASHES	9	
Fatal	0	0.0%
Serious inj.	4	44.4%
Moderate inj.	0	0.0%
Minor/Other inj.	3	33.3%
Uncategorised inj.	0	0.0%
Non-casualty	2	22.2%

Self Reported Crash	2	22.22%

Time Group		% of Day	
00:01 - 02:59	0	0.0%	12.5%
03:00 - 04:59	0	0.0%	8.3%
05:00 - 05:59	0	0.0%	4.2%
06:00 - 06:59	0	0.0%	4.2%
07:00 - 07:59	0	0.0%	4.2%
08:00 - 08:59	0	0.0%	4.2%
09:00 - 09:59	1	11.1%	4.2%
10:00 - 10:59	0	0.0%	4.2%
11:00 - 11:59	2	22.2%	4.2%
12:00 - 12:59	0	0.0%	4.2%
13:00 - 13:59	0	0.0%	4.2%
14:00 - 14:59	1	11.1%	4.2%
15:00 - 15:59	1	11.1%	4.2%
16:00 - 16:59	2	22.2%	4.2%
17:00 - 17:59	0	0.0%	4.2%
18:00 - 18:59	1	11.1%	4.2%
19:00 - 19:59	0	0.0%	4.2%
20:00 - 21:59	0	0.0%	8.3%
22:00 - 24:00	1	11.1%	8.3%

Street Lighting Off/Nil		% of Dark
1	of 2	in Dark 50.0%

CASUALTIES	9	
Killed	0	0.0%
Seriously inj.	4	44.4%
Moderately inj.	0	0.0%
Minor/Other inj.	5	55.6%
Uncategorised inj.	0	0.0%
^ Unrestrained	0	0.0%

^ Belt fitted but not worn, No restraint fitted to position OR No helmet worn

Crashes		Casualties
2	2016	2
2	2015	1
1	2014	1
2	2013	3
2	2012	2

McLean Periods		% Week	
A	0	0.0%	17.9%
B	0	0.0%	7.1%
C	2	22.2%	17.9%
D	1	11.1%	3.5%
E	1	11.1%	3.6%
F	0	0.0%	10.7%
G	3	33.3%	7.1%
H	1	11.1%	7.1%
I	0	0.0%	12.5%
J	1	11.1%	10.7%

#Holiday Periods																		
New Year	0	0.0%	Easter	0	0.0%	Queen's BD	0	0.0%	Christmas	0	0.0%	Easter SH	0	0.0%	Sept./Oct. SH	0	0.0%	
Aust. Day	0	0.0%	Anzac Day	0	0.0%	Labour Day	0	0.0%	January SH	2	22.2%	June/July SH	3	33.3%	December SH	0	0.0%	

Crashid dataset 7360 - Park Road - Panther Wallacia Golf Club Crash Data - 1 Jan 2012 to 31 Dec 2016

Note: Crash self reporting, including self reported injuries began Oct 2014. Trends from 2014 are expected to vary from previous yrs. More unknowns are expected in self reported data. Reporting yrs 1996-2004 and 2017 onwards contain uncategorised inj crashes.

Percentages are percentages of all crashes. Unknown values for each category are not shown on this report.

Detailed Crash Report

NOTES: 7360 - Park Road - Panther Wallacia Golf Club Crash Data - 1 Jan 2012 to 31 Dec 2016

Crash No.	Data Source	Date	Day of Week	Time	Distance		ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors S	Factors F
Sydney Region																										
Penrith LGA																										
Mulgoa																										
Mulgoa Rd																										
1112296	P	02/07/2016	Sat	11:30	966 m	N	GREENDALE RD	2WY	CRV	Fine	Dry	80	2	M/C	M58	N in MULGOA RD	65	Incorrect side	SC	0	1	0	0	0		
E62163143								RUM	20	Head on				CAR	F18	S in MULGOA RD	65	Proceeding in lane								
843955	P	04/07/2013	Thu	16:30	500 m	N	PARK RD	2WY	STR	Fine	Dry	80	2	CAR	M30	S in MULGOA RD	70	Proceeding in lane	OC	0	0	0	3	0		
E100787302								RUM	32	Right rear				4WD	F23	S in MULGOA RD	0	Wait turn right								
802028	P	28/06/2012	Thu	16:10	950 m	N	SILVERDALE RD	2WY	CRV	Fine	Dry	80	2	BUS	F46	S in MULGOA RD	10	Pulling out	OC	0	0	0	1	0	S	
E50894381								RUM	43	Entering parking				LOR	M38	S in MULGOA RD	55	Proceeding in lane								
Wallacia																										
Greendale Rd																										
802312	P	30/06/2012	Sat	22:40	300 m	S	PARK RD	2WY	STR	Fine	Dry	50	2	CAR	M38	S in GREENDALE RD	Unk	Proceeding in lane	SC	0	1	0	0	0	S	
E49185739								RUM	73	Off rd rght => obj				4WD		S in GREENDALE RD	0	Parked								
Park Rd																										
1057440	P	20/11/2014	Thu	09:25	400 m	W	JAMES ST	2WY	STR	Fine	Dry	80	2	TRK	M72	W in PARK RD	20	Perform U-turn	SC	0	1	0	0	0		
E56465957								RUM	42	Leaving parking				CAR	F41	E in PARK RD	80	Proceeding in lane								
Peter Pan Ave																										
842244	P	16/06/2013	Sun	18:50	50 m	E	GREENDALE RD	2WY	STR	Fine	Dry	50	2	UTE	M27	E in PETER PAN AVE	80	Proceeding in lane	NC	0	0	0	0	0	S	F
E50785560								RUM	71	Off rd left => obj				TRK		E in PETER PAN AVE	0	Parked								
Silverdale Rd																										
1055875	S	11/01/2015	Sun	11:50	20 m	W	MULGOA RD	2WY	STR	Raining	Wet	60	1	CAR	F28	W in SILVERDALE RD	Unk	Proceeding in lane	NC	0	0	0	0	0		
E56532552								RUM	71	Off rd left => obj				Utility pole												
1058285	P	16/01/2015	Fri	14:00	20 m	W	MULGOA RD	2WY	CRV	Fine	Dry	60	3	LOR	M61	W in SILVERDALE RD	50	Incorrect side	SC	0	1	0	0	0		
E57229058								RUM	20	Head on				CAR	M41	E in SILVERDALE RD	50	Proceeding in lane								
														CAR	M57	E in SILVERDALE RD	50	Proceeding in lane								
1119514	S	11/11/2016	Fri	15:50		at	NUMBER 2 HN	2WY	STR	Fine	Dry	60	2	CAR	M18	W in SILVERDALE RD	Unk	Proceeding in lane	OC	0	0	0	1	0		
E63314628								RUM	31	Left rear				CAR	F29	W in SILVERDALE RD	Unk	Turning left								

Report Totals: Crashes: 9 Fatal Crashes(FC): 0 Serious Injury Crashes(SC): 4 Moderate Injury Crashes(MC): 0 Minor/Other Injury Crashes(OC): 3 Uncategorised Injury Crashes(UC): 0 Non-Casualty Crashes(NC): 2

Killed(K): 0 Seriously Injured(S): 4 Moderately Injured(M): 0 Minor/Other Injured(O): 5 Uncategorised Injured(U): 0

Crashid dataset 7360 - Park Road - Panther Wallacia Golf Club Crash Data - 1 Jan 2012 to 31 Dec 2016

Crash self reporting, including self reported injuries began Oct 2014. Trends from 2014 are expected to vary from previous yrs. More unknowns are expected in self reported data.

Detailed Crash Report

Crash No.	Data Source	Date	Day of Week	Time	Distance	ID Feature	Loc Type	Alignment	Weather	Surface Condition	Speed Limit	No. of Tus	Tu Type/Obj	Age/Sex	Street Travelling	Speed Travelling	Manoeuvre	Degree of Crash-Detailed	Killed	Seriously Inj.	Moderately Inj.	Minor/Other Inj.	Uncateg'd Inj.	Factors	S	F

Reporting yrs 1996-2004 and 2017 onwards contain uncategorised inj crashes.

Appendix D

Liverpool and Rockwood Cemetery Site Survey Data

Job No	N3325
Client	TTPP
Site	St Andrews Rd - north of Spitfire rd
Location	Varroville
Site No	1
Start Dat	9-Jun-17
Descripti	Volume Summary
Direction	NB

Hour	Day of Week							W'Day	7 Day
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
Starting	12-Jun	13-Jun	14-Jun	15-Jun	9-Jun	10-Jun	11-Jun	Ave	Ave
AM Peak	14	41	33	28	57	50	194	Ave	Ave
PM Peak	15	42	55	56	49	73	24	279	325
0:00	2	1	1	1	0	0	6	1	2
1:00	4	1	1	2	0	4	3	2	2
2:00	0	0	2	0	0	0	4	0	1
3:00	0	0	1	0	1	0	1	0	0
4:00	0	1	0	1	2	0	1	1	1
5:00	1	0	2	1	0	0	0	1	1
6:00	8	6	2	8	12	2	1	7	6
7:00	12	17	14	15	8	10	14	13	13
8:00	11	41	33	28	57	16	62	34	35
9:00	9	15	26	12	43	21	194	21	46
10:00	11	18	14	16	18	50	67	15	28
11:00	14	16	17	12	12	38	20	14	18
12:00	11	20	22	14	13	24	24	16	18
13:00	12	16	13	18	15	18	14	15	15
14:00	12	42	21	13	26	16	16	23	21
15:00	15	25	55	56	49	16	13	40	33
16:00	12	11	20	25	15	22	16	17	17
17:00	12	16	15	15	24	73	10	16	24
18:00	10	15	19	15	19	38	3	16	17
19:00	3	5	17	14	9	14	5	10	10
20:00	5	6	6	8	9	12	5	7	7
21:00	2	6	5	4	7	6	3	5	5
22:00	1	6	2	3	6	8	4	4	4
23:00	2	0	1	5	1	5	1	2	2
Total	169	284	309	286	346	393	487	279	325

Job No	N3325
Client	TTPP
Site	St Andrews Rd - north of Spitfire rd
Location	Varroville
Site No	1
Start Dat	9-Jun-17
Descripti	Volume Summary
Direction	SB

Hour	Day of Week							W'Day	7 Day
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
Starting	12-Jun	13-Jun	14-Jun	15-Jun	9-Jun	10-Jun	11-Jun	Ave	Ave
AM Peak	19	30	29	32	32	19	67	Ave	Ave
PM Peak	15	47	45	63	56	64	202	276	327
0:00	3	0	0	0	0	0	9	1	2
1:00	1	0	0	0	0	2	4	0	1
2:00	1	1	3	0	0	0	5	1	1
3:00	0	0	1	1	1	0	5	1	1
4:00	0	4	3	4	2	1	0	3	2
5:00	2	3	4	4	2	1	0	3	2
6:00	4	8	5	9	5	3	3	6	5
7:00	8	16	10	14	18	7	6	13	11
8:00	10	30	27	32	27	12	22	25	23
9:00	19	20	29	15	26	19	67	22	28
10:00	13	22	23	7	16	15	31	16	18
11:00	14	16	20	13	32	16	51	19	23
12:00	12	18	14	13	13	16	202	14	41
13:00	13	13	17	18	12	24	34	15	19
14:00	9	47	17	16	49	23	21	28	26
15:00	11	30	45	63	56	53	18	41	39
16:00	15	10	18	21	18	41	12	16	19
17:00	11	11	19	17	15	27	9	15	16
18:00	7	13	11	8	11	31	5	10	12
19:00	9	4	12	14	12	64	5	10	17
20:00	5	6	12	8	7	10	6	8	8
21:00	2	3	10	3	13	3	1	6	5
22:00	2	3	1	4	3	13	3	3	4
23:00	1	1	0	4	2	7	0	2	2
Total	172	279	301	288	340	388	519	276	327

Job No	N3325
Client	TTPP
Site	St Andrews Rd - north of Spitfire rd
Location	Varroville
Site No	1
Start Dat	9-Jun-17
Descripti	Volume Summary
Direction	Combined

Hour	Day of Week							W'Day	7 Day
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
Starting	12-Jun	13-Jun	14-Jun	15-Jun	9-Jun	10-Jun	11-Jun	Ave	Ave
AM Peak	28	71	60	60	84	65	261	Ave	Ave
PM Peak	27	89	100	119	105	100	226	555	652
0:00	5	1	1	1	0	0	15	2	3
1:00	5	1	1	2	0	6	7	2	3
2:00	1	1	5	0	0	0	9	1	2
3:00	0	0	2	1	2	0	6	1	2
4:00	0	5	3	5	4	1	1	3	3
5:00	3	3	6	5	2	1	0	4	3
6:00	12	14	7	17	17	5	4	13	11
7:00	20	33	24	29	26	17	20	26	24
8:00	21	71	60	60	84	28	84	59	58
9:00	28	35	55	27	69	40	261	43	74
10:00	24	40	37	23	34	65	98	32	46
11:00	28	32	37	25	44	54	71	33	42
12:00	23	38	36	27	26	40	226	30	59
13:00	25	29	30	36	27	42	48	29	34
14:00	21	89	38	29	75	39	37	50	47
15:00	26	55	100	119	105	69	31	81	72
16:00	27	21	38	46	33	63	28	33	37
17:00	23	27	34	32	39	100	19	31	39
18:00	17	28	30	23	30	69	8	26	29
19:00	12	9	29	28	21	78	10	20	27
20:00	10	12	18	16	16	22	11	14	15
21:00	4	9	15	7	20	9	4	11	10
22:00	3	9	3	7	9	21	7	6	8
23:00	3	1	1	9	3	12	1	3	4
Total	341	563	610	574	686	781	1006	555	652

Client	TTPP
Site	Rookwood - all access points
Location	Rookwood
Site No	2
Start Dat	9-Jun-17
Descripti	Volume Summary
Direction	INBOUND

Hour	Day of Week								
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
Starting	12-Jun	13-Jun	14-Jun	15-Jun	9-Jun	10-Jun	11-Jun	W'Day	7 Day
0:00	0	0	2	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	3	5	3	3	3	3	2	3	3
5:00	2	9	11	10	15	2	4	9	8
6:00	7	56	44	58	43	6	8	42	32
7:00	12	49	46	57	60	25	24	45	39
8:00	43	60	65	86	68	53	92	64	67
9:00	83	49	87	118	163	71	159	100	104
10:00	131	59	124	250	188	109	238	150	157
11:00	176	67	196	186	213	152	346	168	191
12:00	167	105	217	238	284	197	267	202	211
13:00	165	141	174	239	439	134	186	232	211
14:00	166	127	100	146	166	117	177	141	143
15:00	140	144	65	87	178	89	108	123	116
16:00	83	142	51	78	74	52	70	86	79
17:00	11	28	29	32	25	14	20	25	23
18:00	4	7	9	6	6	2	4	6	5
19:00	4	4	4	6	3	3	3	4	4
20:00	2	0	1	0	0	0	0	1	0
21:00	0	2	1	2	1	2	3	1	2
22:00	0	0	2	0	0	0	0	0	0
23:00	0	0	2	0	0	0	0	0	0
Total	1199	1054	1233	1602	1929	1031	1711	1403	1394

Client	TTPP
Site	Rookwood - all access points
Location	Rookwood
Site No	2
Start Dat	9-Jun-17
Descripti	Volume Summary
Direction	OUTBOUND

Hour	Day of Week								
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
Starting	12-Jun	13-Jun	14-Jun	15-Jun	9-Jun	10-Jun	11-Jun	W'Day	7 Day
0:00	0	0	2	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	3	5	3	3	3	3	2	3	3
5:00	2	4	8	5	6	1	3	5	4
6:00	5	33	21	29	27	5	4	23	18
7:00	9	28	39	36	38	19	15	30	26
8:00	29	59	59	76	53	44	68	55	55
9:00	78	56	79	97	93	70	139	81	87
10:00	123	70	118	175	109	88	193	119	125
11:00	153	81	145	216	229	145	312	165	183
12:00	163	95	168	208	234	149	328	174	192
13:00	166	183	241	247	305	191	173	228	215
14:00	173	154	147	199	273	124	198	189	181
15:00	143	203	105	149	278	108	121	176	158
16:00	105	105	65	103	158	53	90	107	97
17:00	23	35	34	36	28	20	30	31	29
18:00	5	10	11	7	10	3	7	9	8
19:00	4	3	4	8	3	4	4	4	4
20:00	2	0	0	0	0	0	0	0	0
21:00	0	2	3	2	2	3	2	2	2
22:00	0	0	1	0	0	0	0	0	0
23:00	0	0	2	0	0	0	0	0	0
Total	1186	1126	1255	1596	1849	1030	1689	1402	1390

Client	TTPP
Site	Rookwood - all access points
Location	Rookwood
Site No	2
Start Dat	9-Jun-17
Descripti	Volume Summary
Direction	TWO-WAY

Hour	Day of Week							Ave	Ave
	Mon	Tue	Wed	Thu	Fri	Sat	Sun		
Starting	12-Jun	13-Jun	14-Jun	15-Jun	9-Jun	10-Jun	11-Jun	W'Day	7 Day
0:00	0	0	4	0	0	0	0	1	1
1:00	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0
4:00	6	10	6	6	6	6	4	7	6
5:00	4	13	19	15	21	3	7	14	12
6:00	12	89	65	87	70	11	12	65	49
7:00	21	77	85	93	98	44	39	75	65
8:00	72	119	124	162	121	97	160	120	122
9:00	161	105	166	215	256	141	298	181	192
10:00	254	129	242	425	297	197	431	269	282
11:00	329	148	341	402	442	297	658	332	374
12:00	330	200	385	446	518	346	595	376	403
13:00	331	324	415	486	744	325	359	460	426
14:00	339	281	247	345	439	241	375	330	324
15:00	283	347	170	236	456	197	229	298	274
16:00	188	247	116	181	232	105	160	193	176
17:00	34	63	63	68	53	34	50	56	52
18:00	9	17	20	13	16	5	11	15	13
19:00	8	7	8	14	6	7	7	9	8
20:00	4	0	1	0	0	0	0	1	1
21:00	0	4	4	4	3	5	5	3	4
22:00	0	0	3	0	0	0	0	1	0
23:00	0	0	4	0	0	0	0	1	1
Total	2385	2180	2488	3198	3778	2061	3400	2806	2784

Appendix E

SIDRA Intersection Model Outputs

MOVEMENT SUMMARY

Site: 101 [EXAM_Proposed Site Access]

Network: N101 [Ex AM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Park Road (East)													
5	T1	143	20.6	143	20.6	0.083	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		143	20.6	143	20.6	0.083	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: Park Road (West)													
11	T1	429	7.1	429	7.1	0.230	0.0	LOS A	0.0	0.0	0.00	0.00	59.9
Approach		429	7.1	429	7.1	0.230	0.0	NA	0.0	0.0	0.00	0.00	59.9
All Vehicles		573	10.5	573	10.5	0.230	0.0	NA	0.0	0.0	0.00	0.00	60.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXAM_ Panthers / Park Road]

Network: N101 [Ex AM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Access													
1	L2	1	0.0	1	0.0	0.004	5.9	LOS A	0.0	0.1	0.35	0.57	48.3
2	T1	1	0.0	1	0.0	0.004	7.2	LOS A	0.0	0.1	0.35	0.57	52.4
3	R2	1	0.0	1	0.0	0.004	9.2	LOS A	0.0	0.1	0.35	0.57	48.3
Approach		3	0.0	3	0.0	0.004	7.5	LOS A	0.0	0.1	0.35	0.57	50.2
East: Park Road (East)													
4	L2	1	0.0	1	0.0	0.084	7.3	LOS A	0.1	0.9	0.10	0.06	57.4
5	T1	129	22.8	129	22.8	0.084	0.2	LOS A	0.1	0.9	0.10	0.06	58.0
6	R2	12	0.0	12	0.0	0.084	7.3	LOS A	0.1	0.9	0.10	0.06	56.9
Approach		142	20.7	142	20.7	0.084	0.9	NA	0.1	0.9	0.10	0.06	57.8
North: Panthers Gold Club													
7	L2	1	0.0	1	0.0	0.004	7.0	LOS A	0.0	0.1	0.49	0.61	47.8
8	T1	1	0.0	1	0.0	0.004	7.2	LOS A	0.0	0.1	0.49	0.61	52.1
9	R2	1	0.0	1	0.0	0.004	9.2	LOS A	0.0	0.1	0.49	0.61	47.8
Approach		3	0.0	3	0.0	0.004	7.8	LOS A	0.0	0.1	0.49	0.61	49.9
West: Park Road (west)													
10	L2	11	0.0	11	0.0	0.228	5.6	LOS A	0.0	0.1	0.00	0.02	57.1
11	T1	429	7.1	429	7.1	0.228	0.0	LOS A	0.0	0.1	0.00	0.02	58.6
12	R2	1	0.0	1	0.0	0.228	6.0	LOS A	0.0	0.1	0.00	0.02	56.4
Approach		441	6.9	441	6.9	0.228	0.1	NA	0.0	0.1	0.00	0.02	58.4
All Vehicles		589	10.2	589	10.2	0.228	0.4	NA	0.1	0.9	0.03	0.03	57.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXAM_Greendale Rd/Park Rd]

Network: N101 [Ex AM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Greendale Rd-S													
1a	L1	86	8.5	86	8.5	0.062	4.6	LOS A	0.3	1.9	0.24	0.51	44.0
3	R2	37	11.4	37	11.4	0.058	7.9	LOS A	0.2	1.4	0.49	0.72	41.2
Approach		123	9.4	123	9.4	0.062	5.6	LOS A	0.3	1.9	0.32	0.57	43.2
East: Park Rd-E													
4	L2	11	30.0	11	30.0	0.083	5.7	LOS A	0.0	0.0	0.00	0.56	49.2
6a	R1	127	19.8	127	19.8	0.083	4.8	LOS A	0.0	0.0	0.00	0.56	35.5
Approach		138	20.6	138	20.6	0.083	4.9	NA	0.0	0.0	0.00	0.56	38.8
NorthWest: Park Rd-NW													
27a	L1	399	8.4	399	8.4	0.221	4.3	LOS A	0.0	0.0	0.00	0.57	30.7
29a	R1	48	19.6	48	19.6	0.054	4.8	LOS A	0.2	1.5	0.31	0.57	44.2
Approach		447	9.6	447	9.6	0.221	4.4	LOS A	0.2	1.5	0.03	0.57	36.0
All Vehicles		708	11.7	708	11.7	0.221	4.7	NA	0.3	1.9	0.08	0.57	39.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXAM_ Roundabout]

Network: N101 [Ex AM Network]

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Park Rd-S													
1	L2	109	22.1	109	22.1	0.230	4.4	LOS A	1.2	9.9	0.36	0.52	49.4
2	T1	99	9.6	99	9.6	0.230	4.6	LOS A	1.2	9.9	0.36	0.52	52.0
3u	U	1	0.0	1	0.0	0.230	9.9	LOS A	1.2	9.9	0.36	0.52	30.3
Approach		209	16.1	209	16.1	0.230	4.5	LOS A	1.2	9.9	0.36	0.52	50.5
North: Park Rd-N													
8	T1	80	9.2	80	9.2	0.237	7.3	LOS A	1.4	10.3	0.59	0.72	46.1
9	R2	117	10.8	117	10.8	0.237	11.1	LOS A	1.4	10.3	0.59	0.72	51.1
9u	U	2	0.0	2	0.0	0.237	12.5	LOS A	1.4	10.3	0.59	0.72	52.2
Approach		199	10.1	199	10.1	0.237	9.6	LOS A	1.4	10.3	0.59	0.72	49.7
West: Silverdale Rd-W													
10	L2	387	4.1	387	4.1	0.576	5.1	LOS A	4.4	31.9	0.38	0.59	52.0
12	R2	375	6.5	375	6.5	0.576	9.0	LOS A	4.4	31.9	0.38	0.59	48.2
Approach		762	5.2	762	5.2	0.576	7.0	LOS A	4.4	31.9	0.38	0.59	50.7
All Vehicles		1171	8.0	1171	8.0	0.576	7.0	LOS A	4.4	31.9	0.41	0.60	50.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXPM_Proposed Site Access]

Network: N101 [Ex PM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Park Road (East)													
5	T1	394	11.8	394	11.8	0.217	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		394	11.8	394	11.8	0.217	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: Park Road (West)													
11	T1	229	13.3	229	13.3	0.128	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		229	13.3	229	13.3	0.128	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		623	12.3	623	12.3	0.217	0.0	NA	0.0	0.0	0.00	0.00	60.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXPM_ Panthers / Park Road]

Network: N101 [Ex PM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Access													
1	L2	1	0.0	1	0.0	0.004	6.7	LOS A	0.0	0.1	0.47	0.60	47.9
2	T1	1	0.0	1	0.0	0.004	7.3	LOS A	0.0	0.1	0.47	0.60	52.1
3	R2	1	0.0	1	0.0	0.004	9.3	LOS A	0.0	0.1	0.47	0.60	47.9
Approach		3	0.0	3	0.0	0.004	7.8	LOS A	0.0	0.1	0.47	0.60	49.9
East: Park Road (East)													
4	L2	1	0.0	1	0.0	0.191	6.5	LOS A	0.1	0.6	0.02	0.02	58.1
5	T1	344	13.5	344	13.5	0.191	0.0	LOS A	0.1	0.6	0.02	0.02	59.5
6	R2	8	0.0	8	0.0	0.191	6.5	LOS A	0.1	0.6	0.02	0.02	57.6
Approach		354	13.1	354	13.1	0.191	0.2	NA	0.1	0.6	0.02	0.02	59.4
North: Panthers Gold Club													
7	L2	9	0.0	9	0.0	0.039	6.3	LOS A	0.1	0.9	0.43	0.67	47.2
8	T1	1	0.0	1	0.0	0.039	7.5	LOS A	0.1	0.9	0.43	0.67	51.7
9	R2	17	0.0	17	0.0	0.039	9.5	LOS A	0.1	0.9	0.43	0.67	47.2
Approach		27	0.0	27	0.0	0.039	8.3	LOS A	0.1	0.9	0.43	0.67	47.5
West: Park Road (west)													
10	L2	5	0.0	5	0.0	0.127	5.8	LOS A	0.0	0.1	0.01	0.02	57.1
11	T1	229	13.3	229	13.3	0.127	0.0	LOS A	0.0	0.1	0.01	0.02	58.3
12	R2	1	0.0	1	0.0	0.127	6.9	LOS A	0.0	0.1	0.01	0.02	56.3
Approach		236	12.9	236	12.9	0.127	0.2	NA	0.0	0.1	0.01	0.02	58.1
All Vehicles		620	12.4	620	12.4	0.191	0.6	NA	0.1	0.9	0.04	0.05	58.2

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXPM_Greendale Rd/Park Rd]

Network: N101 [Ex PM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Greendale Rd-S													
1a	L1	75	11.3	75	11.3	0.067	5.5	LOS A	0.3	2.0	0.40	0.59	43.4
3	R2	27	23.1	27	23.1	0.047	8.4	LOS A	0.1	1.3	0.50	0.72	40.9
Approach		102	14.4	102	14.4	0.067	6.3	LOS A	0.3	2.0	0.42	0.62	42.7
East: Park Rd-E													
4	L2	41	10.3	41	10.3	0.201	5.6	LOS A	0.0	0.0	0.00	0.56	50.3
6a	R1	313	12.1	313	12.1	0.201	4.8	LOS A	0.0	0.0	0.00	0.56	35.4
Approach		354	11.9	354	11.9	0.201	4.9	NA	0.0	0.0	0.00	0.56	40.3
NorthWest: Park Rd-NW													
27a	L1	203	12.4	203	12.4	0.115	4.3	LOS A	0.0	0.0	0.00	0.57	30.7
29a	R1	116	5.5	116	5.5	0.150	6.1	LOS A	0.5	3.8	0.45	0.70	43.3
Approach		319	9.9	319	9.9	0.150	5.0	LOS A	0.5	3.8	0.16	0.62	40.2
All Vehicles		775	11.4	775	11.4	0.201	5.1	NA	0.5	3.8	0.12	0.59	40.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXPM_ Roundabout]

Network: N101 [Ex PM Network]

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: RoadName													
1	L2	293	14.0	293	14.0	0.575	8.8	LOS A	4.5	35.2	0.74	0.86	45.5
2	T1	108	9.7	108	9.7	0.575	9.0	LOS A	4.5	35.2	0.74	0.86	47.2
3u	U	2	0.0	2	0.0	0.575	14.0	LOS A	4.5	35.2	0.74	0.86	21.1
Approach		403	12.8	403	12.8	0.575	8.9	LOS A	4.5	35.2	0.74	0.86	45.9
North: RoadName													
8	T1	141	9.0	141	9.0	0.445	5.9	LOS A	3.2	23.9	0.47	0.63	46.7
9	R2	359	5.9	359	5.9	0.445	9.6	LOS A	3.2	23.9	0.47	0.63	51.7
9u	U	5	0.0	5	0.0	0.445	11.2	LOS A	3.2	23.9	0.47	0.63	52.6
Approach		505	6.7	505	6.7	0.445	8.6	LOS A	3.2	23.9	0.47	0.63	50.8
West: RoadName													
10	L2	204	7.7	204	7.7	0.293	5.0	LOS A	1.6	12.6	0.32	0.58	52.3
12	R2	143	16.2	143	16.2	0.293	9.0	LOS A	1.6	12.6	0.32	0.58	48.9
Approach		347	11.2	347	11.2	0.293	6.7	LOS A	1.6	12.6	0.32	0.58	51.4
All Vehicles		1256	9.9	1256	9.9	0.575	8.1	LOS A	4.5	35.2	0.52	0.69	49.7

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXSUN_Proposed Site Access]

Network: N101 [Ex SUN Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Park Road (East)													
5	T1	244	1.7	244	1.7	0.127	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		244	1.7	244	1.7	0.127	0.0	NA	0.0	0.0	0.00	0.00	60.0
West: Park Road (West)													
11	T1	189	2.2	189	2.2	0.099	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
Approach		189	2.2	189	2.2	0.099	0.0	NA	0.0	0.0	0.00	0.00	60.0
All Vehicles		434	1.9	434	1.9	0.127	0.0	NA	0.0	0.0	0.00	0.00	60.0

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXSUN_ Panthers / Park Road]

Network: N101 [Ex SUN Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Garage Access													
1	L2	2	0.0	2	0.0	0.005	5.3	LOS A	0.0	0.1	0.41	0.56	25.9
2	T1	1	0.0	1	0.0	0.005	5.4	LOS A	0.0	0.1	0.41	0.56	49.6
3	R2	1	0.0	1	0.0	0.005	7.2	LOS A	0.0	0.1	0.41	0.56	25.9
Approach		4	0.0	4	0.0	0.005	5.8	LOS A	0.0	0.1	0.41	0.56	39.6
East: Park Road (East)													
4	L2	1	0.0	1	0.0	0.163	6.2	LOS A	0.1	0.6	0.03	0.02	55.5
5	T1	312	1.4	312	1.4	0.163	0.0	LOS A	0.1	0.6	0.03	0.02	59.4
6	R2	9	0.0	9	0.0	0.163	6.2	LOS A	0.1	0.6	0.03	0.02	57.6
Approach		322	1.3	322	1.3	0.163	0.2	NA	0.1	0.6	0.03	0.02	59.3
North: Panthers Gold Club													
7	L2	12	0.0	12	0.0	0.043	6.1	LOS A	0.1	1.0	0.38	0.64	48.0
8	T1	1	0.0	1	0.0	0.043	6.7	LOS A	0.1	1.0	0.38	0.64	46.8
9	R2	21	0.0	21	0.0	0.043	8.6	LOS A	0.1	1.0	0.38	0.64	48.0
Approach		34	0.0	34	0.0	0.043	7.7	LOS A	0.1	1.0	0.38	0.64	47.9
West: Park Road (west)													
10	L2	9	0.0	9	0.0	0.101	5.7	LOS A	0.0	0.1	0.01	0.03	56.9
11	T1	189	2.2	189	2.2	0.101	0.0	LOS A	0.0	0.1	0.01	0.03	57.3
12	R2	1	0.0	1	0.0	0.101	6.6	LOS A	0.0	0.1	0.01	0.03	46.4
Approach		200	2.1	200	2.1	0.101	0.3	NA	0.0	0.1	0.01	0.03	57.1
All Vehicles		560	1.5	560	1.5	0.163	0.8	NA	0.1	1.0	0.04	0.07	57.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXSUN_Greendale Rd/Park Rd]

Network: N101 [Ex SUN Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Greendale Rd-S													
1a	L1	97	0.0	97	0.0	0.071	4.8	LOS A	0.3	2.0	0.30	0.53	43.8
3	R2	34	3.1	34	3.1	0.041	6.5	LOS A	0.1	1.0	0.41	0.64	42.5
Approach		131	0.8	131	0.8	0.071	5.2	LOS A	0.3	2.0	0.33	0.56	43.5
East: Park Rd-E													
4	L2	54	0.0	54	0.0	0.142	5.5	LOS A	0.0	0.0	0.00	0.56	50.9
6a	R1	213	3.0	213	3.0	0.142	4.7	LOS A	0.0	0.0	0.00	0.56	35.2
Approach		266	2.4	266	2.4	0.142	4.9	NA	0.0	0.0	0.00	0.56	42.8
NorthWest: Park Rd-NW													
27a	L1	169	1.2	169	1.2	0.089	4.3	LOS A	0.0	0.0	0.00	0.57	30.7
29a	R1	98	1.1	98	1.1	0.111	5.3	LOS A	0.4	2.7	0.39	0.64	44.1
Approach		267	1.2	267	1.2	0.111	4.7	LOS A	0.4	2.7	0.14	0.60	40.8
All Vehicles		664	1.6	664	1.6	0.142	4.9	NA	0.4	2.7	0.12	0.58	42.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [EXSUN_ Roundabout]

Network: N101 [Ex SUN Network]

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Park Rd-S													
1	L2	209	1.0	209	1.0	0.425	5.7	LOS A	2.6	18.2	0.57	0.67	49.3
2	T1	143	1.5	143	1.5	0.425	6.0	LOS A	2.6	18.2	0.57	0.67	51.0
3u	U	4	0.0	4	0.0	0.425	11.4	LOS A	2.6	18.2	0.57	0.67	27.0
Approach		357	1.2	357	1.2	0.425	5.9	LOS A	2.6	18.2	0.57	0.67	49.9
North: Park Rd-N													
8	T1	112	0.9	112	0.9	0.326	5.5	LOS A	2.1	14.9	0.38	0.61	47.1
9	R2	261	1.2	261	1.2	0.326	9.1	LOS A	2.1	14.9	0.38	0.61	52.2
9u	U	13	8.3	13	8.3	0.326	11.1	LOS A	2.1	14.9	0.38	0.61	52.5
Approach		385	1.4	385	1.4	0.326	8.1	LOS A	2.1	14.9	0.38	0.61	51.2
West: Silverdale Rd-W													
10	L2	247	1.7	247	1.7	0.313	5.1	LOS A	1.7	12.2	0.36	0.60	52.6
12	R2	127	3.3	127	3.3	0.313	9.0	LOS A	1.7	12.2	0.36	0.60	49.0
Approach		375	2.2	375	2.2	0.313	6.4	LOS A	1.7	12.2	0.36	0.60	51.8
All Vehicles		1117	1.6	1117	1.6	0.425	6.9	LOS A	2.6	18.2	0.43	0.63	51.1

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPAM_Proposed Site Access]

Network: N101 [Fu AM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Park Road (East)													
5	T1	143	20.6	143	20.6	0.083	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6b	R3	49	0.0	49	0.0	0.045	7.8	LOS A	0.2	1.3	0.49	0.69	51.3
Approach		193	15.3	193	15.3	0.083	2.0	NA	0.2	1.3	0.13	0.18	56.1
NorthEast: Cemetery Access													
24b	L3	43	0.0	43	0.0	0.078	8.1	LOS A	0.3	2.0	0.51	0.72	51.5
26a	R1	19	0.0	19	0.0	0.078	10.5	LOS A	0.3	2.0	0.51	0.72	46.7
Approach		62	0.0	62	0.0	0.078	8.8	LOS A	0.3	2.0	0.51	0.72	50.6
West: Park Road (West)													
10a	L1	36	0.0	36	0.0	0.249	5.3	LOS A	0.0	0.0	0.00	0.05	57.3
11	T1	429	7.1	429	7.1	0.249	0.0	LOS A	0.0	0.0	0.00	0.05	59.5
Approach		465	6.6	465	6.6	0.249	0.4	NA	0.0	0.0	0.00	0.05	59.3
All Vehicles		720	8.3	720	8.3	0.249	1.6	NA	0.3	2.0	0.08	0.14	57.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPAM_ Panthers / Park Road]

Network: N101 [Fu AM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Access													
1	L2	1	0.0	1	0.0	0.004	6.0	LOS A	0.0	0.1	0.37	0.58	47.9
2	T1	1	0.0	1	0.0	0.004	7.7	LOS A	0.0	0.1	0.37	0.58	52.1
3	R2	1	0.0	1	0.0	0.004	9.7	LOS A	0.0	0.1	0.37	0.58	47.9
Approach		3	0.0	3	0.0	0.004	7.8	LOS A	0.0	0.1	0.37	0.58	49.9
East: Park Road (East)													
4	L2	1	0.0	1	0.0	0.094	7.5	LOS A	0.1	1.0	0.10	0.05	57.5
5	T1	148	19.9	148	19.9	0.094	0.2	LOS A	0.1	1.0	0.10	0.05	58.2
6	R2	12	0.0	12	0.0	0.094	7.5	LOS A	0.1	1.0	0.10	0.05	57.0
Approach		161	18.3	161	18.3	0.094	0.8	NA	0.1	1.0	0.10	0.05	58.0
North: Panthers Gold Club													
7	L2	1	0.0	1	0.0	0.005	7.2	LOS A	0.0	0.1	0.51	0.63	47.4
8	T1	1	0.0	1	0.0	0.005	7.6	LOS A	0.0	0.1	0.51	0.63	51.8
9	R2	1	0.0	1	0.0	0.005	9.8	LOS A	0.0	0.1	0.51	0.63	47.4
Approach		3	0.0	3	0.0	0.005	8.2	LOS A	0.0	0.1	0.51	0.63	49.5
West: Park Road (west)													
10	L2	11	0.0	11	0.0	0.246	5.6	LOS A	0.0	0.1	0.00	0.01	57.1
11	T1	465	6.6	465	6.6	0.246	0.0	LOS A	0.0	0.1	0.00	0.01	58.7
12	R2	1	0.0	1	0.0	0.246	6.1	LOS A	0.0	0.1	0.00	0.01	56.4
Approach		477	6.4	477	6.4	0.246	0.1	NA	0.0	0.1	0.00	0.01	58.5
All Vehicles		644	9.3	644	9.3	0.246	0.4	NA	0.1	1.0	0.03	0.03	57.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPAM_Greendale Rd/Park Rd]

Network: N101 [Fu AM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Greendale Rd-S													
1a	L1	86	8.5	86	8.5	0.063	4.7	LOS A	0.3	1.9	0.26	0.52	44.0
3	R2	37	11.4	37	11.4	0.062	8.4	LOS A	0.2	1.5	0.51	0.75	40.8
Approach		123	9.4	123	9.4	0.063	5.8	LOS A	0.3	1.9	0.34	0.59	43.0
East: Park Rd-E													
4	L2	11	30.0	11	30.0	0.093	5.7	LOS A	0.0	0.0	0.00	0.56	49.2
6a	R1	146	17.3	146	17.3	0.093	4.8	LOS A	0.0	0.0	0.00	0.56	35.5
Approach		157	18.1	157	18.1	0.093	4.9	NA	0.0	0.0	0.00	0.56	38.5
NorthWest: Park Rd-NW													
27a	L1	435	7.7	435	7.7	0.240	4.3	LOS A	0.0	0.0	0.00	0.57	30.7
29a	R1	48	19.6	48	19.6	0.055	4.9	LOS A	0.2	1.5	0.33	0.58	44.1
Approach		483	8.9	483	8.9	0.240	4.4	LOS A	0.2	1.5	0.03	0.57	35.7
All Vehicles		763	10.9	763	10.9	0.240	4.7	NA	0.3	1.9	0.07	0.57	38.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPAM_ Roundabout]

Network: N101 [Fu AM Network]

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Park Rd-S													
1	L2	116	20.9	116	20.9	0.247	4.4	LOS A	1.4	10.8	0.36	0.52	49.4
2	T1	112	8.5	112	8.5	0.247	4.6	LOS A	1.4	10.8	0.36	0.52	52.0
3u	U	1	0.0	1	0.0	0.247	9.9	LOS A	1.4	10.8	0.36	0.52	30.2
Approach		228	14.7	228	14.7	0.247	4.5	LOS A	1.4	10.8	0.36	0.52	50.6
North: Park Rd-N													
8	T1	87	8.4	87	8.4	0.253	7.6	LOS A	1.5	11.2	0.62	0.74	45.9
9	R2	117	10.8	117	10.8	0.253	11.3	LOS A	1.5	11.2	0.62	0.74	51.0
9u	U	2	0.0	2	0.0	0.253	12.8	LOS A	1.5	11.2	0.62	0.74	52.1
Approach		206	9.7	206	9.7	0.253	9.8	LOS A	1.5	11.2	0.62	0.74	49.5
West: Silverdale Rd-W													
10	L2	387	4.1	387	4.1	0.606	5.2	LOS A	4.8	35.0	0.42	0.60	51.8
12	R2	403	6.0	403	6.0	0.606	9.1	LOS A	4.8	35.0	0.42	0.60	48.0
Approach		791	5.1	791	5.1	0.606	7.2	LOS A	4.8	35.0	0.42	0.60	50.4
All Vehicles		1225	7.6	1225	7.6	0.606	7.1	LOS A	4.8	35.0	0.44	0.61	50.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPPM_Proposed Site Access]

Network: N101 [Fu PM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles													
Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Park Road (East)													
5	T1	394	11.8	394	11.8	0.217	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6b	R3	49	0.0	49	0.0	0.035	6.9	LOS A	0.2	1.1	0.36	0.62	51.7
Approach		443	10.5	443	10.5	0.217	0.8	NA	0.2	1.1	0.04	0.07	58.1
NorthEast: Cemetery Access													
24b	L3	44	0.0	44	0.0	0.095	7.3	LOS A	0.4	2.5	0.43	0.67	51.5
26a	R1	29	0.0	29	0.0	0.095	11.2	LOS A	0.4	2.5	0.43	0.67	46.7
Approach		74	0.0	74	0.0	0.095	8.8	LOS A	0.4	2.5	0.43	0.67	50.2
West: Park Road (West)													
10a	L1	24	0.0	24	0.0	0.141	5.3	LOS A	0.0	0.0	0.00	0.06	57.2
11	T1	229	13.3	229	13.3	0.141	0.0	LOS A	0.0	0.0	0.00	0.06	59.4
Approach		254	12.0	254	12.0	0.141	0.5	NA	0.0	0.0	0.00	0.06	59.2
All Vehicles		771	10.0	771	10.0	0.217	1.5	NA	0.4	2.5	0.06	0.12	57.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPPM_ Panthers / Park Road]

Network: N101 [Fu PM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	Demand Flows HV	Arrival Flows Total	Arrival Flows HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	95% Back of Queue Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Access													
1	L2	1	0.0	1	0.0	0.005	6.8	LOS A	0.0	0.1	0.49	0.62	47.5
2	T1	1	0.0	1	0.0	0.005	7.7	LOS A	0.0	0.1	0.49	0.62	51.9
3	R2	1	0.0	1	0.0	0.005	9.9	LOS A	0.0	0.1	0.49	0.62	47.5
Approach		3	0.0	3	0.0	0.005	8.1	LOS A	0.0	0.1	0.49	0.62	49.5
East: Park Road (East)													
4	L2	1	0.0	1	0.0	0.206	6.6	LOS A	0.1	0.6	0.02	0.02	58.1
5	T1	374	12.4	374	12.4	0.206	0.0	LOS A	0.1	0.6	0.02	0.02	59.5
6	R2	8	0.0	8	0.0	0.206	6.6	LOS A	0.1	0.6	0.02	0.02	57.6
Approach		383	12.1	383	12.1	0.206	0.2	NA	0.1	0.6	0.02	0.02	59.4
North: Panthers Gold Club													
7	L2	9	0.0	9	0.0	0.042	6.4	LOS A	0.1	1.0	0.46	0.69	46.7
8	T1	1	0.0	1	0.0	0.042	7.9	LOS A	0.1	1.0	0.46	0.69	51.4
9	R2	17	0.0	17	0.0	0.042	10.1	LOS A	0.1	1.0	0.46	0.69	46.7
Approach		27	0.0	27	0.0	0.042	8.7	LOS A	0.1	1.0	0.46	0.69	47.0
West: Park Road (west)													
10	L2	5	0.0	5	0.0	0.139	5.9	LOS A	0.0	0.1	0.01	0.01	57.1
11	T1	254	12.0	254	12.0	0.139	0.0	LOS A	0.0	0.1	0.01	0.01	58.5
12	R2	1	0.0	1	0.0	0.139	7.1	LOS A	0.0	0.1	0.01	0.01	56.3
Approach		260	11.7	260	11.7	0.139	0.2	NA	0.0	0.1	0.01	0.01	58.3
All Vehicles		674	11.4	674	11.4	0.206	0.6	NA	0.1	1.0	0.04	0.04	58.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPPM_Greendale Rd/Park Rd]

Network: N101 [Fu PM Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Greendale Rd-S													
1a	L1	75	11.3	75	11.3	0.069	5.6	LOS A	0.3	2.1	0.41	0.60	43.4
3	R2	27	23.1	27	23.1	0.051	9.0	LOS A	0.2	1.3	0.53	0.75	40.4
Approach		102	14.4	102	14.4	0.069	6.5	LOS A	0.3	2.1	0.44	0.64	42.5
East: Park Rd-E													
4	L2	41	10.3	41	10.3	0.217	5.6	LOS A	0.0	0.0	0.00	0.56	50.3
6a	R1	342	11.1	342	11.1	0.217	4.8	LOS A	0.0	0.0	0.00	0.56	35.4
Approach		383	11.0	383	11.0	0.217	4.9	NA	0.0	0.0	0.00	0.56	40.0
NorthWest: Park Rd-NW													
27a	L1	227	11.1	227	11.1	0.128	4.3	LOS A	0.0	0.0	0.00	0.57	30.7
29a	R1	116	5.5	116	5.5	0.155	6.3	LOS A	0.5	3.9	0.47	0.72	43.1
Approach		343	9.2	343	9.2	0.155	5.0	LOS A	0.5	3.9	0.16	0.62	39.8
All Vehicles		828	10.7	828	10.7	0.217	5.1	NA	0.5	3.9	0.12	0.60	40.6

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPPM_ Roundabout]

Network: N101 [Fu PM Network]

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: RoadName													
1	L2	313	13.1	313	13.1	0.613	9.4	LOS A	5.2	40.3	0.77	0.89	45.0
2	T1	118	8.9	118	8.9	0.613	9.5	LOS A	5.2	40.3	0.77	0.89	46.7
3u	U	2	0.0	2	0.0	0.613	14.6	LOS B	5.2	40.3	0.77	0.89	20.3
Approach		433	11.9	433	11.9	0.613	9.4	LOS A	5.2	40.3	0.77	0.89	45.4
North: RoadName													
8	T1	156	8.1	156	8.1	0.464	6.0	LOS A	3.4	25.4	0.50	0.64	46.6
9	R2	359	5.9	359	5.9	0.464	9.7	LOS A	3.4	25.4	0.50	0.64	51.7
9u	U	5	0.0	5	0.0	0.464	11.3	LOS A	3.4	25.4	0.50	0.64	52.6
Approach		520	6.5	520	6.5	0.464	8.6	LOS A	3.4	25.4	0.50	0.64	50.7
West: RoadName													
10	L2	204	7.7	204	7.7	0.304	5.1	LOS A	1.7	13.3	0.34	0.59	52.2
12	R2	154	15.1	154	15.1	0.304	9.0	LOS A	1.7	13.3	0.34	0.59	48.7
Approach		358	10.9	358	10.9	0.304	6.8	LOS A	1.7	13.3	0.34	0.59	51.2
All Vehicles		1311	9.5	1311	9.5	0.613	8.4	LOS A	5.2	40.3	0.54	0.71	49.4

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPSUN_Proposed Site Access]

Network: N101 [Fu SUN Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
East: Park Road (East)													
5	T1	244	1.7	244	1.7	0.127	0.0	LOS A	0.0	0.0	0.00	0.00	60.0
6b	R3	76	0.0	76	0.0	0.052	6.8	LOS A	0.2	1.6	0.34	0.61	51.8
Approach		320	1.3	320	1.3	0.127	1.6	NA	0.2	1.6	0.08	0.15	56.6
NorthEast: Cemetery Access													
24b	L3	38	0.0	38	0.0	0.139	7.1	LOS A	0.5	3.8	0.43	0.68	51.9
26a	R1	71	0.0	71	0.0	0.139	8.9	LOS A	0.5	3.8	0.43	0.68	47.3
Approach		108	0.0	108	0.0	0.139	8.3	LOS A	0.5	3.8	0.43	0.68	49.6
West: Park Road (West)													
10a	L1	46	0.0	46	0.0	0.123	5.3	LOS A	0.0	0.0	0.00	0.12	56.8
11	T1	189	2.2	189	2.2	0.123	0.0	LOS A	0.0	0.0	0.00	0.12	58.9
Approach		236	1.8	236	1.8	0.123	1.1	NA	0.0	0.0	0.00	0.12	58.5
All Vehicles		664	1.3	664	1.3	0.139	2.5	NA	0.5	3.8	0.11	0.22	56.3

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPSUN_ Panthers / Park Road]

Network: N101 [Fu SUN Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Garage Access													
1	L2	2	0.0	2	0.0	0.005	5.4	LOS A	0.0	0.1	0.44	0.58	24.7
2	T1	1	0.0	1	0.0	0.005	6.3	LOS A	0.0	0.1	0.44	0.58	49.0
3	R2	1	0.0	1	0.0	0.005	8.3	LOS A	0.0	0.1	0.44	0.58	24.7
Approach		4	0.0	4	0.0	0.005	6.3	LOS A	0.0	0.1	0.44	0.58	38.4
East: Park Road (East)													
4	L2	1	0.0	1	0.0	0.207	6.5	LOS A	0.4	3.1	0.12	0.08	54.0
5	T1	340	1.2	340	1.2	0.207	0.2	LOS A	0.4	3.1	0.12	0.08	57.6
6	R2	52	0.0	52	0.0	0.207	6.5	LOS A	0.4	3.1	0.12	0.08	56.7
Approach		393	1.1	393	1.1	0.207	1.0	NA	0.4	3.1	0.12	0.08	57.4
North: Panthers Gold Club													
7	L2	12	0.0	12	0.0	0.049	6.3	LOS A	0.2	1.2	0.43	0.68	47.0
8	T1	1	0.0	1	0.0	0.049	7.6	LOS A	0.2	1.2	0.43	0.68	46.0
9	R2	21	0.0	21	0.0	0.049	9.7	LOS A	0.2	1.2	0.43	0.68	47.0
Approach		34	0.0	34	0.0	0.049	8.5	LOS A	0.2	1.2	0.43	0.68	47.0
West: Park Road (west)													
10	L2	9	0.0	9	0.0	0.124	5.7	LOS A	0.0	0.1	0.01	0.03	57.0
11	T1	236	1.8	236	1.8	0.124	0.0	LOS A	0.0	0.1	0.01	0.03	57.7
12	R2	1	0.0	1	0.0	0.124	6.8	LOS A	0.0	0.1	0.01	0.03	46.6
Approach		246	1.7	246	1.7	0.124	0.3	NA	0.0	0.1	0.01	0.03	57.5
All Vehicles		677	1.2	677	1.2	0.207	1.2	NA	0.4	3.1	0.10	0.09	56.5

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPSUN_Greendale Rd/Park Rd]

Network: N101 [Fu SUN Network]

New Site
Giveway / Yield (Two-Way)

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Greendale Rd-S													
1a	L1	97	0.0	97	0.0	0.073	4.9	LOS A	0.3	2.1	0.33	0.55	43.7
3	R2	34	3.1	34	3.1	0.045	6.9	LOS A	0.1	1.0	0.44	0.67	42.1
Approach		131	0.8	131	0.8	0.073	5.4	LOS A	0.3	2.1	0.36	0.58	43.3
East: Park Rd-E													
4	L2	54	0.0	54	0.0	0.157	5.5	LOS A	0.0	0.0	0.00	0.56	50.9
6a	R1	241	2.6	241	2.6	0.157	4.7	LOS A	0.0	0.0	0.00	0.56	35.3
Approach		295	2.1	295	2.1	0.157	4.9	NA	0.0	0.0	0.00	0.56	42.3
NorthWest: Park Rd-NW													
27a	L1	216	1.0	216	1.0	0.114	4.3	LOS A	0.0	0.0	0.00	0.57	30.7
29a	R1	98	1.1	98	1.1	0.114	5.5	LOS A	0.4	2.7	0.40	0.65	44.0
Approach		314	1.0	314	1.0	0.114	4.7	LOS A	0.4	2.7	0.13	0.60	40.1
All Vehicles		739	1.4	739	1.4	0.157	4.9	NA	0.4	2.7	0.12	0.58	41.8

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Minor Road Approach LOS values are based on average delay for all vehicle movements.
NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

MOVEMENT SUMMARY

Site: 101 [PROPSUN_ Roundabout]

Network: N101 [Fu SUN Network]

New Site
Roundabout

Movement Performance - Vehicles

Mov ID	OD Mov	Demand Flows Total	HV	Arrival Flows Total	HV	Deg. Satn	Average Delay	Level of Service	95% Back of Queue Vehicles	Distance	Prop. Queued	Effective Stop Rate	Average Speed
		veh/h	%	veh/h	%	v/c	sec		veh	m		per veh	km/h
South: Park Rd-S													
1	L2	224	0.9	224	0.9	0.457	5.8	LOS A	2.9	20.4	0.59	0.68	49.2
2	T1	157	1.3	157	1.3	0.457	6.1	LOS A	2.9	20.4	0.59	0.68	50.9
3u	U	4	0.0	4	0.0	0.457	11.5	LOS A	2.9	20.4	0.59	0.68	26.9
Approach		385	1.1	385	1.1	0.457	6.0	LOS A	2.9	20.4	0.59	0.68	49.8
North: Park Rd-N													
8	T1	135	0.8	135	0.8	0.356	5.7	LOS A	2.4	16.8	0.43	0.62	47.0
9	R2	261	1.2	261	1.2	0.356	9.3	LOS A	2.4	16.8	0.43	0.62	52.1
9u	U	13	8.3	13	8.3	0.356	11.3	LOS A	2.4	16.8	0.43	0.62	52.5
Approach		408	1.3	408	1.3	0.356	8.2	LOS A	2.4	16.8	0.43	0.62	51.0
West: Silverdale Rd-W													
10	L2	247	1.7	247	1.7	0.336	5.2	LOS A	1.9	13.5	0.38	0.61	52.4
12	R2	151	2.8	151	2.8	0.336	9.1	LOS A	1.9	13.5	0.38	0.61	48.7
Approach		398	2.1	398	2.1	0.336	6.7	LOS A	1.9	13.5	0.38	0.61	51.5
All Vehicles		1192	1.5	1192	1.5	0.457	7.0	LOS A	2.9	20.4	0.47	0.64	50.9

Site Level of Service (LOS) Method: Delay (RTA NSW). Site LOS Method is specified in the Network Data dialog (Network tab).
Vehicle movement LOS values are based on average delay per movement.
Intersection and Approach LOS values are based on average delay for all vehicle movements.
Roundabout Capacity Model: SIDRA Standard.
SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.
Largest change in Average Back of Queue or Degree of Saturation for any lane during the last three iterations: 0.0 %
Number of Iterations: 5 (maximum specified: 10)

The Transport Planning Partnership
Suite 402 Level 4, 22 Atchison Street
St Leonards NSW 2065

P.O. Box 237
St Leonards NSW 1590

02 8437 7800

info@ttpp.net.au

www.ttpp.net.au